



University

October University for
Modern Sciences and Arts
Established by Dr. Nawal El Degwi in 1996



**UNIVERSITY of
GREENWICH**

**FACULTY
OF
ENGINEERING**

ACHIEVEMENTS BOOK

2019-2020

The Faculty of Engineering at MSA University aims at promoting each student's capacity, ability, creativity and imagination when approaching future engineering problems. It also aims at increasing the students understanding, awareness and appreciation of the social impact of technology. This will help orient future engineers to lead successful and professional careers worldwide. The Engineering program seeks providing all students with the skills and tools that would facilitate faster advancement into management positions.

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MSA

00 DEAN'S WELCOME

PROF. NAHED SOBHY

Welcome to the Faculty of Engineering at October University for Modern Sciences and Arts. Throughout its rich 25-years history, the Faculty of Engineering established an outstanding regional and national reputation for excellence in graduation projects.

This is due to its talented faculty and staff, its research initiatives, as well as its excellent curricula, its modern facilities and most important, the quality of its graduates. The Faculty of Engineering at October University for Modern Sciences and Arts is in an admirable position having been able to foster tremendously strong relationships with industry partners, alumni and government . The result of these strong relationships can be easily seen in the high quality of our graduation projects.

We believe in our students and we value their success. We are proud of our outstanding faculty and staff, whose cutting edge research is relevant to the needs of the society. Our goal is to give students the opportunity to experience research and hands-on learning starting from the first day they step through our door. Through our program, undergraduate students gain practical experience working with industry, a win-win relationship for both partners and students.

Looking forward, the Faculty of Engineering will make every effort to continue to be known for its high-quality programs, innovation and relevance to industry and society.

*Dean Faculty of Engineering
Head of Industrial Systems Department
Prof. Nahed Sobhy*

MSA

01 HEAD OF QUALITY ASSURANCE 'S WELCOME

PROF . Maysa Omar

The Faculty of Engineering at MSA University seeks to enhance its competitive position among local and regional universities through a strategic plan aiming at distinguished education and scientific research that goes along with modern technologies and community service.

We are looking forward to provide a high-quality smart system for education, learning, scientific research and community service in order to achieve Egypt's vision 2030 . This can be achieved by working on preparing an integrated technology and information infrastructure and an updated interactive website, providing smart academic and administrative systems and services, and building an integrated database that works with artificial intelligence techniques.

In the midst of the rapid rhythm of the twenty-first century, there is no opportunity except for those who are armed with a homogeneous mixture of knowledge, morals and culture.

We present this work to show the achievements made by the faculty professors, the assistants staff and the students at the Faculty of Engineering for the academic year 2019/2020.

***Quality Assurance Unit Manager
Prof. Maysa Omar***

MSA

02 VICE DEAN'S WELCOME

PROF . Hesham Aaref

We have one simple philosophy : “If it’s not perfect it’s not us “.

This statement transfers our goal from education to knowledge .

It means we are not concentrating on sciences only but also looking forward to developing soft skills and increasing global knowledge. We have established many activities serving this aim.

This year we achieved many accomplishments for example we held an international conference titled " The Path to City Resilience" , in which we had many international keynote speakers in addition to national experts . We also increased awareness that the other side of the coin of the university is research. We started a post-graduate Program in the level of urban sustainability and architecture sustainability.

Nowadays our staff is well trained on how to encourage students to attend by using artificial intelligence and smart programs. According to our needs we have founded structural and construction management program that will start Fall 21\22.

MSA University always adopts new trends nationally and internationally, specifically via the spirit of teamwork and the vision “ knowledge is a lifestyle not a desire “ .

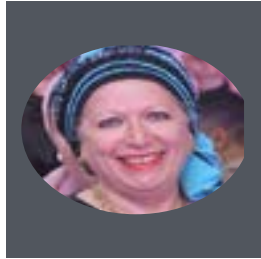
***Vice Dean Faculty of Engineering
Head of Architecture Department
Prof. Hisham Aref***

FACULTY OF ENGINEERING

2019\2020

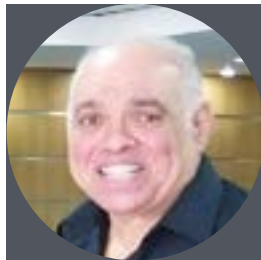


FACULTY OF ENGINEERING LEADERS



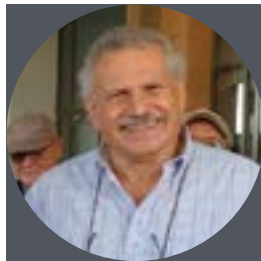
Prof. Maysa Omar

HEAD OF QUALITY ASSURANCE UNIT



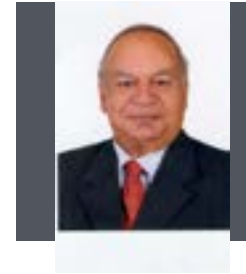
Prof. Hesham Aaref

**VICE DEAN OF FACULTY OF ENGINEERING
HEAD OF ARCHITECTURE DEPARTMENT**

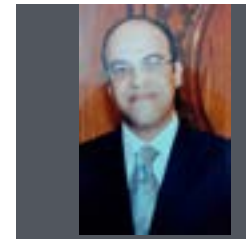


Dr. Omar Fawzy

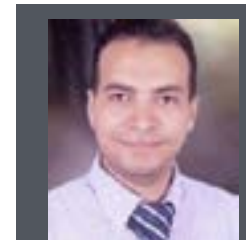
PROGRAMME LEADER



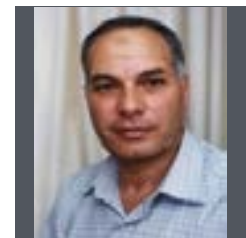
**Prof. Mostafa Zaki
Head of Mechatronics Systems Engineering
Department (MSE)**



**Assoc. Prof. Ahmed Mohamed Diaa Eldin
Head of Electrical Communication and Elec-
tronic Systems Engineering (ECE)**



**Assoc. Prof. Samer Ibrahim
Head of Computer Engineering Department**



**Dr. Mohamed Elsaed Hassan
Program Leader Industrial Engineering System
(ISE)**

DR. NAWAL EL DEGWI HONORING



From the Academy of Scientific Research and Technology and Ain Shams University

Dr. Nawal Al-Degwi was honored at the celebration of the National Committee for Women in Science under the patronage of Prof. Khaled Abdel Ghaffar, Minister of Higher Education and Scientific Research, in the presence of Prof. Mahmoud Saqr, President of the Academy of Scientific Research and Technology. His Excellency presented her as the lady who is tireless and relentless about work and hope in the service of education and society.

Dr. Nawal Al-Degwi was also honored for her contributions in the field of education by Prof. Mahmoud Al-Matini, President of Ain Shams University, in the fourth conference of the College of International Education held under the name “Faculties of Education and School Integration .. Internationalization ... Development”.

STAFF MEMBERS HONORING CEREMONY



STUDENTS HONORING CEREMONY



Students and graduates of MSA University

MSA has a long record of achievements, awards and first places in many international scientific competitions, entrepreneurship, tournaments and local and international sports competitions that were achieved in 2019 under the supervision of distinguished faculty members and strong and continuous support and care from the university administration.

Dr. Nawal Al-Degwi (Chairman of the University Board of Trustees) and Prof. Dr. Khairy Abdel Hamid (President of the University) honored them with examples of success and excellence such as :

- Two students from the College of Engineering - Department of Electronics and Communications ,Mostafa Azoz & Abdelrahman Gamal,ranked second in the world in the Huawei ICT competition in China, with the participation of 100,000 students from 1,600 universities from 61 countries around the world.
- A group of students, graduates, and faculty members of the College of Engineering - Department of Architecture , Omar Ibrahim , Mohamed Abdelaziz , Mahmoud Amgad and Ahmed Zaki won the second and third place, and two encouraging prizes in the International Proposals competition for the Museum of Modern Arab Art (Sharjah - September 2019) from 190 finalists from 44 countries.
- One of the graduates of the College of Engineering - Architecture Department , Amr Mousa, won the Golden and Bronze Cairo Design Award 2019 in Product Design.
- A college student , Mina Maher, won the 2019 African Dodgeball Cup held in South Africa.
- Students won second and third place in the Republic Championship in synchronized swimming and advanced centers in the Athletic Federation of Universities' Athletics Championships.
- Students who ranked third in the African Championship for Youth under the age of 21 (Algeria 2019).
- Students who ranked second in the high jump athletics and second place high jump in the African Universities Championship, Sohaila Samir .

Land and Water Days (LWD)

In 2019 Land and Water Days were convened on 31 March-4 April in Cairo, to review the progress made in addressing water scarcity in the region, foster exchange of knowledge and experience among countries and partners and chart the way forward taking into account the lessons learned, the new challenges to and opportunities for sustainable development.

MSA University participated in two activities at the conference:

- Industrial Systems Engineering Department contributed with three graduation projects.
- Hackathon Competition: MSA University was shortlisted to compete against (Cairo University - Ain Shams University - Zewail University).

AI for Good “Global Summit 2020”

Eng. Ahmed Rashad Riad (Architecture Engineering Graduate, Class of 2006), the Business Development Manager, Strategic Engagement Division, TSB, ITU held a workshop at MSA campus to provide the students a global perspective about the overlap between artificial intelligence and sustainable development.

Ahmed works at the United Nations specialized agency for ICTs (ITU) HQ based in Geneva since 2014. He works mainly on the Artificial Intelligence for Good Global Summit in the areas of business development and programme coordination.

The talk covered some interesting AI applications, use cases, and an overview about the United Nations Sustainable Development Goals.

Also we did explore the overlap between AI and entrepreneurship opportunities, and how can start-ups scale by leveraging the potential AI applications to solve the global challenges.

In summary the workshop focused on the overlap between the UN sustainable development goals (SDGs), Artificial Intelligence and entrepreneurship.

It is an "AI and entrepreneurship for good" in a box!



A.I. (Artificial Intelligence) is the future of computing and machines. For example self driving cars is just the start of a new era where A.I takes over a lot of daily tasks.

In "Global Artificial Intelligence (AI) Boot-Camp" the Lecture presented at MSA University and powered by Microsoft the attendees were introduced to:

- AI and how to use it to our benefit.
- AI taxonomy (Machine Learning & Deep Learning)

The attendees created a full program without having any previous coding background and without the use of a single coding line and a contest between all the attendees from different faculties were held and the rewards were distributed by Microsoft.

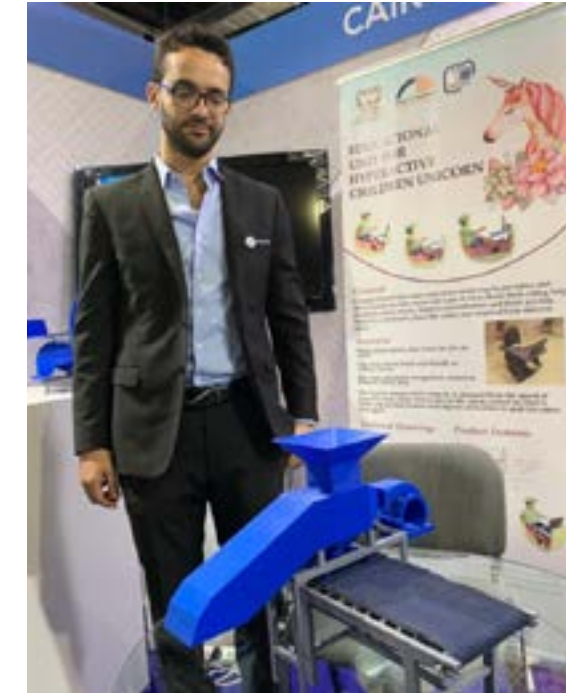
Digital transformation of Egyptian Manufacturing Symposium.

The Symposium discussed the Digitalisation, Incubation, Innovation & Digital Business Models and the following features were discussed:

- Relying on the SOA/ web services technology.
- Services are invoked remotely independently of their technology, a third part centralized entity, and location.
- The plug-in component does not impose any restrictions on the hosting ERP system.
- The software is easily configurable to fit the member platform .



Cairo International Exhibition of Innovation



Active participation and intense activity in the pavilion of October University for Modern Sciences and Arts - MSA University at the Sixth Cairo International Innovation Exhibition held at the International Convention and Exhibition Center from 24-25 October 2019 under the patronage of his Excellency the President of the Republic.

Valeo – Huawei

The university participated in that global competition within the framework of the cooperation protocol between Huawei and the Faculties of Engineering and Computer Science, organized by the Student Training Committee (STC) and within the practical training plan for university students and the continuous rehabilitation of the labor market.

Mostafa Azoz and Abdelrahman Gamal, students at electronic & communication Department were ranked the second place in the Huawei Global Network and Communications Competition with the participation of 100,000 students from 1600 universities from 61 countries around the world.



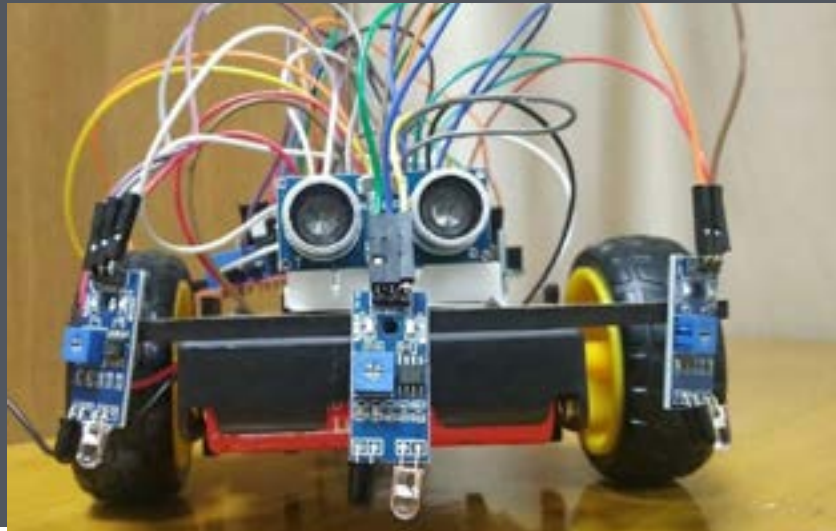
The graduation project of communications and electronics engineering students at the October University for Modern Sciences and Arts, MSA University, won the best research award at the largest conference in Egypt for radio science for the year NRSC 2020 out of 90 research papers submitted to participate in the conference, which was held from September 8 to 10 under the auspices of the International Federation of Radio Science URSI and IEEE

Faculty of Engineering students Hazem Ibrahim and Omar Hany Fathy won the best paper for the research paper extracted from the graduation project under the title of "Vehicle Detection and Lane Detection System Based on Machine Learning" under the supervision of Dr. Muhammad Saeed Darwish, a member of the faculty at the college, at the 37th annual conference for radio science, which is the oldest and largest annual conference held in Egypt.

The research deals with a driver's assistant system in avoiding collisions with other cars, adding greater protection to the driver and the road, and enabling the driver to see blind areas that he cannot see by relying on computer vision algorithms and machine learning to analyze the pictures taken on the road.

Congratulations to our dear students Hazem Ahmed, Omar Hani Fathy, and the supervising faculty members. We wish them and all university students and graduates continued success and more excellence.

For more details about the project and the conference:
[https://msa.edu.eg/.../best-graduation-research-award-in ...](https://msa.edu.eg/.../best-graduation-research-award-in-...)



IEEE's Robotics Workshop was a great success
It was so amazing seeing so many students with such an interest in working with robotics and we hope you had as much fun attending the workshop as we did while making it.
We're not done yet! Next semester will be packed with workshops from the amazing IEEE MSA team, so stay tuned and follow us on Facebook for more accelerated learning!

IEEE'S ROBOTICS WORKSHOP



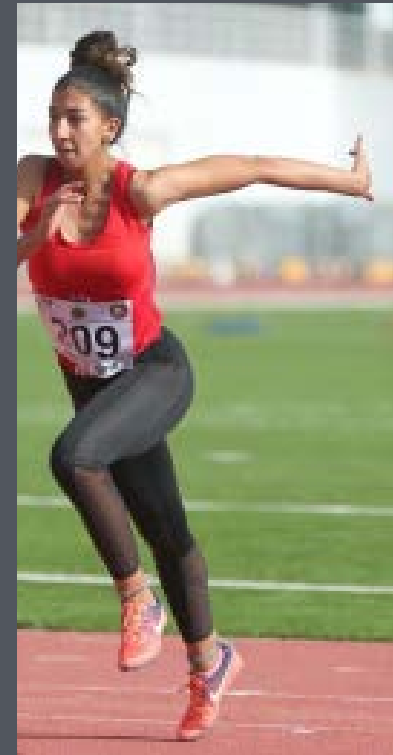


- Accomplishments:
- Omar Gharib holds the purple belt in Jiu-Jitsu from / Cyborg
 - Egypt Open No Gi Gold Medal 2014
 - Egypt Open Gi silver Medal 2014
 - New Breed Ultimate challenge No Gi Gold Medal 2015
 - New Breed Ultimate challenge Gi Silver Medal 2015
 - Las Vegas open Qualified to Quarter finals 2015
 - London Open Qualified to Quarter finals 2016
 - London winter Gi silver 2016
 - British Nationals No Gi bronze 2017
 - Madrid open No Gi silver 2017
 - Greece National pro Gi Silver medal 2018

STUDENTS WITH OUTSTANDING SPORTS PERFORMANCE



Mina Maher , Dodgeball African Cup 2019



Suhaila Samir Ahmed, a faculty of Engineering student, obtained the second place in the high jump in the Egyptian Universities Championship and in the African Universities Championship

STAFF TRAINING



MSA CREATIVITY & ACTIVITY CLUB



Gathering creative students to explore and reveal their talents, and to get the chance to exhibit their work sounded like a good idea. So the Creativity and Activity Club—was founded in 2019 in MSA University—aims to bring different students together under the umbrella of art, where talented students are encouraged to unleash their skills and share them with others who have similar interests. College days can be a lot more than mere studying for hours and attending lectures. Since the university is an excellent place to meet people of every kind, and who can do almost anything, it would be great to take an advantage of those assets before graduating. Making time for extracurricular activities can be a tough job that this club would make a lot easier. That happens when it brings people with passion together, sharing time and place and their love for a specific form of art. These arts could include just anything; from painting and sketching to baking, cooking, graphic design, costume-making, makeup, photography, writing, and a lot more.



Our amazing, innovative, creative student Osama Mohamed Rifat from the Faculty of Engineering won the first prize in Insomnia Egypt 2019 for cosplaying. Congratulations from all of us at MSA to Osama our senior student studying architecture, who is also a member in Creativity and Activity club. Insomnia Egypt is one of the biggest conventions in the middle east. The cosplay competition was hosting 4 international judges from abroad to judge during the event and choose the best cosplay.

MSA CREATIVE STUDENTS ARTWORK

1 BE A CREATIVE ARTIST
BY: DR. HEND ELFALAFY



Dr. Hend Elfalfay has been a professional artist for over 10 years. She has a Bachelor's degree in Fine Arts from the Faculty of Fine Arts, Assiut University. She has been a member of the Egyptian Artists' Syndicate since 2010. She has participated in several national and international art exhibitions. Her work is characterized by its vibrant colors and expressive brushstrokes. She has also been a judge in several art competitions. She is currently working on a new collection of paintings that explore the theme of nature and human emotion.

2 3D MODEL MAKER
BY: AMR A. ASKER



Amr A. Asker is a senior architecture student who loves architecture in various ways. He is currently working on a 3D model of a modern building. He is interested in the use of color and light in architecture. He has also been a member of the architecture club at his university. He is currently working on a new project that involves creating a 3D model of a city skyline. He is looking for ways to make his models more realistic and detailed.

3 SUSHI @ HOME
BY: MENNA AYMAN



Menna Ayman started painting when she was 10 years old. She has a passion for drawing and painting. She has been a member of the art club at her university. She is currently working on a new collection of paintings that feature various sushi dishes. She is looking for ways to make her paintings more colorful and vibrant. She is also interested in the use of food in art.

4 BE A FACE PAINTER
BY: NOUR NESSIM



Nour Nassim is a self-taught artist who specializes in face painting. She has been painting faces for over 5 years. She is interested in the use of color and light in face painting. She has also been a member of the face painting club at her university. She is currently working on a new collection of face paintings that explore the theme of human emotion. She is looking for ways to make her paintings more realistic and detailed.

5 THE ART OF 3D MODELING
BY: MAGED ALY



Maged A. Aly is a senior architecture student who has a passion for 3D modeling. He is currently working on a 3D model of a modern living room. He is interested in the use of color and light in 3D modeling. He has also been a member of the architecture club at his university. He is currently working on a new project that involves creating a 3D model of a city skyline. He is looking for ways to make his models more realistic and detailed.

5 THE ART OF 3D MODELING
BY: MAGED ALY



Maged A. Aly is a senior architecture student who has a passion for 3D modeling. He is currently working on a 3D model of a modern living room. He is interested in the use of color and light in 3D modeling. He has also been a member of the architecture club at his university. He is currently working on a new project that involves creating a 3D model of a city skyline. He is looking for ways to make his models more realistic and detailed.

6 POST PRODUCTION PHOTOSHOP
BY: MIRNA BINT MOHAMMED



Mirna Bint Mohammed is a senior architecture student who has a passion for post-production in Photoshop. She is currently working on a post-production project for a photograph of a sailboat. She is interested in the use of color and light in post-production. She has also been a member of the architecture club at her university. She is currently working on a new project that involves creating a post-production project for a photograph of a city skyline. She is looking for ways to make her post-production projects more realistic and detailed.

7 THE BEAUTY OF ART
BY: YASMINA ADEL



Yasmina Adel is a senior architecture student who has a passion for art. She is currently working on a new collection of paintings that explore the theme of human emotion. She is looking for ways to make her paintings more realistic and detailed. She is also interested in the use of color and light in art.

8 SUSHI @ HOME
BY: DR. LAMYA SHEHATA




Dr. Lamya Shehata is a senior architecture student who has a passion for art. She is currently working on a new collection of paintings that explore the theme of human emotion. She is looking for ways to make her paintings more realistic and detailed. She is also interested in the use of color and light in art.

9 PHOTOSHOP BRUSH TECHNIQUES
BY: NADA YOUSSEF




Nada Yousef is a senior architecture student who has a passion for Photoshop brush techniques. She is currently working on a new collection of Photoshop brush techniques. She is looking for ways to make her Photoshop brush techniques more realistic and detailed. She is also interested in the use of color and light in Photoshop brush techniques.

10 THE ART OF EMBROIDERY
BY: HADIDA NAGER



Hadida Nager is a senior architecture student who has a passion for embroidery. She is currently working on a new collection of embroidery projects. She is looking for ways to make her embroidery projects more realistic and detailed. She is also interested in the use of color and light in embroidery.

11 IMPERSONATING BY DRAWING
BY: MARYAM FARAHAT



Maryam Farahat is a senior architecture student who has a passion for drawing. She is currently working on a new collection of drawings that explore the theme of human emotion. She is looking for ways to make her drawings more realistic and detailed. She is also interested in the use of color and light in drawing.

12 INSIDE THE FAD LAB
BY: AHMED ESSAM



Ahmed Essam is a senior architecture student who has a passion for digital fabrication. He is currently working on a new collection of digital fabrication projects. He is looking for ways to make his digital fabrication projects more realistic and detailed. He is also interested in the use of color and light in digital fabrication.

13 MONOCHROME ART
BY: SAMAR ATEF GOURA



Samar Atef Goura is a senior architecture student who has a passion for monochrome art. She is currently working on a new collection of monochrome art projects. She is looking for ways to make her monochrome art projects more realistic and detailed. She is also interested in the use of color and light in monochrome art.

14 PHOTO MANIPULATION
BY: YOUSIF HANDEY



Yousif Handey is a senior architecture student who has a passion for photo manipulation. He is currently working on a new collection of photo manipulation projects. He is looking for ways to make his photo manipulation projects more realistic and detailed. He is also interested in the use of color and light in photo manipulation.

STUDENTS ACTIVITIES EXHIBITION



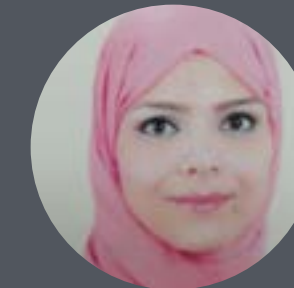
ADMINISTRATIVE STAFF MEMBERS



Nahed Sarhan
Senior Executive Assis-
tant, Dean's Office



Hala Abdelrahman
Executive Assistant,
Architecture Systems En-
gineering Department



Nehal Talaat Mahmoud
Elsaid
Administration Assistant
(Secretary Dean's office)



Rania Mohamed
Executive Assistant, Qual-
ity Assurance Unit



Heba Othman
Administrative Assistant,
Electrical Engineering
Systems Department

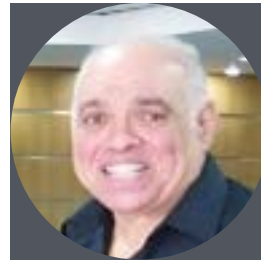
ARCHITECTURE DEPARTMENT

2019\2020

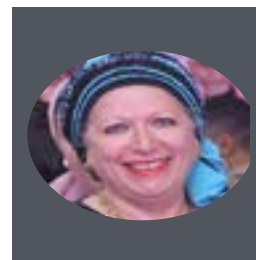


STAFF MEMBERS

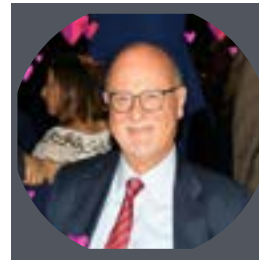
PROFESSORS



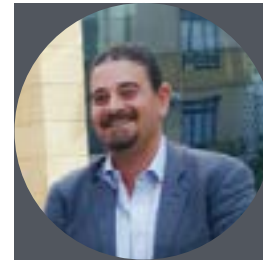
Prof. Hesham Aaref



Prof. Maysa Omar

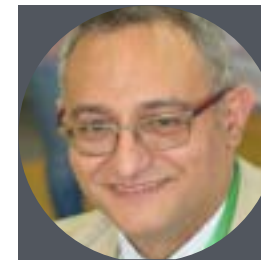


Prof. Namir Heikal



Prof. Ahmed el Shetewy

ASSOCIATE PROFESSORS



Assoc. Prof.
Sameh El Feky



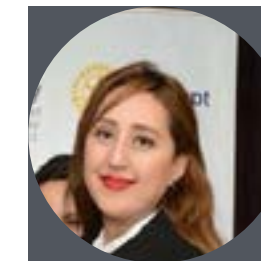
Assoc. Prof.
Nermeen Abdelglil



Assoc. Prof.
Zienab Fisal



Assoc. Prof.
Nihal Aamer



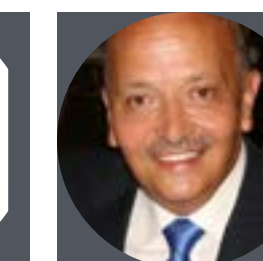
Assoc. Prof.
Rania Elmesseidy



Assoc. Prof.
Shady Shawky



Assoc. Prof.
Tarek Abd el Salam



Assoc. Prof.
Hesham Ma'moon

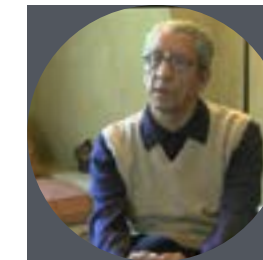
LECTURERS



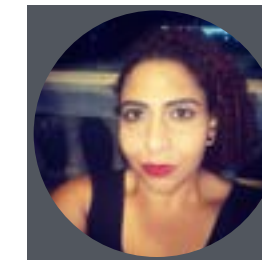
Dr. Doaa Esmat



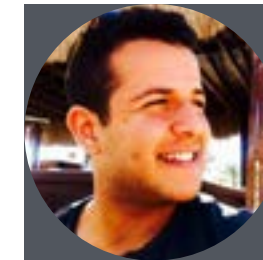
Dr. Elmahdy Mohamed



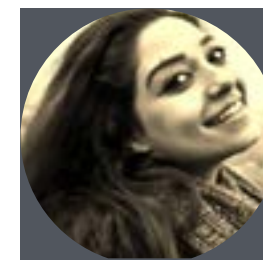
Dipl. Eng. Adel Fahmy



Dr. Nourhan El Zaafarany



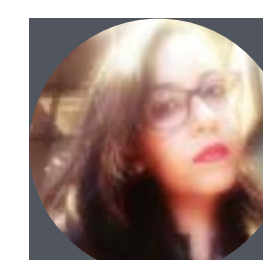
Dr. Ahmed Abd EL
Salam



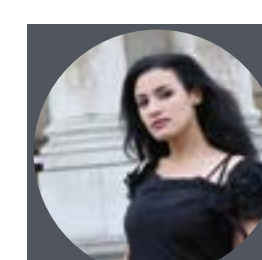
Dr. Rasha Sayed



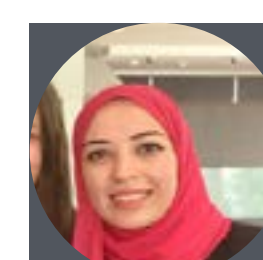
Dr. Kanzy Mohamed



Dr. Ghada Ghazala

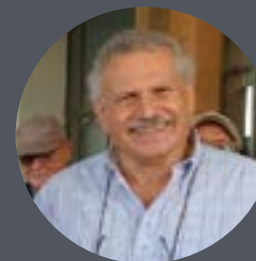


Dr. Lamyaa Shehata

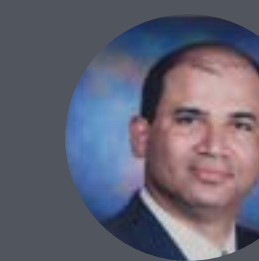


Dr. Eman Saleh

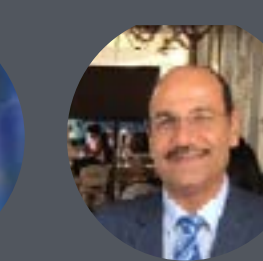
LECTURERS



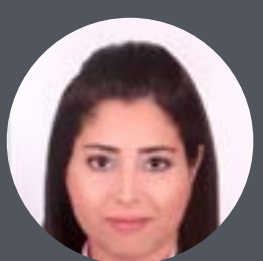
Dr. Omar Fawzy



Dr. Tarek Galal



Dr. Emad Helal



Dr. Mai Mohamed



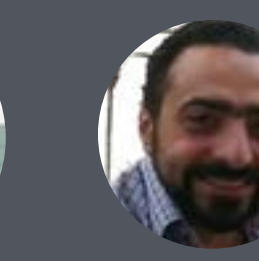
Dr. Hasnaa Alsherbieny



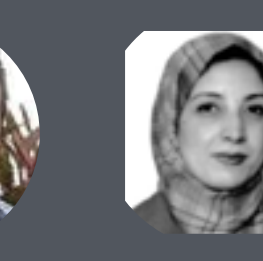
Dr. Ahmed Awad



Dr. Mohamed Ameen

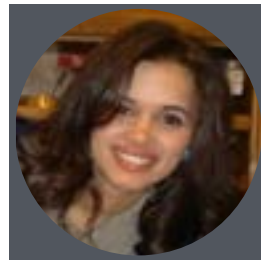


Dr. Karim M. Ayyad

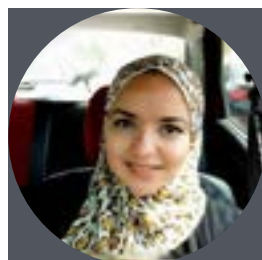


Dr. Salwa El-Gendi

ASSISTANT LECTURERS



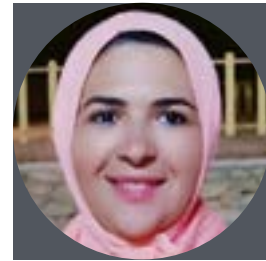
L.A. Shereen Abo dagher



L.A. Alaa El sherif



L.A. Mona Mostafa



L.A. Nermine Nofal



L.A. Arwa Hussien



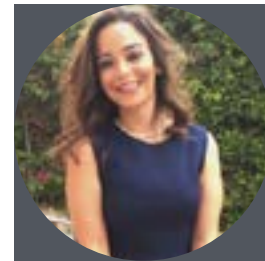
L.A. Rana Zaki



L.A.S haimaa Galal



L.A. Lobna Galal



L.A. Aya Magdy



L.A. Marine Medhat



L.A. Sherouk Mohamed



L.A. Hend Mostafa



L.A. Abdelhameed Jalal



L.A. Mohamed Rafik



L.A. Omar Elmelegy



L.A. Olvya Bakry



L.A. Aya Elkholy

TEACHING ASSISTANT



T.A. Badr Moahmed



T.A. Jessy Tarek



T.A. Islam Ali



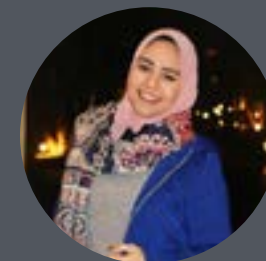
T.A. Omar Mostafa



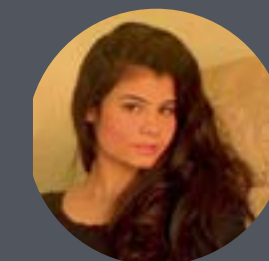
T.A. Ali Mosleh



T.A. Alaa Elsayed



T.A. Shereen Husieen



T.A. Youmna Khalifa



T.A. Youmna El Ghazaly



T.A. Mirna Mohamed



T.A. Mostafa Soliman



T.A. El Hassan Elgarhy



T.A. Nada Hatem



T.A. Enas Elmassah



T.A. Amr Nagy



T.A. Yihia Qandeel



T.A. Nariman Nashaat



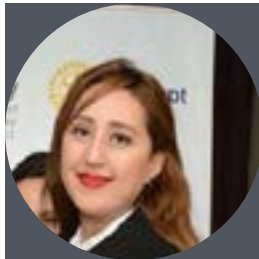
T.A. Yousra Mohamed



T.A. Ahmed Bayomei

STAFF PROMOTIONS

ASSOCIATE PROFESSORS



Assoc. Prof.
Rania Elmesseidy

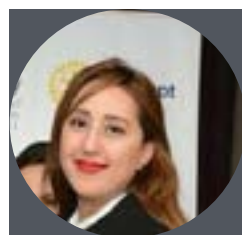


Assoc. Prof.
Shady Shawky

STAFF ACCOMPLISHMENTS



Prof. Maysa Omar



Assoc. Prof.
Rania Elmesseidy

P4CA Affiliate "Planners for Climate Action" UN-HABITAT

STAFF ACCOMPLISHMENTS



Assoc. Prof.
Nihal Aamer

- POSTGRADUATE CERTIFICATE has been awarded to Dr. Nihal Amer , having followed an approved programme in HIGHER EDUCATION, University of Greenwich, 11th July 2019.
- Certificate of achieving the status of Fellow of the Higher Education Academy in recognition of attainment against the UK Professional Standards Framework for teaching and learning support in higher education, 2019, UK.
- Certificate of Participation for outstanding presentation in the 3 rd Annual International Conference in Higher Education held on 3 rd April 2019 at MSA University “Active Learning Methods and Technology”
- Certificate of Participation for outstanding poster presentation in the 3 rd Annual International Conference in Higher Education held on 3 rd April 2019 at MSA University “Peer’s online quiz preparation: A New Team-Building Activity in The Classroom”
- PGCert HE Certificate for Commendable work in the production of Formative Task 1 (ACAD1286), 18 th June 2019 “Teaching Philosophy”, Work was considered to be particularly outstanding in terms of the construction of the philosophy itself and the medium of expression.
- PGCert HE Certificate for Commendable work on Formative Task 1 (ACAD 1287), 18 th June 2019 “Review of Quality Assurance Artefacts” Demonstrated focus and conciseness in putting together a report which reflected genuine engagement with (and insight into) the artefacts and processes scoped. Demonstrated critical analysis in identifying significant issues and viewpoints, including some critical evaluation.
- PGCert HE Certificate for Commendable work in the production of a “Professional Development in HE Portfolio (ACAD 1288)”, 18 th June 2019.
- Certificate for participating in The 23rd NileTESOL Annual Conference held at the American University in Cairo (AUC). The theme: “Exploring Quality Teaching and Learning: Apply and Reflect. January 22nd & 23rd, 2019 in The American University of Cairo.
- Certificate of Attendance in the 3 rd Annual International Conference in Higher Education held on 3 rd April 2019 at MSA University
- Certificate of Attendance in the Transnational Multidisciplinary Research Conference (TMRC-2018) held on 2 nd of October 2018 at MSA University.

Reviewer in Journal:

- Reviewer in Compass: Journal of Learning and Teaching, UK
- Compass is a peer-reviewed cross-disciplinary research journal that welcomes articles, case studies and opinion pieces relating to innovative learning, teaching and assessment.

Editor of the Book proceedings of the conference “ The Path to City Resilience, 2020” ISBN 978-977-90-7101-15

STAFF ACCOMPLISHMENTS



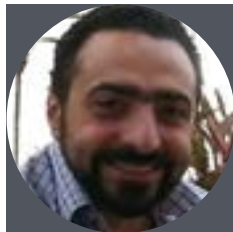
Dr. Doaa Essmat

P4CA Affiliate "Planners for Climate Action" UN-HABITAT



Dr. Mohamed Ameen

- Certificate: GIS Professional Certificate
Awarding Agency: The GIS Certification Institute, Illinois, the United States of America (USA)
- Certificate: Satellite Remote Sensing for Agricultural Applications
Awarding Agency: The National Aeronautics and Space Administration (NASA), Washington, D.C , the United States of America (USA)



Dr. Karim M. Ayyad

- Achieving the PGCert Postgraduate Certificate in Higher Education at the University of Greenwich.
- Acquiring FHEA (Fellowship of the Higher Education Academy in UK)
- Participating in the editing of Egypt Vision 2030 with the Ministry of Environmental Affairs



Dr. Rasha Sayed

P4CA Affiliate "Planners for Climate Action" UN-HABITAT



Dr. Kanzy Mohamed



8TH International Conference Dept. of Architecture Eng. Faculty of Engineering, Cairo University, 2019 "BUILDING THE FUTURE NOW"

PUBLICATIONS

Omar ,M. , Amin, A., (2020) The role of the state in formulating policies of Resilience in the field of urban planning, Proceedings of the Path to City Resilience international conference, MSA University, Egypt.

Amer,N., (2018.) "Integrating Biomimicry Principles in Architecture Design" 2nd International Research Conference on SUSTAINABLE DEVELOPMENT AND SOCIAL RESPONSIBILITY, American University in the Emirates, Dubai, UAE.

Amer,N., (2019) "Biomimetic Approach in Architectural Education: Case Study of Biomimicry in Architecture" Course , Ain Shams Engineering Journal, Faculty of Engineering, Ain Shams University, Vol. 10, pp. 499-506.

Feisal,Z., (2019) INFILL DESIGN IN HERITAGE SITES Study of experts' preferences and attitudes, Journal of Engineering and Applied Science.

Feisal,Z., (2019), Coastal cities Resilience for Climate Change Case study: Egyptian North coast cities, Journal of Urban Research.

Feisal,Z., (2020), Constructed wetland parks: A pathway to sustainability for Cairo, Journal of Urban Research.

Feisal,Z., (2020), Enhancing sustainability of historic contexts through infill landscape projects, Journal of Urban Research.

El Gindi, S., (2020). Integration of Energy Efficiency measures and Renewable Energy technologies as an Approach to Sustainable development in Egypt. Proceedings of the Path to City Resilience international conference, MSA University, Egypt.

El Gindi, S., (2020). The Effect of Shading Devices with integrated Photovoltaics on Energy Efficiency of buildings. The third international conference on green urbanism, Rome, Italy.

Sayed R., Shiba A. (2020) , "The role of architectural design in raising the efficiency of temporary Infection Isolation to deal with epidemics as an alternative to public hospitals palaces". In proceeding of Journal of Xi'an University of Architecture & Technology. ISSN No: 1006-7930.

L. M. SHEHATA , H. S. GABR AND A. H. ALSADATY.
(2020), CONSTRUCTING A CONCEPTUAL TOOL OF SOCIABLE PUBLIC PLACES: AN INTEGRATED APPROACH. Journal of Engineering and Applied Science, Faculty of Engineering, Cairo University, Vol. 67, No. 3, Pp. 547-564.

Nofal,N., Kamal, M., (2020). The Resilience of Alexandria waterfront transformation and development - Waterfront physical-functional dimension. Proceedings of the Path to City Resilience international conference, MSA University, Egypt.

lareef,E.,Mosleh,A.,(2020) Visual and thermal effect of contemporary building's facade on urban spaces.. Proceeding of the path to city resilience international conference, MSA University, Egypt

Othman,M., Elareef,E., Chronopoulou,A., Mirzabeigi,S., Pesenti,M., Miliokas,E., Khalilinasr,B., Vakili,B.,(2020). Innovative responsive shading system: Multifunctional case study in Milan. Rapid cities-responsive architectures conference ,AUD University,Dubai. [20:33, 9/22/2020] Nermin Nofal:

COMPETITIONS

CDA - Cairo Design Award

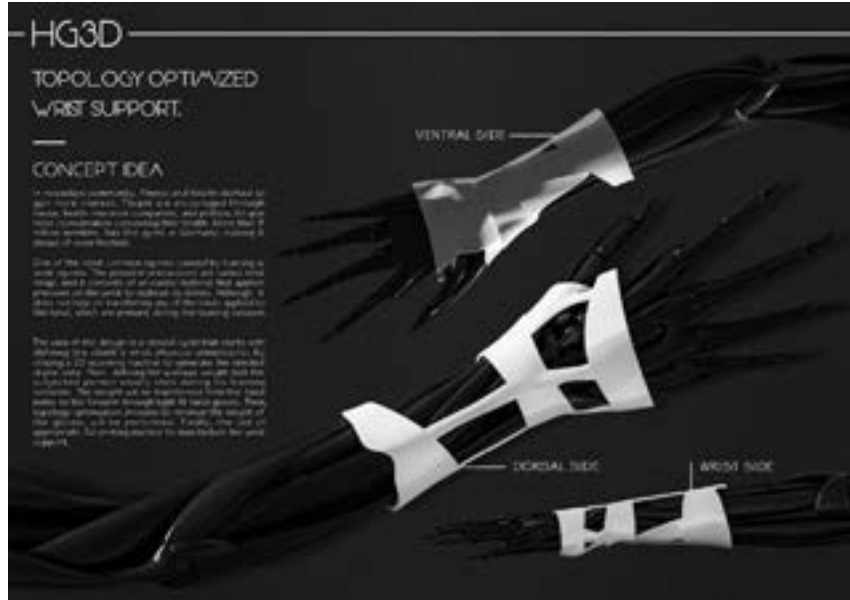
Cosmos Architecture

Tamayouz Excellence Award

Hadith Narrators Museum

SAINT-GOBAIN “Multi Comfort House”
In Greece – Urban innovations

Cairo Design Award 2019



Amr Mousa is a graduate of MSA University. Amr has successful collaborations in many projects -as an independent designer- with companies from Belgium, Germany, the USA, and Egypt. He has been recognized by national and international awards that vary between product design, branding, and typography. Amr is always trying to provide more creativity in all design fields.

He was awarded the Gold and the Bronze Prize in the CDA



COMPETITION BRIEF

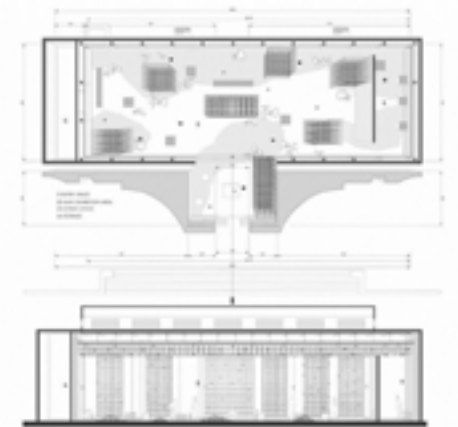
In nowadays community, fitness and health started to gain more interest. People are encouraged to give more consideration concerning their health.

One of the most common injuries caused by training is wrist injuries.

The idea of the design is a closed cycle that starts with defining the client's wrist physical dimensions; by utilizing a 3D scanning machine to generate the needed digital data and at the final stage is to manufacture the wrist support.

Cosmos Architecture Proposes Egyptian Pavilion

Cosmos Architecture, an international practice based in Madrid, Milan, Shanghai, and Cairo has designed a proposal for the Egyptian Pavilion in the Venice Biennale 2020. The project is an awareness campaign, highlighting diverse environmental issues occurring in Egypt and presenting proper solutions.



Sameh is an architecture student at MSA university. he has been awarded several times for his academic excellence. he worked for six months at CDC Abdel-Halim office under direct mentoring of Dr. Abdel-Halim Ibrahim an Aga Khan winning architect. His work focuses on new spatial concepts intensifying. existing potentials with integrated design methodologies through architectural research by the aim of merging pragmatic paradigms with innovative design in multiple scales.



Tamayouz Excellence Award

Omar Mostafa is an award-winning talented young architect who is passionate about science and how to apply it in architecture. He has an interest in building technology and how to apply it to decrease the use of energy inside buildings. He is talented in environmental simulation. He is an MSA Graduate, Cairo University Masters Candidate, also he won a number of architecture competitions, the last of which was Tamayouz Award Honorable Mention.

Competition Brief

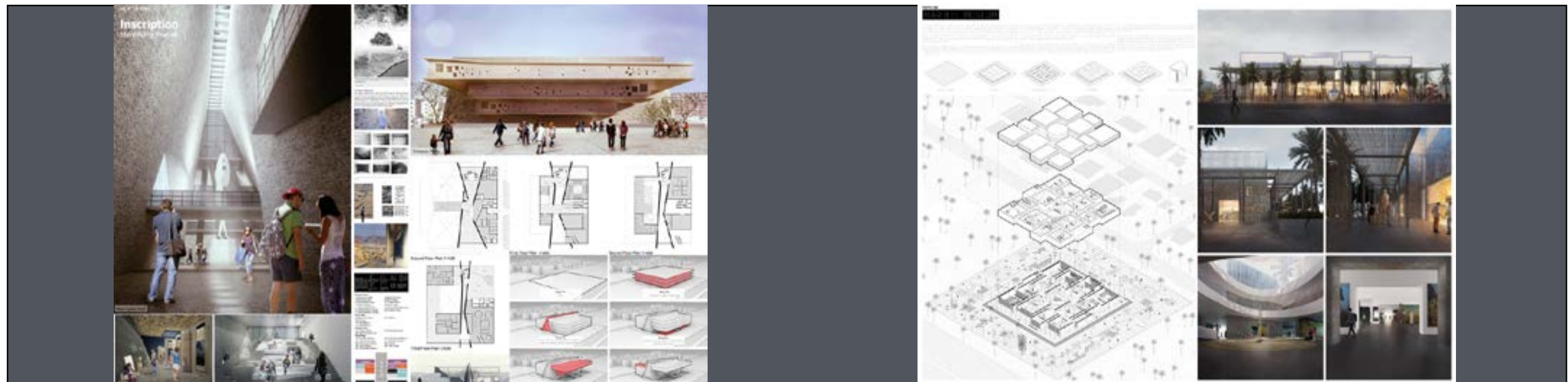
Rifat Chadirji Prize, an annual thematic prize named after the prolific Iraqi architect and academic Dr Rifat Chadirji. This year, the prize sought proposals for a modern Arab art museum in Sharjah, UAE, to house Barjeel's extensive art collection, which consists of artwork sourced from across the Middle East.



Tamayouz Excellence Award

“With this design, the architects show a careful and precise attitude. The design bears witness to stylistic refinement and forms a convincing answer to the given task from a functional, cultural and architectural point of view. However, we would have welcomed more consideration to the arrival experience and its connection to the local neighborhood. We are intrigued by the space, and can see that a permanent or contemporary collection would suit it; although, we are less sure how the interactive element is embedded within it.”

Arch. Mostafa Elghazawy, Arch. Mohamed Yasser and Arch. Ahmad Hilal



Tamayouz Excellence Award



ABOUT MOSTAFA ELGHAZAWY

Mostafa Elghazawy, specialized in parametric and computational design, graduated in 2018. He participated in several international competitions and was awarded Tamayouz Excellence Award and Dewan Architects Award for two years in a row. Mostafa is currently a lead designer at Consultancy Group, KSA. And pursuing his Master's degree in digital fabrication and computational design at the Dessau Institute of Architecture in Germany.

The project is located at the foot of a mountain west of the Prophet's Mosque, along the new road of Imam Muslim.

The project aims at highlighting the Islamic heritage associated with the noble Prophet's biography by shedding light on hadith narrators. The museum will present interactive and visual stories and sites for activities that transport the visitor to experience the past and understand the methodologies that are followed in mod-



Hadith Narrators Museum

SAINT-GOBAIN "Multi Comfort House" In Greece – Urban innovations

"Urban Innovations" competition organized by Cairo University and the American University in partnership with the Dutch embassy in Cairo, the British Cultural Center and SODIC. Graduates and students of the Department of Architecture at MSA won the second place equally with a team from ETH Zurich.

Another team of MSA students won the third place in the competition in which more than 16 teams from various Egyptian and foreign universities participated.

1. Ed Hossam Al-Barambali, Ain Shams University, as president
- 2, Ed Ahmed Al-Sharif, the American University as a member
3. Ed Ayman Othman, British University, as a member
4. Ed Sherif El Feki, the Arab Academy for Maritime Transport and Technology, Sheraton, as a member
5. Ed Mohamed Magdy Abu El-Nour, Faculty of Fine Arts, Zamalek, as a member
6. Ed Lamis Al-Jizawi, Mansoura University, as a member





In a major ceremony held at Cairo University on Wednesday, April 1, the names of the winners of the "Urban Innovations" competition organized by Cairo University and the American University in partnership with a neighboring institution and with the support of the Dutch Embassy in Cairo, the British Cultural Center and SODIC were announced. Graduates and students of the Department of Architecture at the October University of Modern Sciences and Literature MSA won the second place equally with a team from ETH Zurich after the decision of the jury consisting of professors from the mentioned organizing universities in addition to the British architect David Cook and the Dutch architect JurgenBey withholding the first prize. Another team of MSA students won the third place in the competition in which more than 16 teams from various Egyptian and foreign universities participated.

"Urban Innovations" competition was organized by Cairo University and the American University in partnership with the Dutch embassy in Cairo, the British Cultural Center and SODIC. Graduates and students of the Department of Architecture at MSA participated in this competition .



WORKSHOPS

UK Summer Abroad Program

LAND 2019 - Greece

Socio-Cultural Nodes in Historic

Parametric Design
Districts

GREENWICH SUMMER COURSE



MSA University offers a great opportunity by facilitating the international interaction in the Summer Abroad program for students to experience the student life at the UK Partners Campus in the United Kingdom (Greenwich University & Bedfordshire University).

It is a rich experience to see other teaching methodologies and see new cultures and acquire new academic and Character building skills.



LAND2019 workshop in Greece.



The LAND2019 workshop was accomplished successfully in Greece. The workshop was between MSA university and university of Thessaly and was held in Vavdos village near Thessaloniki.

LAND2019



Socio-Cultural Nodes in Historic Districts



The workshop was held from 15 to 17 Feb 2019 in MSA University. The following names were the team participating in this workshop.

MSA University staff:

Prof. Dr. Alaa El Habashy (Keynote speaker)

2. Dr. Nihal Amer
3. Dr. Rania El Messeidy
4. Dr. Eman Saleh
5. Shereen Dagher
6. Rana Zaki
7. Omar Mostafa Hassan
8. Abdelhamid Jalal Darwich
9. Al Shaimaa Galal El Din Zohdy



MSA University students:

- Amr Magdy Allam
2. Taiseer Abo El Magd Mounir
 3. Ahmed Hamdy Soliman
 4. Marwan Amr El-Zainy
 5. Mohamed Khaled Bedir
 6. Kareem Abd El-Wahhab Mohamed
 7. Bahaa Gamal El-Deen Abu Al-Fotoh
 8. Ahmed Mohamed Reyad
 9. Omar Hassan Mohamed Ragab
 10. Mohamed Ashraf Mohamed Abdel-Aziz
 11. Noor Sayed Ahmed Samy Mostafa
 12. Kholoud Abdelatty Sayed
 13. Rana Hussein Abdallah



Parametric Design Workshop



The architecture staff team held a parametric design workshop where they learned the parametric design process and applied this process on several physical models they have done using several software programs.



City Branding workshop

Invitation for Faculty members to attend the city branding workshop as participation with faculty graduates



EVENTS

Blending Art with Architecture

The Path to City Resilience

Blending Art with Architecture



This event tried to share a lot of young architects experience in the categories of design & competition in many fields that involves design. Integrating different types of art with architecture for more creative outcome.

Speakers :

" HOW TO HAVE FUN & Win A Competition " 12:00 PM

Arch. Omar Mostafa - Arch.Mahmoud Amgad - Ahmed Zaki

"Why do we need Cinema studies in the Architecture Department" 12:30 PM

Arch. Taher AbdelGany

" Design Thinking as a Mindset " 01:00 PM

Arch. Amr Mousa

" Self-learning Digital Art " 01:30 PM

Arch. Mohameed Matter

ELECTRICAL DEPARTMENT

Electrical Communication and Electronic System Engineering/ Computer Systems Engineering Department 2019\2020



ECE DEPARTMENT OBJECTIVES

The main aims and objectives of these efforts from ECE department are as follow:

**Ahmed Mohamed
Diaa Eldin**

Acting Head of Electrical Communication and Electronics Systems Engineering department.

1. Improve professional skill set and calibers for both undergraduate's students and make them ready for market hiring.
2. Create plug and play pool of talents fit for business needs and customized with corporate footprint.
3. Improve collaboration and partnership with the industry.
4. Develop calibers with creative mindsets who are passion to innovate.
5. Make innovation part of everyone day2day activities.
6. Build MSA CoE (Centre of Excellence) that interfaces and manages interlock with the industry.
7. Enable our students to create strong networks, achieve critical experiences, and develop core skills that position them for career success.
8. Help graduates to learn about multi-national organization and IT industry and diverse product lines and participate in peer job shadows
9. Support graduates to gain a cross-functional understanding of how our business functions work.
10. Enable graduates to succeed in their careers at multi-national organizations
11. Build strong partnership with industry and gain trust to promote this level in the future
12. Setup academic Alliance or MOU (Memorandum of Understanding) to interface with industry
13. Gain new talents and soft skills of how to communicate and present projects in professional approach like in IT industry to international clients
14. Promote the partnership between industry and MSA to increase number of sponsored projects by Multinational organizations who are equipped with the technology, skills and competencies that fit for market needs.
15. Start to have new type of activities sponsored by industry like Electives courses offered by industry experts from industry to MSA students.

RESEARCH+ PUBLICATIONS

Ahmed Mohamed
Diaa Eldin,
Assoc. Professor

1-Hassanein, Ahmed M D E; Mohammed, Yasser; Ehab, Youssef. "A Dataset of Handwritten Arabic Letters for Machine Learning Applications" International Journal of Computer Science and Software Engineering; Dubai Vol. 8, Iss. 11, (Nov 2019): 285-293.

Hossam Selmy,
Assoc. Professor

1- H. B. Eldeeb, M. Elnahhal, H. Selmy and F. E. Elsamie "Continuous phase modulation with chaotic interleaving for visible light communication systems based on orthogonal frequency division multiplexing" accepted for publication in Transactions On Emerging Telecommunications Technologies.

2- M. Hosny, H. A. I. Selmy, K. M. F. Elsayed, "Co-channel Interference Reduction by Optimizing Field of view Angle of Angular Diversity Receiver in VLC Systems" in the Proc. Of 22th Int. Conf. Transparent Optical Networks (ICTON 2020), Bari, Italy, July 19-23, 2020.

3- M. Hosny, H. A. I. Selmy, A. Srivastava, K. M. F. Elsayed, "Co-Channel Interference Management in Visible Light Communication" in the Proc. of 29th Wireless and Optical Communications Conference (WOCC 2020), New Jersey, USA, May 1-2, 2020.

Ahmed Fawzy,
Lecturer

1-Ahmed F. Daw, Mahmoud A. Abdalla, and Hadia M. Elhennawy, "Wideband Slow Phase Loaded Inductor Loaded-Composite Right/Left Handed Transmission Line for Compact UWB Power Divider", Microwave and Optical Technology Letters, Feb. 2020. DOI: 10.1002/mop.32310. IF 1.3 (Q2)

2- Ahmed F. Daw, Petar F. Ghaly, Marian A. Nashat, " Quad-Band Resonator Depends on CRLH/DCRLH Structures," Microwaves and RF Magazine, Vol. 23, no.3, Oct. 2019. IF: 0.21 (Q4)

Mohamed El Atrash,
Assistant Lecturer

1- Mohamed El Atrash, Mahmoud A. Abdalla, and Hadia M. El Hennawy, "A Compact Highly Efficient Π -Section CRLH Antenna loaded with Textile AMC for Wireless Body Area Network Applications", IEEE Transactions Antennas Propag., in press, 2020.

2- Mohamed El Atrash, Omar F. Abdalgamil, Ibrahim S. Mahmoud, Mahmoud A. Abdalla, and Sherif R. Zahran, "Wearable high gain low SAR antenna loaded with backed all-textile EBG for WBAN applications", IET Microw. Antennas Propag., vol. 14, no. 8, pp. 791-799, 2020.

STUDENTS PUBLICATIONS

1-Hassanein, Ahmed M D E; Mohammed, Yasser; Ehab, Youssef. "A Dataset of Handwritten Arabic Letters for Machine Learning Applications" International Journal of Computer Science and Software Engineering; Dubai Vol. 8, Iss. 11, (Nov 2019): 285-293.

FINANCIAL GRANTS

Ghada Abdelmouez
Assoc. Prof.

1- Received a funding of 30,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "An Efficient Speech Recognition System".
2- Received a funding of 15,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "Wireless controlled robotic arm using a brain-computer interface".

Mohamed Samir
Lecturer

1- Received a funding of 10,000 from the Information Technology Industry Development Agency (ITIDA) Egypt to fund the project "Safety and Health Device". Project ID: GP2020.R15.83

Mohamed Saeed
Lecturer

1- Received a funding of 24,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "Diagnosing Malignant versus Benign Tumors".
2- Received a funding of 30,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "Autonomous Fire Fighter Robot".
3- Received a funding of 12,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "Intelligent Agriculture Pests and Diseases Detection Based on Machine Learning".
4- Received a funding of 30,000EGP from the Academy of Scientific Research and Technology (ASRT) Egypt to fund the project "Intelligent Crash Avoidance System for Road Intersection Based on Machine Learning".

AWARDS+PRIZES

Ahmed Fawzy
Lecturer

1- Head of MSA-STC Club responsible for training opportunities, field trips and invited talks.
2- He has been elevated to the grade of Senior Member of IEEE this year.
3- MSA university wins the award of 2nd place worldwide in cloud computing in ICT Huawei competition from China.
4- MSA University wins 1st place as the best private university in Egypt due to the very high score that was achieved in all information technology competitions from Minister of communication, and minister of education and minister of international relations Egypt and CEO of Huawei Egypt.
5- Appreciation Certificate due to support and motivation to students to achieve the best places at national and international levels from MSA University.
6- Conference International Committee member, 2019 International Symposium on Advanced Electrical and Communication Technologies (ISAECT) Nov 27, 2019 - Nov 29, 2019. Roma- Italy
7- Conference International Committee member, 2020 International Symposium on Advanced Electrical and Communication Technologies (ISAECT) Nov 27, 2020 - Nov 29, 2020. Morocco.

Mohamed Saeed
Lecturer

1- Reviewer, NILES2020 conference, Egypt.

Mohamed Saeed
Lecturer

1- Graduation project title: "Real-Time Depth Estimation and Lane Detection System Based on Machine Learning" has won the best graduation project poster award at the 37th National Radio Science Conference (NRSC 2020), which was held in GUC. Student Names: Omar HanyFathy, Hazem Ahmed Ibrahim.

Mohamed El-Atrash
Lecturer

1- Reviewer for the "IET Microwaves, Antennas & Propagation", Ahigh quality journal with an impact factor of 2.73.

STUDENT ACTIVITIES

5th build your future event career advice (MSA-STC Club)



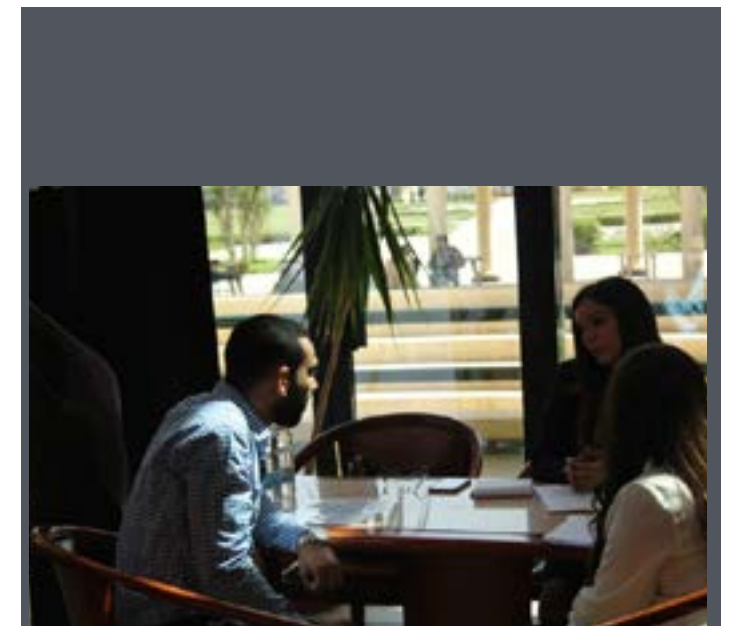
MSA engineering students having interviews with representatives of companies



Different companies held booths to receive students.



MSA students presenting their academic achievements to company representatives.



Group talks are arranged to discuss student concerns.



A photo for the organizing committee of the “build your future event career advice” event..

We held 4 online career advice webinar



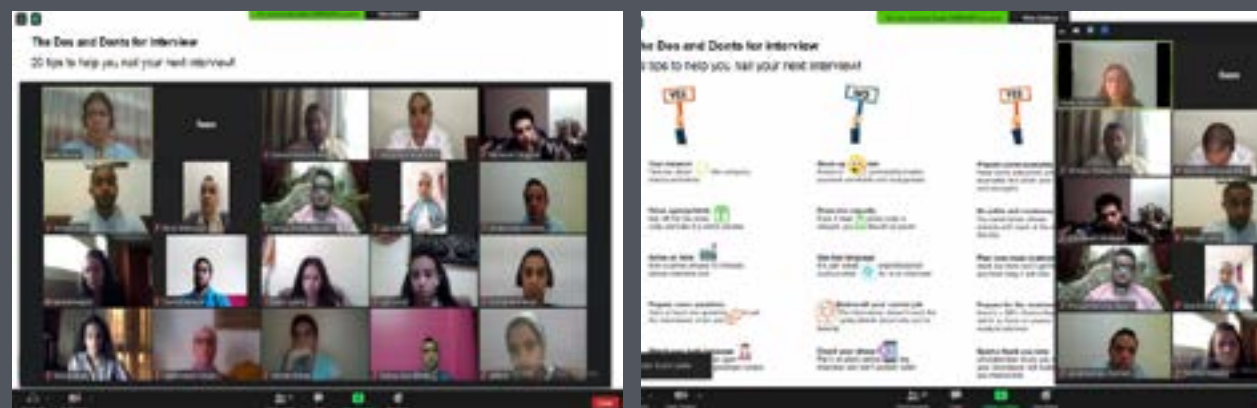
One online webinar was held by Vodafone to give advice to graduating students



Third Online webinar was held by WADI Group to give advice to graduating students.



A Workshop was held on Artificial Intelligence (AI) to train graduating students on up to date breakthroughs in AI.



Second Online webinar was held by HSBC Bank to give advice to graduating students.

FIELD TRIPS

- 1- On 10/10/2019, a field trip was held to Valeo for our students to introduce them to the possible job opportunities.
- 2- On 21/11/2019, a field trip was held to ElSewedy for our students to introduce them to the possible job opportunities.
- 3- On 1/3/2020, a field trip was held to New Capital power plant for our students to introduce them to the possible job opportunities.
- 4- On 26/2/2020, a field trip was held to Beity Factory for our students to introduce them to the possible job opportunities.

TRAINING

117 certified training opportunities were given by Huawei Company to ECE students.

Round number	Number of students From ECE	Training date
Network Round 1 (One group)	15 out of 15	5/1/2020
Network Round 2(One group)	10 out of 10	10/2/2020
Artificial Intelligence Round 1 (two groups)	31 out of 40	20/6/2020
Artificial Intelligence Round 2 (two groups)	18 out of 40	1/7/2020
Artificial Intelligence Round 3 (two groups)	24 out of 40	20/7/2020
Artificial Intelligence Round 4 (two groups)	19 out of 40	4/8/2020 - 15/8/2020

35 certified training opportunities were given by IBM Company to ECE students.

Round Number	Number of students from ECE	Training date
Cloud Round 1	3 out of 45	10/8/2020
Cloud Round 2	11 out of 25	24/8/2020
Artificial Intelligence	21 out of 100	30/8/2020

39 certified training opportunities were given by Systel Motorola Company to ECE students.

Round Number	Number of students from ECE	Training date
Round 1 (Mid-year)	11 out of 30	26/1/2020
Round 2 (Summer)	28 out of 30	30/8/2020

26 certified training opportunities were given by Maspero to ECE students.

Round Number	Number of students from ECE	Training date
Round 1	26 out of 26	25/1/2020

18 certified training opportunities were given by Electronic Research Institution to ECE students.

Round Number	Number of students from ECE	Training date
Round 1 (Mid-year)	16 out of 21	9/2/2020
Round 2 (summer)	2 out of 2	25/8/2020

10 certified training opportunities were given by Telecom Egypt (We) company to ECE students.

Round Number	Number of students from ECE	Training date
Round 1	10 out of 30	15/8/2020

5 certified training opportunities were given by Egyptian Space Agency to ECE students.

Round Number	Number of students from ECE	Training date
Round 1	5 out of 5	6/9/2020

GRADUATION PROJECTS

“Unattended 3D printing”

Prepared By:

“Ahmed Osama El-Sebaey” “160537”

“Mahmoud Shrief Mahmoud” “160513”

Supervised By:

“Dr. Maher El-Tayeb”

Abstract

The 3D printing process, also known as additive manufacturing, requires the use of specialized equipment to assemble an object layer by layer via a computer and a 3D model. Unlike traditional manufacturing it has some unique and interesting advantages. First, additive manufacturing allows the cost of production to remain the same rather than one or a thousand units. This has several implications, such as making production available to small businesses that do not have access to expansive funding and do not know in advance whether they will have many buyers and reducing the time between design and sale. So it enables each piece to be customized and unique. Second additive manufacturing reduces the lead time for short production runs and allows very complex shapes to be created without additional costs. The aim of the project is to create items with only minimal material used. Also, to generate new ideas / products build models and find replacement parts at a low cost.

“A Brain Controlled Wheelchair”

Prepared By:

”Nayera Hassan Ali 160623“

” ShroukTarek Mohamed 161877“

Supervised By:

“Dr.AhmedDiaa”

Abstract

The number of people who suffers from different movement disabilities increases yearly that’s why the use of a wheelchair is becoming essential. The target of our brain-controlled wheelchair is the people who are fully paralyzed who can’t use conventional wheelchairs so the proposed system tries to provide them with one of their daily basic needs. Although the already existing wheelchairs are designed to solve the problem for severe neuromuscular disabilities, they are not sufficient enough for all cases of paralysis because some of them requires physical movements such as hands and head to control the wheelchairs. But the proposed system mainly relies on the EEG signals so that the user can move, turn and stop the wheelchair only through thinking. A Neurosky mindwave headset is used to pick up EEG signals from the brain. The brain signals are processed to determine the direction of the movement of the wheelchair.

“A Smart Cane with Artificial Intelligence for the Visually Impaired”

Prepared by:
Mostafa Rahim 164339
Marwan Hesham 164159

Supervised by:
Dr. Mohamed Gamal

Abstract

This project discusses features of technological solutions for enabling the visually impaired and blind people to travel in outdoor environments without the help of others. One of the main obstacles that the visually impaired suffer from is the unavailability of the blind sticks that discover obstacles and alert the blind. Our research aims to devise a smart cane to assist the blind in motion by using a micro-controller (Raspberry Pi) and other components such as ultrasonic sensors. The main constituents of the independent travel are object detection and awareness.

“An Efficient Speech Recognition System”

Prepared By:
Kareem Atef Hassan 160087
Mohamed El Sharkawy 164613

Supervised By:
Assoc. Prof. Ghada Abdelhady

Abstract

Automatic speech recognition is a competitive system that a lot of researchers aim to work hard to reach the ideal model, the ideal model almost has the optimal accuracy in different scenarios for instance, the noisy environments and the various accents, these features are challenging and indeed a model like this does not exist till now. We seek to follow the latest technology and research papers to get these problems solved and to deliver a low latency system with the optimal Benchmark and capable of various challenges. Our vision is to apply our system in different applications as the personal assistant systems including operating machines through voice and voice search.

“Automatic Detection and Notification of Potholes and Humps on Roads to Aid Drivers”

Prepared By:
Sarah Hisham Ahmed Mohamed Fahmy 172475
Mariam Ehab Shoukry Megaly Gobrial 183511

Supervised By:
Dr. Hatem Zakaria

Abstract

One of the causes of local road accidents in developing countries, such as Egypt, is due to road damages such as potholes. In addition, there is no proper road maintenance in the local roads, and so the checking of potholes is done manually. Hence, in this paper we propose a simple and robust design of a portable and affordable device that will be suitable for local cab drivers here in Egypt. A distinguishing feature of this proposal is that it does not need a sophisticated smartphone to automatically send the reports, and was tested in an actual moving vehicle. This project proposes a cost-effective solution to identify the potholes and humps on roads and provide timely alerts to drivers to avoid accidents or vehicle damages.

“Autonomous Braking System for Cars Using Machine Learning Algorithms”

Prepared By:
Ahmed Azab Elsayed 164887
Mark Nagy Saad 164841

Supervised By:
Dr. Mohamed Saeed Darweesh
Eng. Ahmed Mahmoud

Abstract

This project aims to help self-driving cars and autonomous vehicles systems to merge with the road environment safely by implementing an autonomous braking system using machine learning and computer vision for driver's safety and to ensure the reliability of the system. In addition, it also provides assistance to the driver to reduce the road crashes and overcome the drowsiness related car accidents that occur usually around the world. The project uses two subsystems one inside of the car and the other is outside of the car. As for inside car, HOG+SVM and regression trees deal with the frames from the camera to detect the drowsiness of the driver. As for the outside car, the machine learning will help in detecting front objects using ultrasonic sensors by using binary classification.

“Autonomous Hospital”

Prepared By:
Mina Kamil Naguib Mettias 164449

Supervised By:
Dr. Mohamed Saeed

Abstract

Inside a hospital, nurses are essential for patient care, and their time is highly valuable. Yet, they spend considerable time performing manual tasks such as moving around wheelchairs, beds, and food trays. This is where the proposed system comes to work, helping elevate the quality of work inside a hospital by making objects move independently. This would directly influence the efficiency of all nursing jobs and remove a hectic task off their backs. Putting in mind that at times like these days of the COVID-19 pandemic, social distancing is necessary and a great feature to increase medical staff's safety. Furthermore, system provides the patient with a self-moving-wheelchair from their entrance to the hospital until their last minute, making the hospital and all moving objects fully autonomous.

“Autonomous Train to Shuttle between Stations”

Prepared By:
“SherifMagdy Ahmed” “155095”
“Farouk Ahmed Fouad” “161659”

Supervised By:
“Assoc.Prof.Dr.HatemZakaria”

Abstract

Transportation acts as one of the most important fields in our life, but it face many challenges during the last years. For example suffering from losing time in developing, accidents occur which put human life in danger. Our country Egypt has suffered in the past years from a lot of train accidents, which caused deaths of many citizens. Press (2019), stated that reporting from Cairo the capital of Egypt, A huge accident results in catching fire in two trains conducting due to speed which the locomotive slammed into a barrier and exploded inside the Egyptian capital's rail main train Ramses station, killing at least 25 people. This project will solve a big part of this problem by making the train automatic shuttle, and travel between the stated stations automatically stopping in the station without need to control from the driver and also start move without any help.

“Be My Eyes”

Prepared By:
“Amira Hassan Nasr” “161101”
“Salma Ahmed Hamdy” “160913”

Supervised By:
“Dr. Ahmed Diaa”

Abstract

There is a huge number of visually impairment that reaches to around 2.2 billion which is a very huge number. They face a lot of difficulties like the feeling of insult from some people. They used a very traditional solution like using sticks or guided dogs or even asking for help from volunteers. The proposed system make the blind person move without the need of any external assistants because of having two cameras located at a head mounted cap connected to earphones that tells the blind about every obstacle in front of him/her. First the stereo web cameras take the image in front of the user and transfers it to the cloud vision API then this google service will analyze the image and send the resulting information to the raspberry pi, The acquired information from the cloud vision is then combined in order to tell the user about the distance as well as the kind of the objects in his field of view, after that this information will be converted into speech by using text to speech API through the earphones.

“Biometric Attendance System”

Prepared By:
“Mostafa Mahmoud El-Sayed” “164199”
“Ahmed TahaAbd-El Galel” “164979”

Supervised By:
“Dr. FathyZaki”

Abstract

Many academic organizations around the world are worried about the participation of individuals because this has an adverse effect on their overall performance. Student attendance in conventional methods is taken by calling out the names of students or signing on paper which is extremely time consuming. To overcome this problem one of the solutions is a biometric-based attendance system using facial recognition that would be able to automatically record the students' attendance by facial recognition. Biometric attendance system using facial recognition is regarded as one of the most reliable, efficient and accurate biometric identification system. There will be a laser module in the proposed system responsible for counting the students attending the class and send their count to a PDA device with the supervisor.

“Cancer Detection with Deep Neural Networks ”

Prepared by:

Amina El-Haggan 162329

Mariam Mohamed 160329

Supervised by:

Dr. Mohamed Gamal

Abstract

Cancer is a severe life-threatening disease. It is one of the most dangerous and mortal diseases in the world. In this study, The main objective is to identify nodules smaller than 3 mm for the earliest possible detection of cancer. LUNA database comprising an image set of CT scans documented for lung cancer. The presented CAD system includes image reading CT, image preparation, detection and classification of the nodules. The crops then join a system of two CNN 3d. The first is a binary nodule classification then second is for malignancy classification. In both classifications a set of architectures are used. The "Googlenet" Model has the highest accuracy for the nodule detection. While for the malignancy level classification "Lenet" achieves the highest accuracy.

“Car Security System”

Prepared By:

“Ali Hesham Ali El-Hawary” “140883”

“ZiadHeshamAbd El-Rahman” “132831”

Supervised By:

“Dr. Mohamed Samir”

Abstract

The problem of car thefts has been around for many years, people have been struggling to find an infinite solution to stop these thefts completely. But unfortunately they couldn't find a definite solution. they came up with ways to try to secure their cars but still it wasn't efficient enough and cars were still being stolen. so we decided to come up with a solution that makes it near impossible for thieves to break into cars or steal them. We provided more security by using a multi stage authentication security system.

“Cardiovascular Disease Detection using Deep Learning”

Prepared By:

“Samar Sameh Mohamed” “164955”

“HebaKhaledHamza” “165589”

Supervised By:

“Dr. Mohamed Gamal”

Abstract

Cardiovascular diseases (CVDs) are the number one cause of death worldwide, according to the World Health Organization (WHO), more people die globally from CVDs than from any other cause. In the ER, there are many medical professionals who may make a mistake and fail to detect a heart attack. Patients who undergo an undiagnosed heart attack or a delayed diagnosis often suffer more complications than patients who are diagnosed correctly. So the proposed project will help both parties, the patients and the doctors to detect their conditions earlier and faster than the manual traditional way.

“Deep Vehicle Detection”

Prepared By:

Ahmed KhaledMohamed ID:165287

Abdullah Ibrahim Ibrahim ID:164599

Supervised By:

“Dr. Mohamed Gamal”

Abstract

Living in 2020, the entire automotive industry concerns not only the autonomous driving, but also merge it with deep learning. For instance, one of the foundation concepts in autonomous driving is vehicle detection. In fact, vehicle detection is a substantial branch of object detection applications. We propose a project using deep learning for vehicle detection and Localization. Build on three stages to achieve the optimum and higher accuracy network.

“Deep Lanes: Lane Detection with Deep Learning”

Prepared By:

AmroMaged Al-Sananery 164395

Hussain Mohsen Yasseen 160753

Supervised By:

Dr. Mohamed Gamal Ibrahim

Abstract

In this work we have a tendency to propose and associate in Nursing in-depth exploration of the state of the art of end-to-end models for lane centering assist in autonomous driving. The target of this thesis is to work out the simplest deep learning design through the various choices projected within the literature and create a step additional up it. All in all, many of us die every year in road departure crashes caused by driver basic cognitive process. Lane detection systems are the safest means provided to avoid such accidents. The goal of lane detection is to detect lane stripes to warn drivers whether or not they are on the proper path or drifting off from their current path.

“Design a Bluetooth Beacon for Real-time Indoor Positioning System”

Prepared By:

MazenMostafaDawood151883

Supervised By:

Dr. Waleed Nabil

Abstract

Nowadays positioning systems becomes part of every person’s daily life. With GPS being the most dominant and known positioning system for most people and being integrated in all smartphones and most modern cars to help people navigate in outdoor environment. However, when it comes to indoor environment GPS can’t provide an accurate position of user. GPS signal tends to be weakened due to obstacles blocking line of sight between satellite and user’s device. With the need for indoor positioning system increased in recent years. Some companies start developing lots of techniques for accurately determine the location for user in indoor environment whether using Wi-Fi, Bluetooth, ultrasonic or infrared and many more. The proposed system provides users with location in indoor environment using Bluetooth signals using beacons distributed across the specific building to provide full coverage of the building and be able to reach to any user enter the building

“Design and Implementation of Wide Band Two Way Power Divider Based on Meta materials”

Prepared By:

Ahmed EssamAwwadAly 150117

Mohammed EssamAldin 151667

Supervised By:

Dr. Ahmed Fawzy

Abstract

A power divider is a passive device that is used to divide an input signal into two or more signals of lesser power. A divider can have at least three ports, and is preferred to be lossless. Power dividers often provide in-phase output signals with equal ratio division ratio at 3dB, however, unequal division ratios can still be achieved. The phase shift of any hybrid network has the value of 90° or 180° between output ports. In this thesis, a new design for a metamaterial power divider using new techniques to relate it with a compact size related to the traditional power dividers for microwave applications.

“Design and implementation of DS spread spectrum Transceiver”

Prepared By:

“Mohamed gamal Aly” “160665”

“Mahmoud Hesham” “161807”

Supervised By:

“Dr. Kamel Abdel Fattah Mohamed Soliman”

Abstract

In communication field, some problems faces the communication signals and causes lack of efficiency in the communication between transmitter and receiver and these problems are interference, jamming, privacy and security, so some techniques are used to avoid this communication problems one of them is spread spectrum. These problems face the military association and civilians association and companies, So Spread spectrum is used to achieve security and jam resistance in military communications and privacy.

DSSS is used in the proposed system to achieve high quality of communication between transmitter and receiver by multiplying the input digital data with spreading code known for both the transmitter and receiver to disperse the signal at the receiver to retrieve the original message..

“PCB fabrication desktop machine”

Prepared By:

“Mahmoud Abd-El Azeem” “145225”

Supervised By:

“Dr. FathiZaky”

Abstract

Engineering students face many problems while they experiment prototyping PCBs as consuming a lot of time, as well as the need of many components while doing big effort which needs a lot of money for each board. so this machine will solve a lot of these problems and save time and effort while fabricating PCBs. The proposed system consists of a machine that will take several steps to accomplish first by doing a design of main circuit board to operate the machine, get a UV laser light for printing the circuit on a UV coated copper board, design a software program in order to convert the image file to a design file that the machine can read. after that implement and design the hardware mechanical body.

“Digital Wireless Audio Transmitter”

Prepared By:

“Abdelrahman Mohamed Ahmed” “152575”

Supervised By:

“Dr. Mohamed Samir”

Abstract

Engineering is the way for developing the whole world. More achievements done means more modern, safe, and comfortable life for people. Also, this changes the world's economy. Choosing of digital modulation scheme used in a certain application depends on modulation process's performance. The parameters in the application of different communication settings need to set different performance parameters to its priority. As wireless communications require spectrum-efficient modulation and demodulation schemes with limited conditions bandwidth. A modulation scheme that requires the least power to transmit information, and a modulation scheme with the smallest bit error rate is provided at the receiver. The modulation scheme and the relationship between the parameters will allow designers to make informed choices in the area of best digital modulation scheme for use in a specific application. This applies to the whole transmitter part including MICs, ADCs, and Amplifiers.

“Diagnosing Malignant versus Benign Breast Tumors”

Prepared By:

Nada Magdy Hussein 161329

Ali Maher Sayed 161203

Supervised By:

DR: Mohamed Saeed Darweesh

BSTRACT

However, the prediction of the tumor in early stages will give a better results. As this can be achieved by several methods and screening techniques that will be presented in this paper and showing the pros and cons of each of them. Mammograms used to check for breast cancer in females who have no signs of the disease by using x-ray imaging technique. Thus thermography imaging technique depends on the fact that the temperature variation which is considered as an ideal marker for scanning part, as well as breast cancer region temperatures are hotter than the surrounding normal tissues. In addition, B-mode (ultrasound) and elastography are produced by using two separate different materials gel and oil between an ultrasonic imaging device transducer and the patients breast tissue. Finally, after collecting a group of data set of each one of those screening techniques it could be applied to image processing to obtain the breast cancer features and assist in detection and prediction.

“Early Deep Detection for Diabetic Retinopathy”

Prepared by:

AbdelrahmanMedhatElzennary 161813

Mostafa Ali Soliman 161717

Supervised by:

Dr. Mohamed Gamal

Abstract

Diabetic retinopathy (DR) is a diabetic condition that affects the eyes and it could lead to blurry vision or complete vision loss. The main objective of this project is to build a reliable and computationally efficient deep learning model for the automated DR diagnosis. In this thesis a computationally efficient deep learning CNN is presented based on the DenseNet-121 neural network architecture that provides very deep CNN with lower computational resources using the concept of transfer learning. The proposed deep learning model is trained and tested using the commonly used labeled retinal images data set and the cloud GPU provided by the community of data scientists and machine learners, Kaggle

“Electronic Identification Card Based On Digital Signature”

Prepared By:

Mahmoud Mohammed Shakeeb 155729

Ahmed Mohamed Arfa 162001

Supervised By:

“Dr.Ghada Abdel Mouez”

Abstract

For sure individual identification is needed in almost every place that requires high level of security. It helps in many ways whether it's for civilian, educational, driving license, health conditions, or career reasons. As a result, specialists over the time tried many methods for individual identification but most of them are still vulnerable to security threats. All of that leads us to our system which is Electronic ID Based on Digital Signature. It focuses on having all the information related to the owner in one card like civil, labor office, health, crime record, and bank information. All of that is done by gathering all the information, coding them using a coding language (Python), connecting this information to special digital signature and then putting that in an electronic card (using QR code method).

“Empowering People with Disabilities using Robotic Arm through EOG-eye Control”

Prepared By:

“Amira Elhamy Mohamed” “164647”

Supervised By:

Dr. Ahmed Diaa”

Abstract

A physical disability is any condition that affects the physical function of the legs, joints, or gross motor skills. Helpful technology could be used to overcome these disabilities as it encourages people to accomplish more difficult tasks and improve or change methods of interaction with technologies. This paper introduces two paradigms to track the robotic arm by integrating Electrooculography (EOG) and Electromyography (EMG) imaging techniques. The research seeks to build a realistic approach to support disabled people fulfill their daily needs. The robotic arm is controlled using EOG to the desired location, the end-effector (clamp) is directed to the chosen location to grab the item.

The proposed system consists of an EOG circuit and a robotic arm associated with a camera, HD display and a grip connected to its end effector. The arm movement controlled through EOG probes, and to make the system efficient the camera and the display work as a confirmation system powered by Google Cloud vision API to give the user choices in case of multiple identified objects

“Optimization of Energy Consumption in Houses”

Prepared By:

“Abdlrhman Ibrahim Hussein” “155177”

Supervised By:

“Dr.AhmedDiaa”

Abstract

Electricity Consumption is a great problem which all the world suffers from it. In this project it will take the sector of the consumption in houses and try to solve these problem by making a system to manage the source of the entrance power and add a new source of power which is solar cell power which could be putted in any house and add a standby power to the system due to the probability in many times to the power outage, and try to decrease the consumption in the house by taking the lighting sector to decrease its consumption by adding a sensors in every part of the house to get the benefits from every unused time to the lights and also control the intensity of lights during the day and night. This project also give the user a continues status for the power consumption on an LCD and give a warning by LCD and Buzzer if the consumption increased. This features could decrease a part of consumption even if it is little but we could earn the benefits of the saved power.

“Home Security System”

Prepared By:

Marawan Mahmoud Anwar 160001

Mohamed AdlyGhazaly 160271

Supervised By:

Dr. FathyZaky

Abstract

Home security has been and will always remain a huge concern for the public. Studies have shown that in 2015, a crime happened every thirteen seconds. People have opted to reach out to home security companies and this solution has been very expensive since it requires monthly subscription fees and installation fees and even some companies charge fees for maintenance. In this project, a reliable and convenient system is introduced. The main target is to implement the system with a significantly lower cost and add more security features compared to the systems in the market. Applying the proposed system results in a significant reduction in expenses and reliability in terms of threat detection, comparing with the features of the traditional security systems available in the market.

“Intelligent Agriculture Disease Detection Based On Machine Learning”

Prepared By:

“Ahmed AbdelhadiTaha” “164157”

“YoussifAmr Mohamed” “160627”

Supervised By:

“Dr. Mohamed saeed”

“Eng Ahmed Mahmoud”

Abstract

The world population depends heavily on the agricultural products for survival as source of their food. According to the FAO, 60% of the world’s population depends on agricultural products for survival. According to reports by UC Agriculture and Natural Resources scientists, 10 to 40% of the losses are due the diseases and pests affecting crops. The aim of this project is to introduce the technology of deep learning into the field of agricultural disease detection field. Despite the use of other techniques which involve human to manage, The Idea is to automate the process of detecting those diseases using deep learning technology and managing them before any significant losses using only images from the field only.

“Intelligent Crash Avoidance System For Road Intersection Based On Machine Learning”

Prepared by:

Hania Ahmed

Ramy Mohamed

Supervised by:

Dr. Mohamed Saeed

Abstract

Car accidents became one of the biggest problems in our world, the number of deaths caused by car accidents has increased in a scary way in the last years. So in our proposed system we will work on increasing the accuracy of detecting different types of road intersections. And we will use computer vision techniques and deep learning algorithms to detect road intersections trace signs using convolution neural network. And also to design a real time decision maker to avoid collisions in road intersections

“IoT Based Automatic Vehicle Accident Detecting And Rescue System”

Prepared By:

Ahmed Ibrahim Abdelrafeh 136725

Mohamed Hossam 153035

Supervised By:

Kamel Abdel Fattah

Abstract

In highly populated Countries like Egypt, everyday people lose their lives because of accidents and poor emergency facilities. This project express to provide a solution for such a problem we are going to proposed an IoT system which instantly notifies the Public Safety Organization (PSO) headquarter whenever an accident takes place and pinpoints its geographic coordinates on the map. When an accident takes place, a vibration sensor detects it. Then, an algorithm is applied to process the sensor signal and send the geographic location along with some medical information of passengers to the server, indicating accident occurrence. Server will forwards the details to nearest rescue teams.

“IoT Based System Agriculture”

Prepared By:

Ali Mohamed Hussein HusseinKamel 143071

Ahmed Adel AbdelhamedElsayed Ali ElMenshawy 154363

Supervised By:

Dr/FathizakiAmer

Abstract

As the world is trending towards new technologies and implementations it is anecessary goal to trend up in agriculture too. Many researches are done in the field of agriculture and most of them signify the use of wireless sensor network that collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity .Hence, automation must be implemented in agriculture to overcome these problems. In order to provide solution to such problems, it is necessary to develop an integrated system which wills improve productivity in every stage. But, complete automation in agriculture is not achieved due to various issues.

“Mind Controlled Wireless Robotic Arm Using Brain-Computer Interface”

Prepared By:
Nada Moukhtar 162515
Supervised By:
Dr. GhadaAbdelmouez
Abstract

Among the previous studies of the world health organization there are about 10million amputees worldwide 30% out of them are arm amputee. Arm amputation is a huge disability so if someone lose one for less both it is harder to do things we physically need to do because we interact with the world with our hands and when they are missing it is difficult to regain your independency without expecting help from others or looks of misery. The thesis of this project provides a brief clarification of Machine learning algorithm called Random Forest (RF) to classify EEG signals and show how to design and train these for EEG decoding with high accuracy 80.7% and how to visualize the informative EEG features. Then the processed commands are recognized by the micro-controller to activate servo motors to control the robotic arm. Also, the mind controlled robotic arm can be used in different fields, such as industrial, educational andmedical field

“Monitor and Control of Greenhouse Environment”

Prepared By :
“Ramez Ashraf Maher Saad” “160227”
“AbdelrahmanSamyAbdelgilil” “160403”
Supervised By:
“Dr/Maher EL Tayab”

Abstract

In Egypt approximately 70% of citizens are depending on agriculture, annual income of citizens obtains from agriculture. In today’s digital world many farmers are still using traditional methods in their field so; yield of plants is very less. The main objective of this project is to develop an Embedded System for plant monitoring and watering system using Internet of Things, Raspberry Pi as Processor, and sensors for sensing environmental conditions. The system monitors different parameters like Temperature, Humidity, Soil Moisture, gas, fire and colour sensor. The water pump fixed in the field operates both manually and automatically depending upon Moisture sensor results in soil. Water pump automatically switches between on and off stage of pumping action

“Monitoring and Controlling Smart Tank using IoT”

Prepared By:
AbdelRahmanMostafa 151543
Mohamed Ahmed Atef 153405
Supervised By :
Dr. Hossam Abdel Aziz
Abstract.

The Internet of Things is a robust network of devices, all embedded with electronics, software, and sensors that enable them to exchange and analyze data. Firstly, a centralized hub is used for distributing water individually based on the needs of each household. The centralized hub works with the help of IoT that assists in integration of communications, control, and information processing across the systems used. This allows us to sense the water quantity and quality at each structure in one particular sector and provide control of water supply through a remote access. According to the deficit or the excess water level in a tank, the centralized hub monitors and shares the water among the localized tanks or resupplies water from its reservoir. It is used to create personal area networks in this scenario where there is a need for wireless connection across the system. In this project we present the idea of smart water tank management system operated with Raspberry pi microcontroller, which is the prime component of this project.

“IOT Multi sensors system to enhance railways safety”

Prepared By:
Ahmed Abdelrahmanmohamed 160645
Adhamsameh 164155
Supervised By:
Dr.FathyZaki

Abstract

In our country Trains travelers have constantly confronted perilous factors and dangers on the railroads. There have consistently been endeavors to actualize new wellbeing measures and safeguards to shield important human lives from deadly train mishaps and to diminish a wide range of interruptions that the train is presented to on the railroad. All things considered, those endeavors and security measures are as yet missing and have far to go. The proposed framework not just beats these imperfections, it likewise enhances them and includes new highlights that were never present in any framework and expands security measures for railroad frameworks radically.

“PEDESTRIAN DETECTION USING DEEP LEARNING”

Prepared By:
AHMAD AKRAM 161593
AHMED KHALID 160729
Supervised by:
Dr. Mohamed Gamal

Abstract

Human detection technology plays an irreplaceable role in many important areas such as autonomous driving and surveillance. In recent years, human detection is still a very difficult task because it is merged in a lot of extreme challenges. Each individual has his unique appearance and body shape. At the same time, humans can perform various amount of gestures. Compared with the traditional method, the deep neural network has the advantages of higher accuracy, shorter computing time and easier operation. Therefore, deep learning model have been widely used in different detection scenarios. This thesis deals with pedestrian detection using convolutional neural networks which is the most advanced available technology from the perspective of autonomous vehicles

“Real-Time Depth Estimation and Lane Detection System Based on Machine Learning”

Prepared By:
Omar HanyFathyAbdelgawad 164529
Hazem Ahmed Ibrahim 160465
Supervised By:
Dr. Mohamed Saeed

Abstract

This project aims to help the driver and autonomous vehicles systems to merge with the road environment safely and ensure the reliability of these systems, it also provides assistance to human-driver to reduce the road crashes and overcome the automobile-related deaths that occur every day around the world. The project targets the software approach by using fewer hardware sensors, so the project built upon NVIDIA Jetson Nano GPU kit. The proposed system was built to help drivers by makes early warning if there are any expected danger and provides the actions needed e.g. (steering and speed) to keep the car moving in the standard safe mode, so our end-challenge is to combine these algorithms with deep learning network in a real-time reliable system

“Real time Automatic Wireless Health Monitoring System”

Prepared By:
HossamMedhat Hassan 161459
Islam Ahmed Abd-Elhakam 163737
Supervised By:
Dr. Maher El-Tayeb

Abstract

Society suffers from many diseases that can cause people to die within minutes from oxygen-blood deprivation due to severe heart rate and temperature slowness. Traditional approach can lead to a heart failure unexpectedly, this problem occurs especially in older family members over 65 years of age and for newborns who need a home or hospital nurse to take care of them, so the patient pays a lot of money and usually needs a routine check of the blood oxygen level, pulse speed and temperature as any difference in them can threaten the life of the person. There are two fundamental issues associated with this approach. Firstly, the healthcare professionals must be on the patient's site all the time and secondly, the patient must remain admitted to a hospital, wired to biomedical tools on the bedside for a period of time. Our proposed system will solve these problems by means of an integrated device that combines three sensors: temperature sensor, heartbeat sensor and blood oxygen sensor.

“Realization of Indoor Visible Light using Li-Fi”

Prepared By:
“AyatMomen Abo El-Maged” “151125”
“NourhanMostafaZaghloul” “134795”
Supervised By:
“Dr. HossamSelmy”

Abstract

Tourism is a very important source of income to Egypt. The country that has more over than five thousand years BC of pharos history and 34 major museums all over the country fulfilled with the valuable cultural monuments from multiple cultures such Greek, Roman, and Christian civilizations, and also a huge heritage from ancient Egyptian antiques. No wonder This puts Egypt at the top of the list of tourist attraction places by 8.3 million tourists in 2017 only. Although Egypt witness growth in tourism industry, statistics showed that number of tourists who target museums decreasing year after year. The purpose of this project is merging and filling the gap between the culture heritage of the ancient civilizations and today's technology represented in internet connection, informational abundance, and smart devices. By using the new technology (LI-FI) the Egyptian museums will be able to evolve itself and enhance the showing system inside, and this will reflect on the number of visitors.

“Safety and Health device”

Prepared By:

Amira Ashraf 160591

Nada Mohamed 160139

Supervised By:

Dr. Mohamad Samir

Abstract

Safety and health are entwined concerns, and both are treated as necessities in most people's lives, and addressing it is extremely important especially when we are talking about Women, kids, and elderly. It was proved that the percentage of women harassed and attacked is gradually increasing and little to nothing is done about it. Moreover, most assaulted women are no longer reporting the incidents which only results in them increasing. Equally important is child care and how kidnapping children is every parents' worst nightmare. Egypt abduction rate is increasing annually and has become so common to the point where parents would not let their children out of their sight. Furthermore, elderly care is always a huge concern in every family, where time to time, most elders insist on living alone, their children always worry that they will not be fast enough in case of an emergency. The proposed device would be in the shape of a bracelet and would be aided with features that would cover different scenarios with different user needs.

“Autonomous Fire Fighting Robot”

Prepared by:

Mohamed Osama

Mustafa Hisham

Spervised by:

Dr. Mohamed Saeed

Abstract

The field of firefighting has been dangerous. Additionally, The traditional ways applied are inefficient and depending mainly on humans in firefighting. Even no matter how they have been trained, they are not Infallible, and here raises the importance of finding new methods to save humans' life. One of them is to use robots instead of humans which becomes recently a trend to handle fire accident hazards. The reason to choose the robots because they have resistance in this kind of dangerous situation which is not suitable for any individual to include themselves in. So, in our project. We develop a full automated firefighting robot that can locate and extinguish a fire in each environment. The robot navigates the arena and avoids any obstacles it faces in its excursion..

“Smart Home Automation”

Prepared By:

Abdelrahman Mohamed AbdelhamidAtris 162933

Mohamed KhalifaMahammoudHussien 142459

Supervised By:

Dr.FathyZaky

Abstract

This project presents a prototype and design implementation of an advanced home automation system that uses Wi-Fi technology as a network infrastructure connecting its parts. The proposed system consists of two main components; the first part is the server, which presents the system core that manages and controls a user's home. Users and the system administrator can locally (Local Area Network) or remotely (internet) manage and control the system. The second part is the hardware interface module, which provides an appropriate interface to sensors and actuators of the home automation system. Unlike most of the available home automation systems in the market, the proposed system is scalable that one server can manage many hardware interface modules as long as it exists within network coverage. The system supports a wide range of home automation devices like appliances, power management components, and security components. The proposed system is better in terms of flexibility and scalability than the commercially available home automation systems.

“Smart Office”

Prepared By:

Khaled Omar Salman 154891

Mohamed BelalShokeir 155809

Supervised By:

Dr. FathyZaki

Abstract

The development of the Internet of Things will revolutionize a number of sectors, from automation, transportation, energy, healthcare, financial services, and agriculture. IoT technology can also be useful to build a new model and wide spread progress for smart homes to provide intelligence, comfort and to improve the quality of life. Automation plays very important role in our lives. It makes the work easier and simpler so for simplified and easy living, Smart office automation system is designed in this system. This system is based on subsystems like lighting, heating. Security and alarming systems are also present. The project presents the design and implementation of innovative office system for monitoring and controlling the electrical appliances using internet of things technology. The devices can be controlled using IoT platform phone via Wi-Fi communication protocol and android application. The proposed system monitors and controls the office appliances via smart phone using Wi-Fi internet connection and raspberry pi as server system.

“Smart Restaurant”

Prepared By
“Ahmed FahimElharty” “153627”
“Mohamed Ahmed Ammar” “142659”

Supervised By
“Dr. FathyZaki”

Abstract
With the spread of technologies people seek for better and faster services especially catering services at the restaurants, as the traditional catering services has a lot of problems that make the customer unsatisfied, also it cost the restaurant more money. So the proposed solution will overcome all of these disadvantages as the proposed system depends on the QR technology, as each table in the restaurant has a QR code printed on a paper and each QR code is unique. This system operates when the customer scans this code from his/her mobile phone. It will direct him/her to a web page application for the restaurant, so he/she can make the order through it. That's why each QR on each table is unique, to be able to locate the table that made the order. So by using this method the proposed system we overcame the previous solutions' disadvantages because the system doesn't require any hardware so it's not costly and the system is compatible as the system operates on any mobile phone

“Traffic Sign Recognition System”

Prepared By
Abdullah SamehBakeer 165617
Amr Nasr Eldin Othman 132657

Supervised By
Dr. FathyZaky

Abstract.
Autonomous driving systems require special handling of input data: there is no time for complex transformations or sophisticated image processing techniques, they need a solid and real-time analysis of a situation. While numerous solutions have been published, solutions are tested on autoways, country-side, or at a very low speed. In this paper, we give a short overview on main problems and known strategies to solve these problems, and we give a general solution to tackle real-time issues in urban traffic sign recognition. The project utilize the Raspberry Pi Single Computer Board (SCB) as Image Processor Unit (IPU) as well as microcontroller. The proposed system will be connected to the RF receiver that will receive a identified signal for each traffic sign and differentiate the signs from each other. Moreover, the system will use the camera module to perform image processing to detect the traffic sign and recognizing it.

“Vehicle to vehicle communication using visible light”

Prepared By
“Abdullah Khaled” “160615”

Supervised By
“Dr. HossamSelmy”

Abstract
Connected Vehicle (CV) is a motorcar which communicates with its interior and exterior surroundings. Connected vehicle relies on localized vehicle-to-infrastructure (V2I) and vehicle-to-vehicle (V2V) to support safety, quality and environmental. This report present a method of vehicle-to-vehicle (V2V) communication system supported an optical wireless communication technology mistreatment a semiconductor diode transmitter and camera receiver. The report at first provides an over view of the problem. It present the visible light technology used for wireless Communication automation. Automotive Wireless Communication provides drivers a sixth sense to apprehend what's happening around them to assist avoid accidents and improve traffic flow. This report introduces example of an already existing system examples, then it present the system that should be constructed during gradII. Finally, the paper is summarized

“Wearable Antenna For Health Monitoring”

Prepared By
Mohamed Amrgamal 161525

Supervised By
“Dr. Mohamed Ismail ”

Abstract
Utilization of wearable textiles within the antenna section has been seen on the increase thanks to the recent mini turisation of wireless devices. A wearable antenna is supposed to be an area of the article of clothing used for communication functions, which incorporates following and navigation, mobile computing and public safety and used for health observance. Advanced info and communication technologies, providing anyplace and any-time property, play a key role within the development of a fashionable care systems varied on-line systems for observance. This sort of solutions are terribly helpful particularly once a treatment includes observance of some important parameters for long amount of your time. Remote observance of the aged in telehealth applications needs that the observance should not have an effect on the elderly's regular habits. To confirm this demand, the elements (i.e., device and antenna) necessary to hold out such observance ought to mix in with the elderly's daily routine

“Weather Monitoring System”

Prepared By

AbubakarAbdiDirieEgal 161605

Supervised By

Prof. Dr. FathyZaky

Abstract

Weather monitoring and prediction has been and will continue to be important to manin their day to day lives. This goes for all countries and all continents, from the Africa’s and predicting famine due to severe heat to the Asia’s where flood prediction due to heavy downpours is essential. Although man has accomplished great feats in the field there are still major concerns surrounding it and many improvements to be made. Humans in all environments, from the hustle and bustle of larger urban cities as well as those living in themore serene rural areas plan their daily lives around current weather conditions. Unexpected catastrophic weather and inaccurate weather predictions have led to the downfall of many cities causing huge losses in wealth, resources and even lives. A major reason is due to the use of polar satellites and or geostationary satellites as weather monitoring satellites. Both geostationary satellites and polar satellites can be extremely inaccurate in its weather findings which can cause great harm. Throughout the decades and millenniums people have tackled weather monitoring issue in various manners and the greatest feat achieved was and currently still is the weather satellite.

“Early Earthquake Detection with Deep Neural Networks”

Prepared By

ya Emad Ibrahim 161999

Marwa mahmoud Abdallah 162577

Supervised By

DR. Mohamed Gamal

Abstract

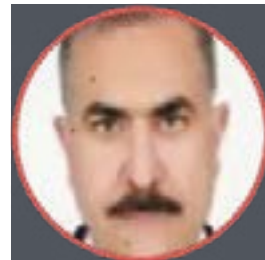
Deep learning and machine learning have made great progress in several areas of artificial intelligence and shown promise in application of geo science. For seismic data analysis, the efficiency becomes important due to the rapidly increasing volume of seismic data. Nevertheless, deep learning technologies show strong adaptability and generality for feature extraction. Over the last decades, the volume of seismic data has increased exponentially, creating a need for efficient algorithms to reliably detect and locate earthquakes. Today’s most elaborate methods scan through the plethora of continuous seismic records, searching for repeating seismic signals. Our system with the aid of machine learning and CNN module can detect the earthquake and we will try two solution .Then we choose the best solution based on the highest prediction accuracy.

INDUSTRIAL DEPARTMENT

2019\2020



RESEARCH + PUBLICATIONS



Sameh Ahmed Salah
Lecturer

1. " Waste reduction by linear programming optimizing",
18th International Conference on Aerospace Sciences
& Aviation Technology, ASAT 18, April 9 - 11, 2019,
M T C, Cairo, Egypt.

2. " USING SINGLE MINUTE EXCHANGE OF DIE TO REDUCE CHANGE-
OVER TIME: CASE STUDY"
ISER International Conference on Science, Technology, Engineering
and Management (ICSTEM-2019), Washington DC , United States of
America, 21st-22nd July, 2019...

STAFF PROMOTIONS

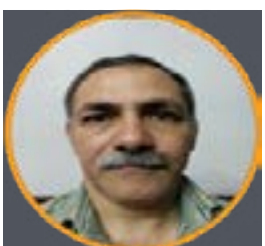
PH.D DEGREE CANDIDATES



Ahmed Mohamed Akram
University of Greenwich, London, U.K

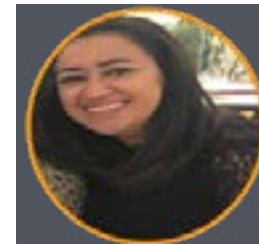


Ghofran Mohamed Jan
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Eng. Yasser Mohamed Abdelhalim
Faculty of Engineering, Benha University



Eng. Shireen Ibrahim Bishara
Faculty of Engineering, Alexandria



Eng. Omnia Reda Mazroaa
Faculty of Engineering, Cairo University

MSC. DEGREE CANDIDATES:



Eng. Ahmed Maher Khairy
Masters of Science in Mechanical Engineering
Cairo University

CERTIFICATES AWARDS



Skills Academy

IBM

This document certifies that
Yasser Safan
 Successfully passed the IBM Academic Certificate exam for
Artificial Intelligence Analyst 2020 Mastery Exam
 This achievement also earns you a Mastery Award Badge which you can accept from Acclaim



28 July 2020

UNIQUE ID: 4934-1595-9508-4254

Takreem
 Takreem El-Tokamy
 General Manager
 IBM Middle East and Africa

Dr. Naguib Attia
 Vice President
 Global University Programs
 IBM USA

STUDENTS ACTIVITIES

1- Graduation projects

Graduation projects are focused on two main areas:

A. Industrial Engineering area:

In this area the projects deal with production enhancements in famous industrial factories and companies using different industrial techniques. After implementation of the proposed solution, the efforts are appreciated from the stake holders such as factories. Samples of the best projects which have been implemented are:

1. Waste Elimination in Food Manufacturing Production Line (Fall 2019)

The objective of this project was to reduce the waste in different aspects in **Edita food factory**. The problem that affect the productivity is the wastes in materials and products which has a high impact on the production line availability. The company produces variety of products and it have four production lines. The total of wastes in the production line of Mini Molto represent about 0.66% of total production weight, this ratio is divided into four types of wastes. This line produces 37800 Kg/Year of waste from the factory which is about 17.6% of the total waste in all production lines.

Implementing the Six Sigma DMAIC Methodology will reduce the waste in the main problem by knowing its main causes and control it. In addition, the estimated implementing of OEE methodology decreasing the down time for transfer machine by 25%, croissant machine by 60% and for injection machine by 25%. Implementing the solutions will improve the process and reduce the waste from 0.66% to 0.42% of total production which represent from 37800 Kg to 24054 Kg to save 13,745 Kg. The study resulted in reducing waste from 0.66% to 0.47% of total production which represent from 38700 Kg/Year to 29500 Kg/Year which saved about 9200 Kg/Year.

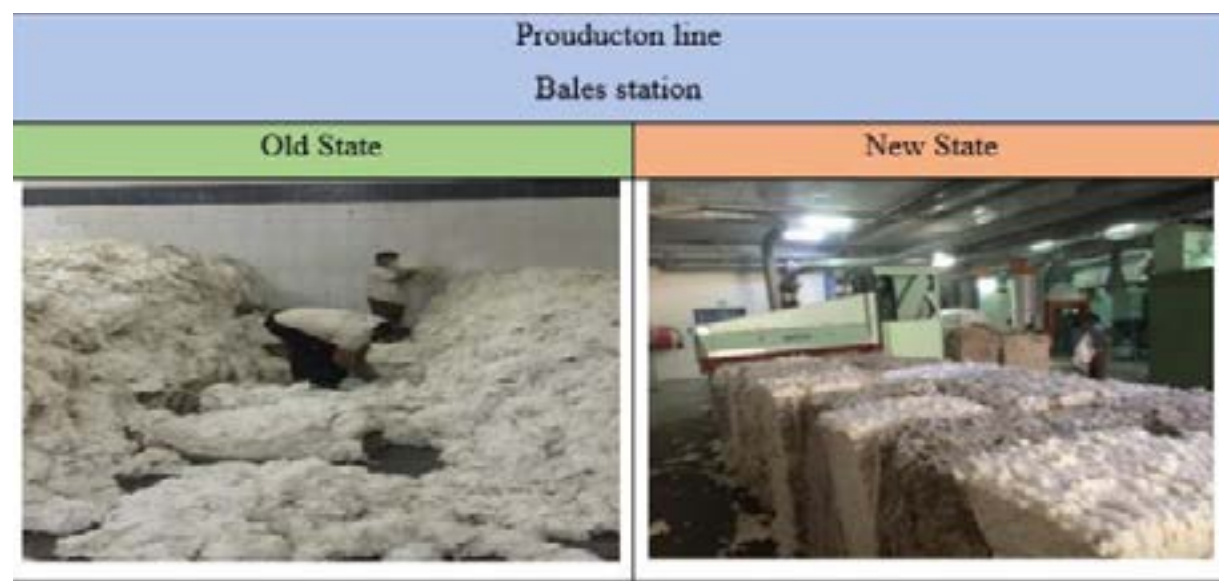
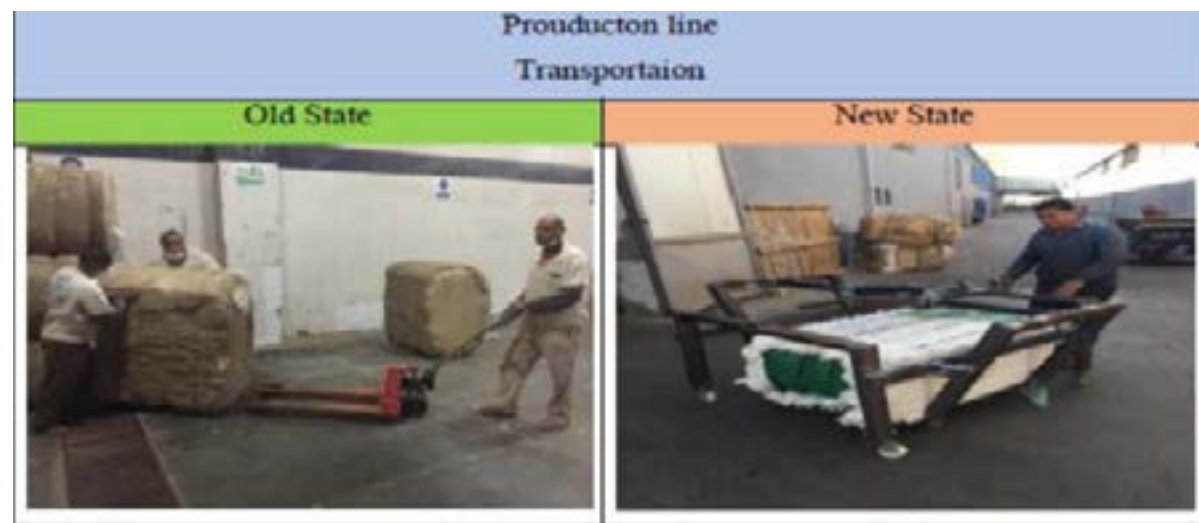


EDITA croissant machine

2. Developing a Material Handling System in a Textile Facility (Fall- 2019)

The objective of the study was to design different models of material handling systems in **Elshafee Textile Factory** to reduce the idle time, minimizing injuries risk, increasing the productivity and reducing costs. A study was also included to compare between three types of blow machines to upgrade the mixing and blow room department in the factory. After the designing phase, the best solutions were chosen and implemented.

The results of implementation showed that the productivity of the blow room increased by 20%, the idle time was reduced by 50% and the injuries were reduced as well.



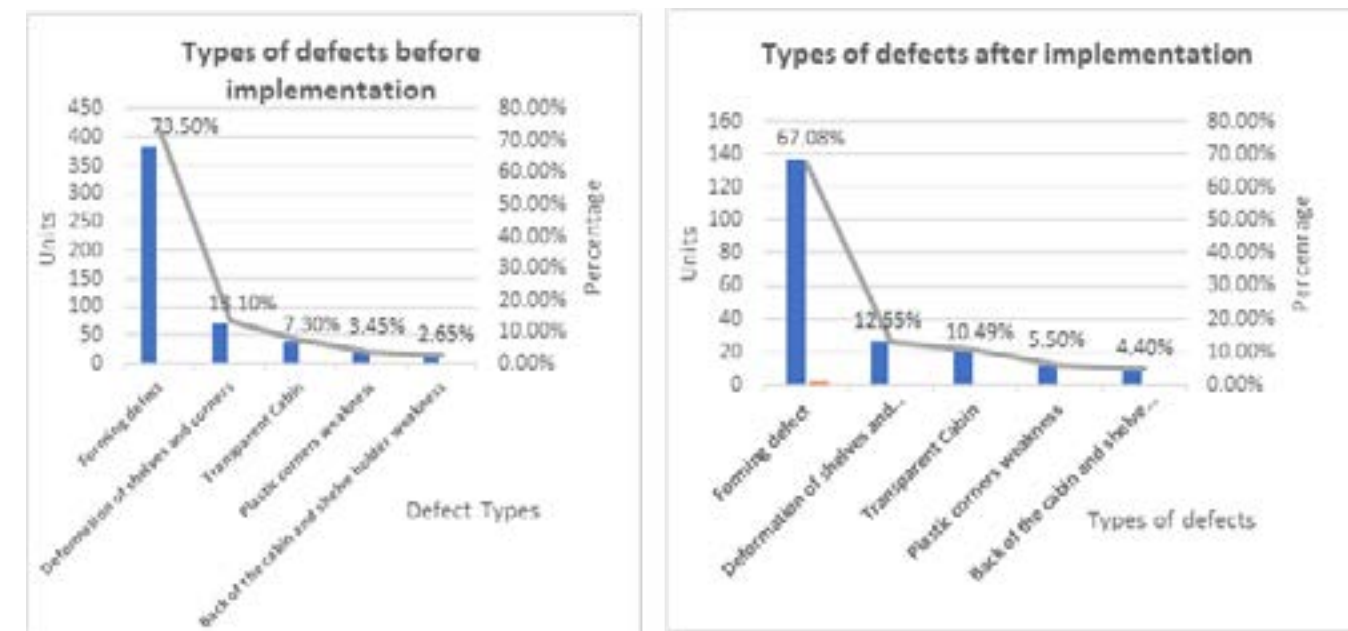
3. Waste Reduction in Refrigerator Factory (Spring 2020)

The project objective was to use Lean-Six Sigma methodology to reduce the different types of waste in **BAHGAT GROUP** refrigerator factory. All different types of products in the factory, and the production stages and their processes are identified. Different types of wastes percentages were calculated and analyzed for the department of thermoforming which is the initial department; responsible for producing cabins and doors for the refrigerator. Then a pareto chart was produced to calculate 80% of wastes. It was found that the most critical type of waste was defects. Furthermore, a fishbone diagram was implemented to determine the root causes leading to defects.

Study objective is to reduce the percentage of defects in the thermoforming department from 9% to 3% by dealing with three problems which are plastic problem, maintenance problem and media problem.

Solutions adopted in the Material problem decreased 4% of the 6% target reduction value of defects, while solutions adopted in the maintenance problem and the media problem decreased the defects by 1% and 1%, respectively to reach finely the 6% target value.

Results collected after implementing the three solutions were that the percentage of defects reduced from (9.22%) to (3.22%) of total production in addition to saving 4,179LE per month from scrap items and also saving 15,960 LE from energy savings per month.

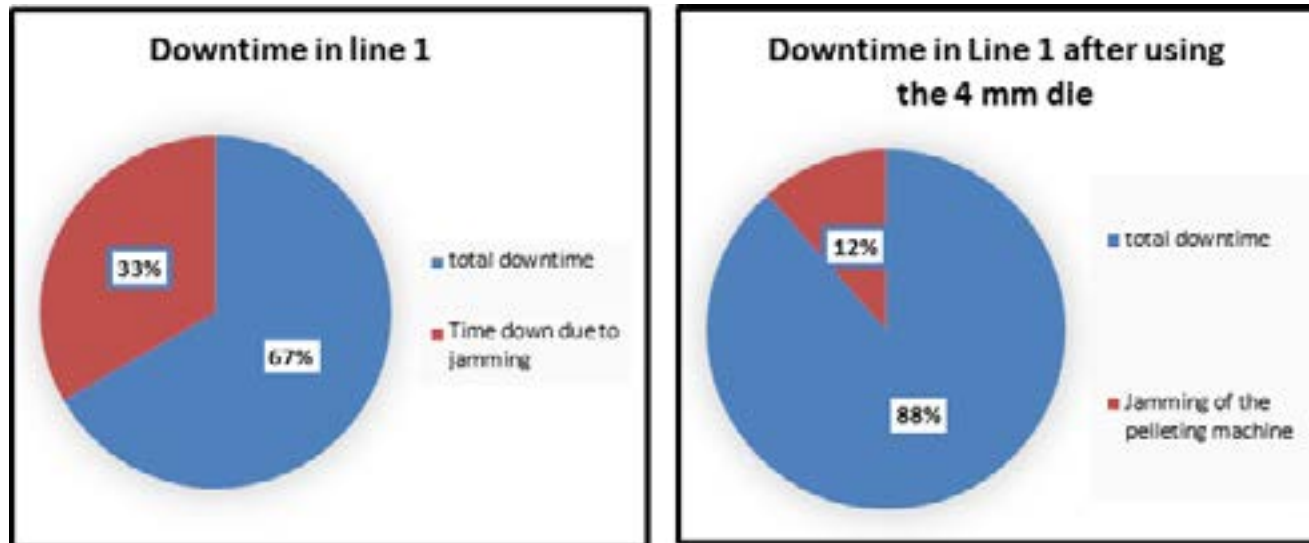


4. Process Improvement for Poultry Feed Mill (Spring 2020)

WADI poultry feed factory is one of the largest poultry feeds manufactures in Egypt. It manufactures more than 10 types of feed to cover the needs of **WADI GROUP own farms**, in addition to selling in the local Egyptian market. Poultry feed factories are responsible for producing animal feeds from mainly raw agricultural material and some nutritional vitamins. The purpose of the project was improving production rates while maintaining quality specifications of the poultry feed factory final products. The improvement approach was conducted by observing the parameters related to the main issue of productivity, followed by trials on the selected parameters.

The optimization of parameters was conducted through the use of Minitab and design expert software. The quality specifications of the improved productivity is measured for comparison setting a control plan for the optimal quality standards. Documentation of the analysis and experimentations was used for determining the best optimal conditions for improving the production capacity and the process line.

This decrease in downtime increases the productivity and decreases the losses that would have been encountered due to the downtime of the machines. The losses due to downtime decreased from the shocking 2,760,000 l.e in December to 600,000 in March 2020.



Downtime due to jamming before the change of dies

Downtime due to jamming after change of dies

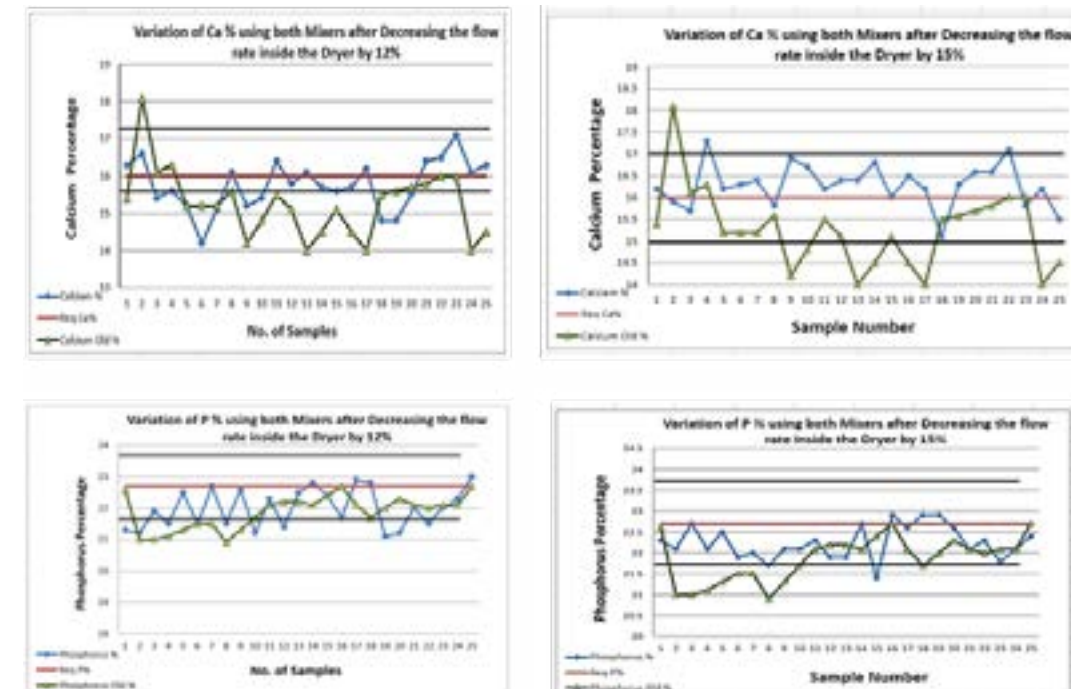
5. Enhancement of Poultry Feed Product Homogeneity (Spring 2020)

WADI Company is formed of group of different factories dealing with agriculture business industries since it started on 1984. One of the factories, located in Sadat city focused on producing small granules that contains Mono-Calcium Phosphate (MCP) as a main ingredient for poultry industry which is suitable for providing poultry with calcium and phosphorus that promotes forming hard backbone and skeleton.

The objective of this project was focused on improvement of the homogeneity and distribution of the calcium and phosphor ingredients in the final product by studying all parameters and factors that may create the fluctuation of their percentages. There are many factors that may affect the homogeneity of the final product such as the mixing system, the moisture percentage. So, many tests are conducted on samples taken in each stage of manufacturing processes, namely after mixing stages, after granulator and after drying processes.

The improvement of the drying process was carried out by increasing the retention time of the product inside the dryer and decreasing the speed of the dryer by 15% from 2.9 to 2.46 RPM which achieved improvement in the homogeneity in the final product.

Two improvements introduced to the dryer, one by reducing the speed by 12% and the second by 15%. Percentages of Phosphorus & Calcium are almost reach their best improvement when the speed reduced by 15%. Results showed that about 98% of Phosphorus and more than 96% of Ca achieved exact and within specification limits.



B. Mechanical projects area:

In this area the students are able to design and manufacture prototypes of machines they designed in different mechanical branches, environmental areas and renewable energy fields. Samples of the best projects are :

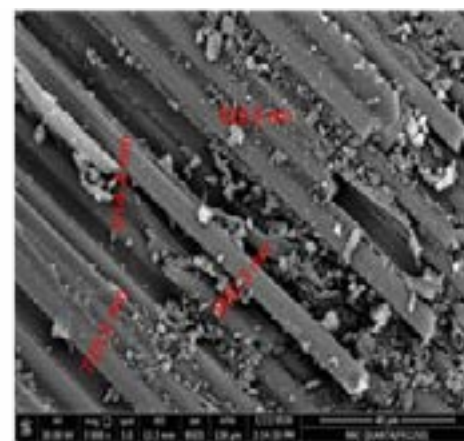
1. Enhancing of Toughness of Carbon Fibers - Epoxy Composites by Rubber Particles

(Fall 2019)

The main objective for this project was enhancing the toughness of carbon fibre epoxy composite by increasing the strain to failure with improved tensile strength by dispersing rubber particles into the epoxy. We have proposed a way of enhancing the carbon fiber-epoxy toughness by using rubber particles. After performing Tensile, test on the carbon fiber-epoxy with rubber particles in different conditions. It has been found that the optimum ratio of rubber particles to be add is 5%wt. This percent gave an increased toughness by about 22%. The morphological studies have performed using a combination of SEM where the results indicates the effectiveness of reaction and consequently the interfacial adhesion between the dispersed rubber particles and the continuous polymer domain.



Scan Microscope



Microstructure

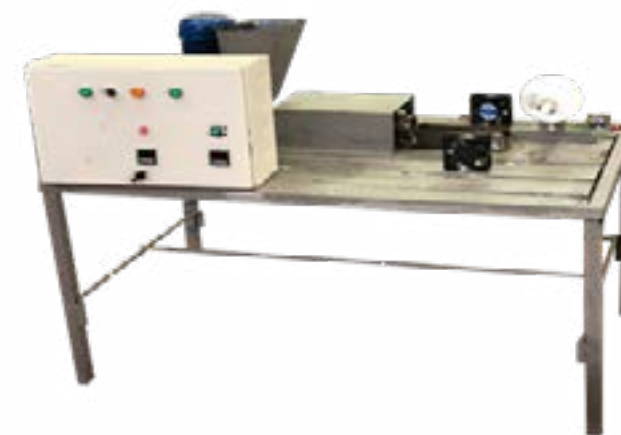
2. Design and Manufacturing a Prototype Machine for Production of 3D Printing Filaments Using Recycled Plastics (Spring 2020)

This project aimed at designing and manufacturing a prototype machine that was used for the possibility of producing 3D printing filaments from the recycled Polyethylene Terephthalate Polymers (PET/PETE) which is widely used in water bottles. The recycled plastics will be supplied in forms of pellets which is to be fed to the machine through a hopper.

The process consisted of two main stages, the first stage is melting of the pellets by heating at specified temperature and then the melt will be extruded through a die which has the shape of the required filament size. The second stage was the cooling and wrapping the output filament, in which the cooling will be executed by passing the continuous filaments in a cooling liquid such as water and then exposed to two side fans to complete the cooling process and the then rapped on rolls.

The output filaments will be used in a 3D printer to print tensile test specimens and some printed samples. The tensile test samples will be used to measure the properties, mainly the ductility, of the output filaments to be compared with the used filaments in the market.

The production of 3D print filaments may save lot of money and insure the concepts of green manufacturing system by producing a useful product with low cost and safe for environment.



Final shape of stand table



Final Product.

2- Field Trips

Graduation Projects students regularly visit the factories related to their projects (almost weekly) to collect data in the production lines and investigate the problems affecting the production rates and then specify the bottle necks. Under supervision of the Industrial Engineering staff, the analysis of the data are performed and suitable solutions are proposed and then implemented in these factories. The following are some of the awarded certificates from the factories and companies been visited and the problems of manufacturing are solved:



التاريخ : 2020 / 7 / 16

السيدة الخاضعة / أ.د. ناهد صبيح
عميد كلية الهندسة بجامعة أكتوبر للعلوم الحديثة والآداب
الاسم: أ.د. ناهد صبيح الخاضعة
اللقب: أ.د. ناهد صبيح الخاضعة

تحية طيبة وبعد

نود أن نشيد بالطلاب

- ماخذت محنتهم
- جاهدوا في مسيرهم

لتجنيدهم والالتزام في العمل والنشاط والجهود المبذورة في متابعة بحثهم العلمي في شركتنا الشركة المسوية للمصناعات المعدنية والحديدية "معدن مصر" حيث أننا قد سمعنا منكم كشركتكم على هذا المستوى من التدريس والمناهج العلمية المتقدمة للطلاب والتي يمكنهم من الوصول لهذا المستوى العلمي المتقدم - والذي يمكن إيجاباً على تحسين الأداء العام للمؤسسة عن طريق تطبيق خطة الإنتاج جيدة التي عليها تخفيض التكاليف وزيادة الربح - وذلك من خلال تنظيم نظام إدارة الموارد المتكامل (ERP SYSTEM) وتدريب الموظفين المتخصصين على إدارة هذا البرنامج وتنظيمه يحتاج

كما نشيد ونقدر جيد الكفاءة ومساهمتها في تطوير الصناعة في مصر.

ونأمل التقدير دعوا إدارة كلية الهندسة بالجامعة على هذه المساهمات من أجل تحسين المستوى العلمي للطلاب

وكذلك الاستفادة من الأفكار والتحديات العلمية للطلاب الأعضاء في الشبكات العلمية في المصانع المصرية.

مدير إدارة المصنع **مكتب رئيس مجلس الإدارة**
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الإدارة العامة لشؤون المواطنين
 شركة الوادي للأغلاف (ش.م.م.)

16/7/2020

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MSA
UNIVERSITY
MISA UNIVERSITY

AUG
Arab University of Science and Technology

خطاب من مصنع الإحلال العربي للزجاج إلى جامعة أكتوبر للعلوم الحديثة والآداب قسم الهندسة الصناعية
 تحية طيبة وبعد

يشهد مصنع الإحلال العربي للزجاج أن كلا من الطاقين: كيم أحمد جودة سيد و كريم محمود عبد العلق ، قد أكتم مشروع تخرجهما في سنة ٢٠٢٠ و هو بعنوان " الحد من الإضرار في صناعة الزجاج " عن طريق تقييم دخول نفايات الزجاج إلى الفرن لزيادة الإنتاجية ، حيث أننا قد سمعنا منهم بالتفصيل إلى المصنع و أخذ البيانات المطلوبة لتكليف مشروعهم على أرض الواقع إيماناً منا بواجب المساهمة في مجال التعليم و التطوير . و هذه الإفادة منا بالتفصيل

فتحتم استشارة (م.م) محمد سامح
 • توقيع المهندس المسؤول (م.م) محمد صالح (م.م) محمد صالح

WADI MCP

إفادة

السيد الأستاذ الدكتور/ عميد كلية الهندسة بجامعة أكتوبر للعلوم الحديثة والآداب - المحترم

تحية طيبة وبعد

تحيط مجموعة شركات الوادي بمتابعتكم طمناً بأن الطاقين محمد مظهر السيد و محمود محمد شعوان قد أكتم مشروع تخرجهما بصنع أغلاف الوادي بالقرنوية تحت عنوان "تحسين تصنيع أغلاف تولاين" حيث قام الطاقين بعمل دراسة في المصنع مسبوقة بتطبيق لبعض الأساليب الإحصائية لترسل في مداولات التشغيل التالي.

و قد أكتم الطاقين مشروعهما في الفترة ما بين سبتمبر ٢٠١٩ حتى أبريل ٢٠٢٠

ونشهد الشركة للطلاب المذكورين بحسن السير والسلوك وعلاوة على ذلك الالتزام والجدية في العمل وقد حازت هذه الإفادة دون أدنى مسئولية على الشركة .

إفادة

السيد الأستاذ الدكتور/ عميد كلية الهندسة بجامعة أكتوبر للعلوم الحديثة والآداب - المحترم

تحية طيبة وبعد

تحيط مجموعة شركات الوادي بمتابعتكم طمناً بأن الطاقين عبد اللطيف نصر عبد اللطيف وبشمل إيهاب محمود قد أكتم مشروع تخرجهما بصنع فوسفات الوادي بمدينة السادات تحت عنوان "تحسين التفاضل في منتج أغلاف تولاين" حيث قام الطاقين بعمل دراسة العوامل المؤثرة على المنتج النهائي في المصنع مسبوقة بتطبيق لبعض الأساليب لتحسين التفاضل وتحسين تطبيق المواصفات المثلى في منتج أغلاف تولاين (أغلاف فوسفات للكمبيوتر)

و قد أكتم الطاقين مشروعهما في الفترة ما بين سبتمبر ٢٠١٩ حتى أبريل ٢٠٢٠

ونشهد الشركة للطلاب المذكورين بحسن السير والسلوك وعلاوة على ذلك الالتزام والجدية في العمل وقد حازت هذه الإفادة دون أدنى مسئولية على الشركة .

الإدارة العامة لشؤون المواطنين
 شركة الوادي للأغلاف (ش.م.م.)

16/7/2020

Faculty of Engineering Field Trips Report

In addition to the Graduation Projects students regular visits to the industrial factories and companies , additional field trips are regularly arranged to famous industrial factories, in every semester, for other students to enrich their practical knowledge. One of these field trips was organized, for industrial and Mechatronics students, to elswedy electrometer factory and the list of students was approved by the factory and the report of implementation was prepared:



October University for Modern Sciences & Arts
Established Per the Presidential Decree No. 244,1996

السيد رئيس مجلس ادارة شركة السويدي الكترولومتر
تحية طيبة وبعد،

يرجاء التكرم بالموافقة على زيارة الطلاب الاتي اسماؤهم من قسم الهندسة الميكانيكية وقسم هندسة الميكاترونكس لمصنع الشركة بمدينة
المناس من أكتوبر، وذلك في يوم الخميس الموافق 2019/11/21.

واسئلكم بخالص الشكر والتقدير،

اسماء الطلاب والرقم القومي:

Karim mahmoud abdelhaq	29709281301398	Ahmed Sayed Abdou	29808130102014
Saad wagdy saad ibrahim	29206020100113	Ehab Tharwat Mohamed	30010011510531
Ali Mohammed Mohab Ali	29512041701099	Alaa Eldeen	29812112102136
Posy Tarek Gaber Mohamed	29106242101504	Mohamed Hussein abd el aziz mostafa	30005281701416
Menna Ali Kassem	29707242103586	Ahmed Mohamed Mohamed	29803122500033
Hossam Elaraby	29807088800079	Ahmed moustafa shaaban alshamy	29805310300133
Mohammed mahdi	201892135677	Mohamed Amgad Hussein	29804271600519
Muhannedd Amr	29808302102259	Mohamed Salama	29907122100159
Yehia Mahmoud Mohamed Ismail	29410240103411	Nada Ahmed	29912150201703
Abdelrahman Emad Ezzat	29704050103699	Omar Mokhtar ahmed	29803012713791
Mahmoud Abdellah Hamed Mohamed	29409182603117	Ahmed Ayman Ebrahim	29806142101851
Hesham adil rashid Elbhery	29407011506153	Mohammed Hesham Ismail	29807088800435
Abdulrahman Nabil	29711132102476	Mahmoud abdelmawla	29810270104178
Reem Adel Ahmed Fouad	29805102200141	Hamed Mohamed Farouk Hamed	29730222201396
Hassan Ahmed Hassan	30006270100751	Mohamed Yousry Ragab Mohamed	29802220201358
Mohamed salah mahmoud	30006288800599		

والسادة اعضاء هيئة التدريس: د/ طارق محمود الحسباني، ٢٠١٩-١١-٢١
د/ احمد فوزي، ٢٠١٩-١١-٢٠
د/ محمود سيدني، ٢٠١٩-١١-٢١



Main Admission Office : 26 July Melwar Road
Intersection with Wahat Road, 6th October City, Egypt.
Tel: (+202) 383 71518 (20lines) Fax: (+202)38371543
www.msa.edu.eg

Downtown Admission Office: 14 Amer St, El Messaha
Square, Dokki, Egypt.
Tel: (+202) 333 65037 (12 lines) Fax: (+202) 376 03811
16672 (16MSA)

Department	: Industrial systems engineering/ Mechatronics engineering	Day	: 21/11/2019
Course (Code)	: Pre-requested-No	Date	: Fall 2019
Students Registered	: 33	Students Attended	: 9
Lecturer (s)	: Sherine Bishara		
Assistant (s)	: Mahmoud Gaafar		
Organization or Site	: El Sewedy Electrometer		
Address	: 6 th October city, 2 nd industrial zone		

Field Trip Report

Covered Topics.

- 1- Introduction to El Sewedy Electrometer group, products and factories.
- 2- Visiting the production lines and going through the process with the production manager of each branch, the facility is divided into 3 main braches and a separate entity for meteorology:
 - i. Electricity meter department
 - ii. Injection molding department
 - iii. Water meter department
 - iv. Gas meter department
 - v. Common facilities that work with all departments; Ultrasonic welding , laser printing and recycling of plastic waste
 - vi. Meteorology factory for certification of the products.
- 3- Questions and feedback from students.

Field Trip Advisor : Sherine Bishara Date: 21/11/2019



Electrometer assembly



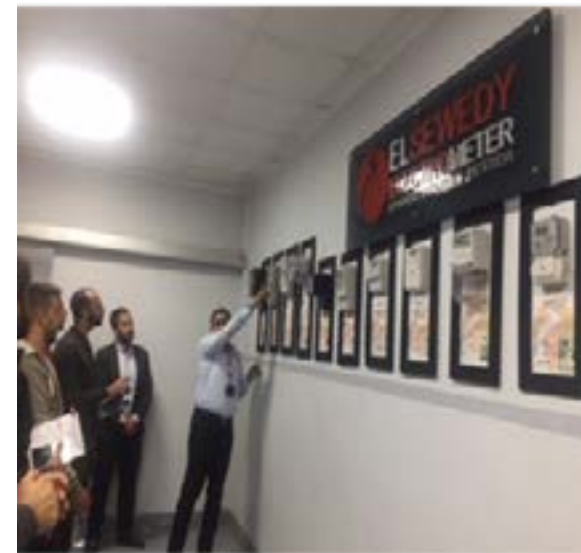
Assembly of the water meter



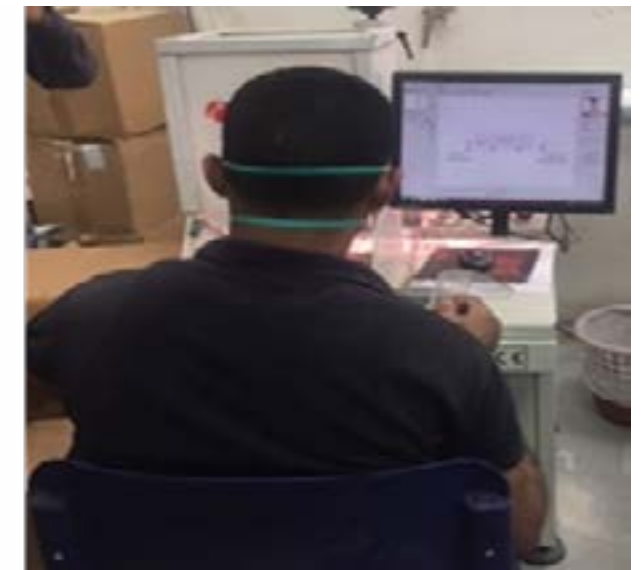
Ultrasonic Welding machine



Calibration of the gas meter



Products produced by the company



Laser printing machine

3- Teaching Activities during Covid-19 Pandemic:

The educational process during the Covid-19 crisis 2020

General:

In the Spring 2020 semester, the educational process started on 15/2/2020 in normal conditions as usual based on the planned teaching schedule set at the beginning of the semester.

After two weeks of regular education process, it was announced that there was a dangerous virus called Covid-19 attack the whole world and consequently, the Egyptian Ministry of Education and the High Council of Higher Education have declared the emergency in all educational institutes and universities.

To avoid the spread of the virus between the students and the teaching staff, hard regulations have been declared with the aim of keeping the quality of education as normal. The main regulations include the implementation of the educational process completely online through all possible electronic facilities. In the following articles, actions taken in this semester at different educational stations.

Graduation Projects presentation:

All grad projects documents, which include the final project report, plagiarism turn-it-in report, presentation power point files, project poster, factory/company, in which the project has implemented, certificates (if available) in addition to the recorded students presentation videos were uploaded on the Google drive, two weeks before local Egyptian committee presentation, and shared with the University of Greenwich and the British external examiner for moderation.

After completing the final written exams of the registered courses in the university campus, the grad students presented their grad projects, with high level of safety precautions, in front of the local Egyptian professors committee.

The grad projects were assessed and grades sent to the control unit for next process in which the grades are counted in the GPA.

:

Based on the University regulations, the graduation projects were assessed by the Egyptian committees with highly safe conditions as seen in the following photos:



MECHATRONICS DEPARTMENT

2019\2020



STAFF PROMOTIONS



Mostafa Zaki Mohamed

University Name: Leeds University, UK, 1985

Mansoura University 1997

Head of Mechatronics Systems Engineering, Faculty of Engineering, MSA University.

External Examiner

Prof. Mostafa in Brief

Examiner for The Scientific Work Submitted to the Permanent Scientific Committee for Promotion of Assistant Professors and Professors in the Field of Mechanical Engineering And Engineering Production.(Since 2008 up to now).

- Dr. Mohamed Ahmed Ramadan – Banha University – Promoted to Associate Professor (2019).
- Dr. Roubay Abdelstar - Banha University – Promoted to Associate Professor (2019).
- Dr. Mostafa Mohamed Alsayed Alhadry- Alexandria University - Promoted to Associate Professor (2019).
- Dr. Emad Aldin Farouq Alkashef - Cairo University - Promoted to Professor (2020).

Examiner for The Scientific Work Submitted to the Permanent Scientific Committee for Promotion of Assistant Professors and Professors in the Field of Applied Art. (Since 2010 up to now).

Consultant for The National Research Center of Housing, Building, Utilities and Urban Communities (Since 2011 up to now)

External Examiner to Graduate Projects of GUC (Germen University in Cairo) for Six Projects, 2019.

External Reviewer for the program of Mechanical Engineering Design – Cairo University – Faculty of Engineering (Credit Hours 2019).

Recent Publications

Prof. Mostafa in Brief (cont.)

1. Zaki, M. and Enab, T. “Study of Artificial Hip Joint Tribological Characteristics under the Effects of Magnetic Field” Journal of Biophysics and Biomedical Sciences (JBBS)” 2011.
2. S. Yousef, A. khattab, T. A. Osman, M. Zaki.”Fully Automatic System for Producing Carbon Nanotubes (CNTs) by Using Arc- Discharge Technique Multi Electrodes”. ICIES 2012.
3. Samy Yousef, A. khattab, T. A. Osman, M. Zak, "Effects of Increasing Electrodes on CNTs Yield Synthesized by Using Arc-Discharge Technique" Journal of Nanomaterials 2013 (2013); 392126.(Open Access).
4. Samy Yousef, A. khattab, M. Zak, T. A. Osman, "Wear Characterization of Carbon Nanotubes Reinforced Polymer Gears". IEEE Transactions on Nanotechnology (12) 2013; 616 – 620.
5. Alaa, Mohamed, Aly Khattab, Tarek Osman and Mostafa Zaki, "Rheological Behavior of Carbon Nanotubes as an Additive on Lithium Grease", Journal of Nanotechnology, Vol. 2013.
6. Abou Bakr Elshalakany, Bahaa M. Kamel. T.A. Osman, Esraa Afify and M. Zaki, “Improve Mechanical and Tribological Properties of A356 Reinforced by MWCNs fullerenes”, Nanotubes and Carbon Nanostructures, 2018.

Referee for Thesis

Prof. Mostafa in Brief (cont.)

1. The effect of high pressure die casting process parameter on the porosity and mechanical properties of Aluminium Silicon (ADC 12) alloy. A master degree in engineering production and mechanical design, faculty of engineering, Mansoura University, 2017.
2. Mechanical properties and photocatalytic degradation of organic dyes using (Ca-cnt/Tio2-nh2) composite nanofibers under Uv irradiation. A master degree in engineering production and mechanical design, faculty of engineering, Cairo University, 2017.
3. Design and control of a robot with multiple contactless joints using active magnetic bearing. A PhD degree in mechatronic and robotic engineering, graduate school of innovative design engineering, Egypt- Japan University (E-Just), September 2018.
4. Multi objective optimum design of a quarter car model fitted with an mr-damper. A PhD degree in mechanical engineering, faculty of engineering, Alexandria University, 2018.
5. Effect of applying lean maintenance in oil & gas fields. A master degree in mechanical engineering, faculty of engineering, Helwan University, 2019.
6. Fabrication and characterization of pan/go-zno nanofibers with enhanced mechanical properties and its application in water treatment. A PhD degree in mechanical engineering, faculty of engineering, Cairo University, 2019.

ASSOCIATE PROFESSOR



Ahmed Badawy AbdelMageed Badawy

PhD from The University of StrathClude, UK, 2007.
Associate Prof. in Military Technical College 2015.
Former Head of Eng. Mechanics Department, MTC.



Khaled Nagdy Salama Faris

PhD from Cairo University, Egypt, 2006
Associate Prof. in Electronics Research Institute (ERI) National Research Centre (NRC) 2016



Amgad Mohamed Bayoumy Aly

PhD from University of Paul Sabatier, FRANCE, 2002
Associate Prof. in Mechanical Engineering, 2020
Former Head of Aircraft Mechanical Department, 2013

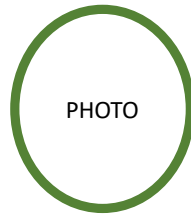
PHD HOLDER



Hussein Hamdy Shehata

PhD from Hamburg University of Technology
GERMANY, 2014
Assistant Prof. at Benha University, 2016
Assistant Prof. at MSA University, 2019
IEEE/iROS member, CLAWAR member

MASTER'S HOLDER



Wael Sami Taie
Ain Shams University 2015



Ahmed Moustafa Ahmed Hussein
Minia University 2018

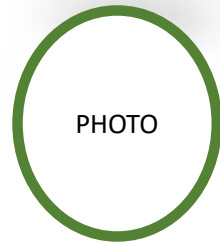


Mohamed Hazem
Cairo University 2020

TEACHING ASSISTANT



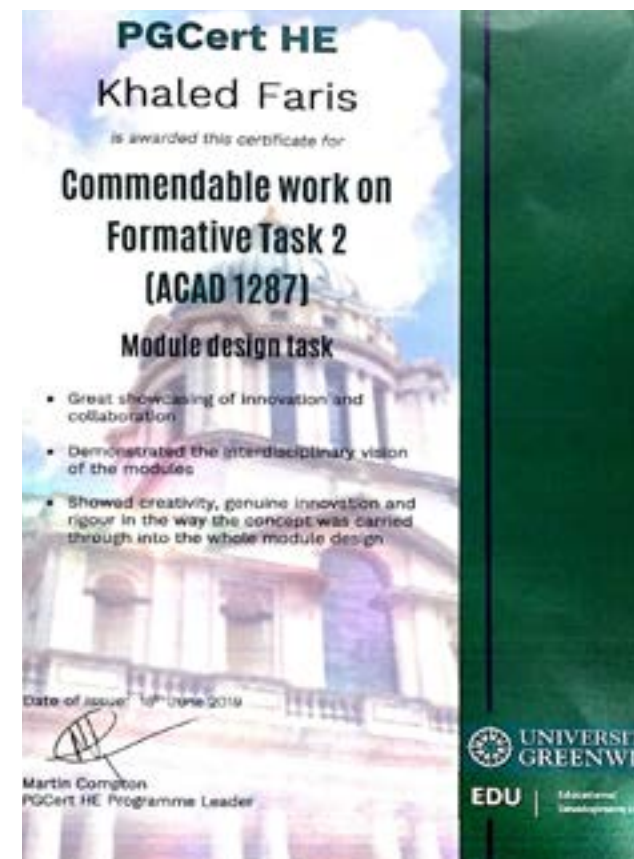
Ahmed Gamal



Abd Allah Ahmed Abd EL-Moez



Mohamed EL- Fayoumy



UOG PG CERTIFICATE IN HE



Khaled Nagdy Salama Faris, Associate Professor

*Khaled Faris
Associate Professor*

Fellowship Certificate of the Academy of Higher Education in United Kingdom (UK)

A commendation certificate for PG Cert. Task2

FIELD TRIPS

Beaty Factory 2019



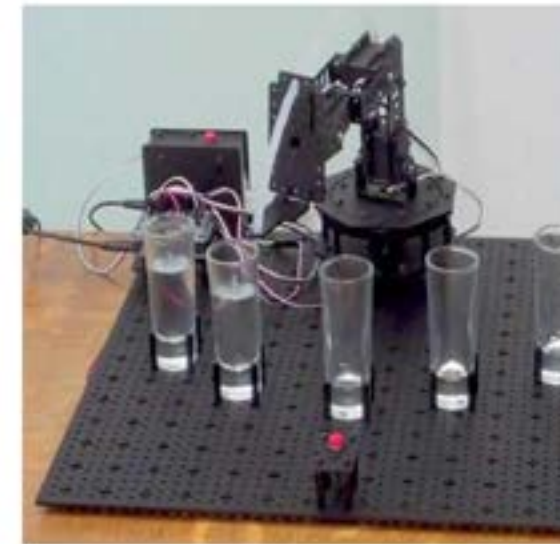
Power Plant of New administrative Capital 2019



STUDENTS PROJECTS

Students' Projects

Robofiller Robotic Arm



Robofiller Arm

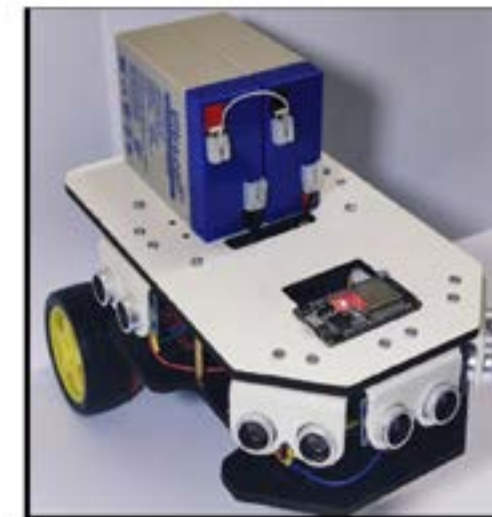
Students' Projects

Fruit sorting using robotic arm



Students' Projects

Differential Drive Mapping Robot



Students' Projects

Face Recognition Smart Lock



Students' Projects

3-Axis Hybrid Stepper Based Robotic Arm



Students' Projects

Chess Playing Robot



Students' Projects

Collection of Some Projects



LAB FACILITIES

New Mechatronics' Labs

Sensors' Lab



Mechatronics' Labs

Electric Drive Systems' Lab



STUDENTS HONORING

Honoring Distinguished Students
Academic Year 2019/2020



Honoring Distinguished Students
Academic Year 2019/2020



STUDENTS CERTIFICATES



RESEARCHES - 2020

1. A. R. Hamed, A. A. Omer, M. Ashry and A. Badawy, "Optimized Curvilinear Potential Field Based Multi-objective Satellite Collision Avoidance Maneuver," 2020 IEEE Aerospace Conference, Big Sky, MT, USA, 2020, pp. 1-9, doi: 10.1109/AERO47225.2020.9172718.
2. A. Abdelghany, M Hegazy and A Badawy, "Passive Vibration Attenuation: A Comparison Study", AMME 2020, MTC, Cairo, Egypt, Paper No. 1103.
3. Elsherbiny, A.M., Bayoumy, A.M., Elshabka, A.M., Abdelrahman, M.M. (2020) Unrestricted general solution of 6DoF inverse dynamics problem of a 3D guided glider. *Mathematical Modelling of Engineering Problems*, Vol. 7, No. 3, pp. 465-475. <https://doi.org/10.18280/mmep.070318>

RESEARCHES - 2019

1. A Badawy, Multiple Debris Orbital Collision Avoidance, IEEE AeroSpace Conference, Big Sky, Montana, Mar 2nd 2019.
2. Abdelrahman Youssef, Amgad M Bayoumy Aly, Mostfa rostom, Farid A.Tolba: Modeling and Simulation of 3DOF Parallel Manipulator Using Artificial Neural Network. 18th International Conference on Aerospace Sciences & Aviation Technology, Cairo, Egypt, 04/2019
3. A. Badawy, Optimized Curvilinear Potential Field Function for Satellite Collision Avoidance, accepted for AIAA Propulsion and Energy Forum and Exposition, Indianapolis, Indiana, 19-21 August 2019.
4. A. Badawy, Industrial Upper Limb Exoskeleton, accepted for Fourth International Undergraduate Research Conference (2019).
5. A. Badawy, Passive Hip Joint Assist Exoskeleton, accepted for Fourth International Undergraduate Research Conference (2019).
6. A. Badawy, Myoelectric prosthetic hand with a proprioceptive feedback system, *Journal of King Saud University – Engineering Sciences*, <https://doi.org/10.1016/j.jksues.2019.05.002>.
7. Modelling and simulation of 3DOF parallel manipulator using artificial neural network, Abdelrahman Youssef, Amgad M Bayoumy, Mostafa Rostom and Farid A Tolbah, 2019, IOP Conf. Ser.: Mater. Sci. Eng. 610 012080 <https://doi.org/10.1088/1757-899X/610/1/012080>

RESEARCHES - 2018

1. Abd El Hady, M., Youssef, A.M., Bayoumy, A.M., Elhalwagy, Y. Z., Fixed Ground-Target Tracking Control Of Satellites Using A Nonlinear Model Predictive Control, *J. Mathematical Modelling of Engineering Problems*, 03/2018, 5 (1), 11-20
2. Hassan Shahat, Amgad M. Bayoumy Aly, Gamal Elbayoumi, Mohamed Abdelrahman: Modeling and Inverse Simulation of Generic Helicopter Maneuvers. 2018 AIAA Modeling and Simulation Technologies Conference; 01/2018, DOI:10.2514/6.2018-1169
3. Fayed, E.M., Elmesalamy, A.S., Sobih, M. and Elshaer, Y., 2018. Characterization of direct selective laser sintering of alumina. *The International Journal of Advanced Manufacturing Technology*, 94(5-8), pp.2333-2341. 2018
4. Elsherbiny, A.M., Aly, A.M., Elshabka, A. and Abdelrahman, M., 2018. Inverse Simulation of Symmetric Flight of a Guided Gliding Subsonic Flying Body. In 2018 AIAA Modeling and Simulation Technologies Conference (p. 0427).
5. Elsherbiny, A.M., Aly, A.M., Elshabka, A. and Abdelrahman, M., 2018. Modeling, Simulation and Hybrid Optimization Method as Design Tools for Range Extension Kit of a Subsonic Flying Body. In 2018 AIAA Modeling and Simulation Technologies Conference (p. 0429).

RESEARCHES - 2017

1. Fayed, E.M., Elmesalamy, A.S., Sobih, M. and Elshaer, Y., Influence of Laser Process Parameters on Properties of Alumina Parts Produced By SLS.
2. A M Elsherbiny, A M Bayoumy, A M Elshabka, M M Abdelrahman: Aerodynamic Design Optimization of Range Extension Kit of a Subsonic Flying Body. *AEROSPACE SCIENCES & AVIATION TECHNOLOGY, ASAT - 17; 04/2017*
3. Desoky, A. M. Bayoumy and G. Hassaan: Modeling and Simulation of a Vision-Based Autonomous Vehicle. *AEROSPACE SCIENCES & AVIATION TECHNOLOGY, ASAT - 17; 04/2017*
4. Desoky, A. M. Bayoumy and G. Hassaan: Implementation of Vision-Based Trajectory Control for Autonomous Vehicles. *AEROSPACE SCIENCES & AVIATION TECHNOLOGY, ASAT - 17; 04/2017*
5. Hassan Shahat Hassan, Amgad M. Bayoumy, Gamal M. El-Bayoumi and Mohamed Madbouly Abdelrahman: Modeling, Trimming and Simulation of a Full Scale Helicopter. *AEROSPACE SCIENCES & AVIATION TECHNOLOGY, ASAT - 17; 04/2017*
6. Hassan Shahat Hassan, Amgad M. Bayoumy, Gamal M. El-Bayoumi and Mohamed Madbouly Abdelrahman: Inverse Simulation of a Full-Scale Helicopter Using Finite Difference Technique. *AEROSPACE SCIENCES & AVIATION TECHNOLOGY, ASAT - 17; 04/2017*
7. Hady Bel, Amgad M. B. Aly, Ahmed M. Youssef, Yehia Z. Elhalwagy: Non-linear Control Law Design For Satellite Fixed Ground Target tracking. *AIAA Guidance, Navigation, and Control Conference; 01/2017, DOI:10.2514/6.2017-1036.*
8. A. Refaat, A. Badawy, M.M. Ashrey, and A. A. Omar, "High Accuracy Spacecraft Orbit Propagator Validation", paper DV-5, AMME 18.
9. S. Sayed, S. Wagdy, A. Badawy and M.Hegazy, Modeling and Analysis of a Single Mass Resonant Gyroscope ", AMME 18.
10. A commendation certificate for PG Cert. Task2
- S. Sayed, A. Badawy, S. Wagdy and M.Hegazy "Experimental Sensitivity Analysis of Decoupled Resonant Gyroscope", International Conference on Industrial Engineering, Moscow, Russian Federation, 2018.

COMPUTER SCIENCE ENGINEERING DEPARTMENT

2019\2020



CSE DEPARTMENT OBJECTIVES



Samer Ibrahim

Head of Computer Systems
Engineering department

The main aims and objectives of these efforts from CSE department are as follow:

1. Improve professional skill set and calibers for both undergraduate's students and make them ready for market hiring.
 2. Create plug and play pool of talents fit for business needs and customized with corporate footprint.
 3. Improve collaboration and partnership with the industry.
 4. Develop calibers with creative mindsets who are passion to innovate.
 5. Make innovation part of everyone day2day activities.
 6. Build MSA CoE (Centre of Excellence) that interfaces and manages interlock with the industry.
 7. Enable our students to create strong networks, achieve critical experiences, and develop core skills that position them for career success.
 8. Help graduates to learn about multi-national organization and IT industry and diverse product lines and participate in peer job shadows
 9. Support graduates to gain a cross-functional understanding of how our business functions work.
 10. Enable graduates to succeed in their careers at multi-national organizations
 11. Build strong partnership with industry and gain trust to promote this level in the future
 12. Setup academic Alliance or MOU (Memorandum of Understanding) to interface with industry
 13. Gain new talents and soft skills of how to communicate and present projects in professional approach like in IT industry to international clients
 14. Promote the partnership between industry and MSA to increase number of sponsored projects
- Multinational organizations who are equipped with the technology, skills and competencies that fit for market needs.
16. Start to have new type of activities sponsored by industry like Electives courses offered by industry experts from industry to MSA students
 17. Support field trips to MSA engineering students to industry labs and headquarter in Smart Village, Egypt.

Research+ Publications



Samer Ibrahim

Head of Computer Systems
Engineering department

- 1- Mohamed, S. I. (2015), "Comprehensive Measurement Analysis for Software Productivity", International Journal of software engineering (IJSE), Vol 8, Issue 2, pp. 3-22.
- 2- Mohamed, S. I. (2015), "Software development productivity impact from an industrial perspective", International Journal of Scientific and Engineering Research (IJSER), Vol 6, Issue 2, pp. 1333-1342 - 10.14299/ijser.2015.02.007
- 3- Mohamed, S. I. (2015), "DevOps shifting software engineering strategy Value based perspective", International journal of computer engineering (IOSR-JCE), Vol 17, Issue 2, pp 51-57.
- 4- Mohamed, S. I. (2016), "Goal oriented DevOps transformation framework–Metric phased approach", International Journal of Current Research (IJCR), Vol. 8, Issue 3, pp. 28307-28313.
- 5- Mohamed, S. I. (2016), "DevOps Maturity Calculator DOMC - Value oriented approach", International Journal of Engineering Research & Science (IJOER), Vol 2, Issue 2, pp 25- 35.
- 6- Mohamed, S. I. (2016), "New Style of software life cycle strategies – use case perspective", International Journal of Management, Information Technology and Engineering (IJMITE), Vol. 4, Issue 3, 99-114.
- 7- Mohamed, S. I. (2016), "Innovative software delivery framework towards software applications modernization", International Journal of Research in Engineering & Technology (IJRET), Vol 4, Issue 5, PP 77-98
- 8- Mohamed, S. I. (2016), "Software Release management evolution – Comparative analysis across agile and DevOps continuous delivery", International journal of Advanced Engineering Research and Science (IJAERS), Vol 3, issue 6, pp 52-59

Research+ Publications



Samer Ibrahim

Head of Computer Systems
Engineering department

- 9- Mohamed, S. I. (2016), "Towards true adaptive and smart Agent Based Traffic Signal Control", International Journal of Exploring emerging trends in Engineering (IJETTE), Vol 3, issue 3, pp 199-208
- 10- Mohamed, S. I., Amr AbdelNabi, (2017), "AGENT-BASED CONVOLUTION AND REINFORCEMENT LEARNING", International Journal of Management, Information Technology and Engineering (IJMITE), Vol 5, issue 12, pp 17-28
- 11- Mohamed, S. I., Youssef Youssef, (2018), "Enhanced Model-Free deep Q-Learning Based control", International Journal of Computer Engineering (IOSR), Vol 20, issue 1, pp 23-32
- 12- Mohamed, S. I., (2018), "Decentralized traffic management system via reinforcement learning ", International Journal of Scientific & Engineering Research (IJSER), Vol 9, issue 11, pp 1441-1449
- 13- Mohamed, S. I., (2019), "Intelligent urban transport tracking and management system ", International Journal of Scientific & Technology Research (IJSTR), Vol 8, issue 12, pp 850-862
- 14- Mohamed, S. I., (2020), "Reference Evapotranspiration prediction for SMART irrigation ", International Journal of Engineering and Advanced Technology (IJEAT), Vol 10, issue 1, pp 540-547
- 15- Mohamed, S. I., (2020), "Potato leaf disease diagnosis and detection system based on convolution neural networks ", International Journal of Recent Technology & Engineering (IJRTE), Vol 9, issue 4, pp 144-150
- 16- Mohamed, S. I., (2021), "IoT bus navigation system with optimized routing using machine learning ", International Journal of Information Technology and Computer Science (IJITCS), Vol 13, issue 1, pp 44-51
- 17- Mohamed, S. I., (2021), "Smart proactive warning system for early prediction of potato late blight via machine learning ", International Journal of Innovative Technology and Exploring Engineering (IJITEE), Vol 10, issue 4, pp 60-70



Ahmed Ayoub

Assistant Professor

1. Y. Hamid, A. Ayoub, M. Alhawit, "Agent-Based Intelligent Academic Advisor System," International Journal of Advanced Computer Technology (IJACT), vol. 4, issue 2, pp. 1-6, 2015.
2. A. Ayoub, "Framework Design of an Integrated Multiagent Expert System for Saudi Employment," International Journal of Advanced Computer Technology (IJACT) vol. 4, issue 2, pp. 59-65, 2015.
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Ahmed Ayoub

Assistant Professor

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Students Publications

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2- Mohamed, S. I., Youssef Youssef, (2018), "Enhanced Model-Free deep Q-Learning Based control", International Journal of Computer Engineering (IOSR), Vol 20, issue 1, pp 23-32

Awards+Prizes

Autonomous Operation and Motion Humanoid Robot

Award: Best graduation project award from Engineering syndicate



Samer Ibrahim
Head of department

Abstract

Most of private enterprises and governmental institutions have in an increasing need for enterprise-oriented digital rights management (E-DRM) schemes. E-DRM schemes provide protection to digital contents that contain corporates' sensitive information and prevent unauthorized access to these data. Previous work proposed a storage reliable and efficient E-DRM systems based on the information dispersal algorithm. In this paper, we proposed a computationally enhanced information dispersal and reconstruction algorithms. We achieved significant reduction in the computational complexity without affecting the E-DRM system security and with comparable storage requirements.



Engineering syndicate 1st award

Graduation projects

3D Gesture User interface Testing Environment

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair
Eng. Mirna Azmy - Eng. Mina Magdy



Objective

Development of a new testing environment that could validate Valeo's "3D Gesture User Interface" functionalities without human interaction using a designated general-purpose automatic test bench from National Instruments, combined with a mechanical hand and a driving Embedded Software that could simulate different gestures needed by the device to confirm the correct gesture recognition product.

This project is the first sponsored project by Multi-national organization Valeo from MSA university to develop this Proof Of Concept (PoC). The project got successfully deployed in 2020 through one of Valeo OEM (manufacturers). This project was fully supervised by Assoc. Prof Samer Ibrahim with two teams from both MSA and Valeo together to design, develop and test the project in real environment.



3D printing

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair
Eng. Islam Samir - Eng. Mina Magdy

Objectives:

- Greater self-replicating ability than other designs. Electronics board replicating ability.

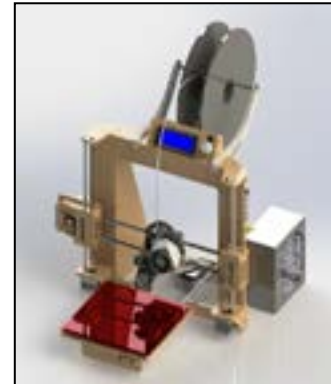
Advantages:

- Cheap to build.

- A goal of at least 100 micron (0.1 mm) of printing resolution.

Ease of use.

- One board electronics design for easier replication.



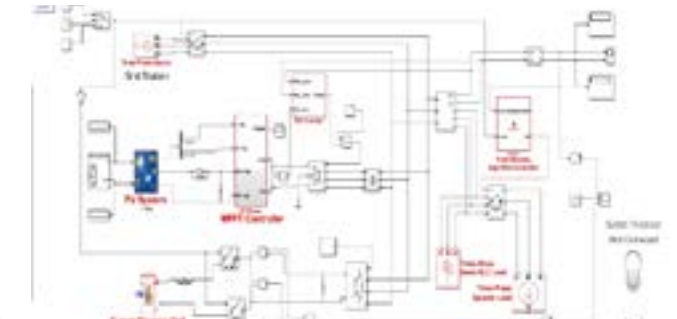
SMART Energy metering

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair
Eng. Karim Alaa – Eng. Amro Mahmoud

Objectives:

- Offering new techniques of monitoring our energy consumption.
- We can reach the targeted supply-demand balance
- Relying even more on renewable, self-sustained energy
- Having controllability to better handle emergencies and maintenance



SMART Logistics System:Blockchain-Powered Supply Chain Management

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair
Eng. Muhammed Hisham

Objectives:

- Investigating the use of blockchain technology in logistics systems.
- Creating immutable solution to supply chain transactions.
- Creating a fully modular, robust system that easily integrates business needs.



SMART CAP for disabled people

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair
Eng. Karim Alaa – Eng. Amro Mahmoud

Objective:

Quadriplegic patients that suffer from limb paralysis face everyday difficulties due to their inabilities. Some of these difficulties are their ability to interact with people through social media applications and controlling electronic devices present at 90 % of the households nowadays such as mobiles, laptops, smart TV s, microwaves and even door intercomes.



INTELLIGENT URBAN TRANSPORT TRACKING AND MANAGEMENT SYSTEM

introduced by:
Dr. Samer Ibrahim – Project supervisor Chair
Eng. Beshoy Maher



Objective

Egypt's current bus system is large enough to satisfy a significant portion of the population's demand yet fails to do so due to mismanaged resources. Static lines and unclear schedules create a confusing and unappealing user experience which pushes more of the population to cars for their transportation needs. This clearly leads to more congested streets which result in a net loss of productivity as well as an increase in stress, unnecessary fuel consumption, and harmful emissions. An intelligent bus solution is multi-faceted. It consists of (1) connected buses which are capable of providing their geo-location data, feedback about driving behavior, and health data to detect failures before they occur; (2) cashless payment through RFID cards to ensure much tighter control over pricing; (3) a processing server or cloud, in which all of the incoming data would be handled; (4) knowledge systems which dynamically optimize bus schedules and routes through learning algorithms; (5) and a mobile application to capture demand and inform passengers of bus arrival times. The main functions and algorithms of the proposed system are achieved based on machine learning algorithms and web technologies, whilst the hardware component is implemented based on System-on-Chip technology with custom hardware to interface with the vehicle. This paper will focus on the software component of the proposed solution. It is shown that by applying the proposed system to a previously static bus system that fuel consumption, maintenance costs, and carbon emissions can be reduced by 10-20% while overall passenger satisfaction is increased.

Potato Leaf Disease Diagnosis and Detection System Based on Convolution Neural Network

introduced by:
Dr. Samer Ibrahim – Project supervisor Chair
Eng. Khaled Abdallah

Objective

For decades, agriculture has been an essential food source. According to related statistics, over 60% of the total earth population mainly depend on agriculture's sources for their primary feed. Unfortunately, one of the disaster problems that affect badly on agriculture production is plant diseases. There are about 25% of agriculture production lost annually because of plant diseases. Late and Early Blight diseases are one of the most destructive diseases that infect potato crop. Although, the late and inaccurate detection of plant diseases increases the losing percentage for the crop. The main approach of our proposed system is to detect early the plant diseases to decrease the plant's production losses by using a diagnosis and detection system based on the Convolution Neural Network (CNN). We used CNN to extract the diseases features from the input images of the supported training dataset for classification purposes. For model training, 1700 of potato leaf images were used, then the testing process is done by using approximately 300 images and 100 images for fine tuning and parameters calibration against any biased data. Our proposed CNN architecture archives 98.2% accuracy, which is higher compared with other approaches run on the same dataset algorithms and web technologies, whilst the hardware component is implemented based on System-on-Chip technology with custom hardware to interface with the vehicle. This paper will focus on the software component of the proposed solution. It is shown that by applying the proposed system to a previously static bus system that fuel consumption, maintenance costs, and carbon emissions can be reduced by 10-20% while overall passenger satisfaction is increased.

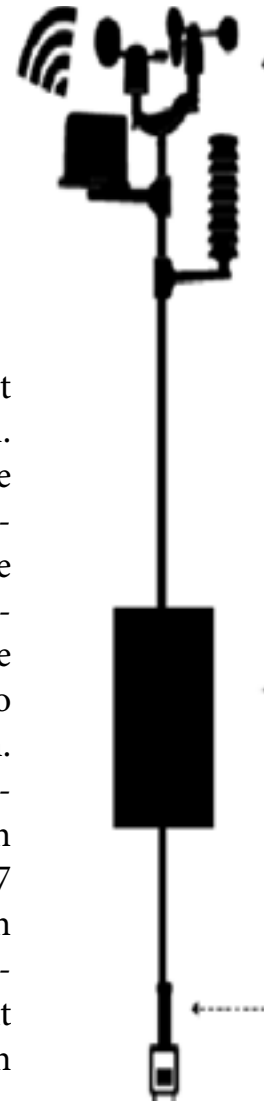


Reference Evapotranspiration Prediction for Smart Irrigation

introduced by:
Dr. Samer Ibrahim – Project supervisor Chair
Eng. Khaled Abdallah

Objective

Irrigation is the most critical process for agriculture, but it is also the largest consumer of fresh water because of the inaccuracy in crop water estimation. Our proposed system aims to improve irrigation management by estimating the amount of water needed by the crop accurately and reduces the number of meteorological parameters needed for such estimation. Detection of the reference crop evapotranspiration (ET₀) is the most critical process in crop water estimation, that is considered through our proposed solution by implementing machine learning models using neural networks and linear regression to predict daily ET₀ using climate data like temperature, humidity, wind speed, and solar radiation. Comparing our system results with FAO-56 Penman-Monteith ET₀ and cropwat8.0 software as benchmark, show that our proposed system is better than the linear regression model, in terms of determination coefficient (R^2)=.9677 and root mean square error(RMSE) =.1809, while the multiple linear regression model achieved determination coefficient (R^2)=.68 and root mean square error(RMSE) =3.01. Our system then used the predicted ET₀ and Crop coefficient (K_c) from FAO, to estimate crop evapotranspiration (ET_c) for precision irrigation target.



SMART Autonomous and Connected Vehicle

introduced by:
Dr. Samer Ibrahim – Project supervisor Chair
Eng. Mohamed Samir

Objective

Commuting is an exhausting activity. Not only does it consume time and energy, but it also, due to the long time it takes, makes distraction an easy and inevitable action. Moving your eyes from the road may cause accidents that have a large negative impact on the driver, his/her car and the surroundings. To tackle these problems, multiple car manufacturer introduced a variety of technologies that assist the driver, these technologies include CCS, CWS and multiple other techniques that ensures the driver safety. Research papers has presented the idea of autonomous vehicle, each proposing a different take on how a car precept the environment around it using a range of sensors and act upon these data. Our project reviews these different techniques proposed by multiple already established papers, go through the different technologies' car manufacturers use in their cars to detect obstacles and actions taken to avoid them and proposed innovative approach to overcome these obstacles.



Smart IOT irrigation for customized soil

introduced by:

Dr. Samer Ibrahim – Project supervisor Chair

Eng. Khaled Ehab

Objective

Irrigation uses about 70% of available freshwater resources, large amount of water that uses in irrigation is wasted because the weakness in efficiency water management. In this project smart IOT irrigation system is aimed to optimize the efficiency of water management. the system predicts the weekly irrigation schedule that needed to plant through the soil measurements like soil moisture and climatic variables like temperature and humidity, all of these measurements collect from the sensors that deployed in the field. These measurements will use to predict weekly irrigation schedule through machine learning techniques and use this schedule to make the control in the irrigation water is automatic based on microcontroller that connected to actuator. Our system is validated on wheat. Performance is tested through compare between system results and agronomists' recommendations.

Students Activities

1. CanSat Training Program (CTP)

The goal is to initiate an MSA CanSat training program for students and promote them towards national and international competitions, under the supervision of CSE club within Engineering and CS faculty and under the supervision of Dr. Samer Ibrahim Mohamed, head of computer systems engineering. Our goal is to start the program Fall 2016. The trainings were targeted at enriching both technical and soft skills like detailed in the objective section. The target is to sync with MSAMUN, in order to share logistic resources (rooms, buses). Academic plan/calendar will be shared in separate document for the whole program.

Candidate's selection criteria

- 1- CSE students
- 2- Basic programming skills



2. Career Advice



A career advice is a venue in which students and employers can exchange ideas and information about employment opportunities. Some employers actively recruit summer internships at career advice event, while others participate in order to learn what skills and perspectives geography students can offer their organizations, to stay connected with and "give back" to the departments and institutions from which they graduated, and to demonstrate their interest in hiring geography graduates. Participating students can explore a range of career paths, network with prospective employers, and practice essential professional skills.



3. Field Trips



Valeo field trip



4. Funded projects



Academy of Scientific Research and Technology (ASRT)

Radiosonde is a balloon-borne device that is used worldwide to measure several vertical meteorological parameters like temperature, humidity, air pressure, wind speed, and wind direction at various layers of the atmospheres. It then transmits these parameters to ground station for further processing related to weather forecasting that serves aviation, marines, military, agriculture as well as many other applications. This device is one time use since it is carried by the balloon that explodes at high altitude (20 Km high). Egyptian Meteorological Authority (EMA) is one of the main users and consumers of radiosonde devices. EMA has 6 ground stations distributed across Egypt. Each station launches 2 devices daily with around 5 thousand devices per year. To have more precise forecasting profiles the number of stations in Egypt and number of launches need to be doubled. This could cost EMA more than 2 million US dollars or 40 million Egyptian p. per year and puts a lot of pressures on the budget allocated for EMA which in turn raises massive need to design and innovate a new device or system. The proposed system as part of this research aims to overcome the current imported system drawbacks and weaknesses, improve performance and features, along with the economic and social benefits from the designing and implementing this device to serve and satisfy our national and regional needs.

This project was integrated project of different other sub systems and got funded by Academy of Scientific Research and Technology (ASRT) to be deployed across Egypt to replace the current imported other products.

5. PCB training session

PCB workshop: Printed Circuit board workshop was made under supervision of STC. Aim is to enhance and develop a new skill to electronics students as follow: " Schematic Design, PCB Deign and Fabrication, soldering electronic components, and programming micro controller". All these skills were used to achieve the target of placing the PCB design to a copper plate. The workshop was held in 4 days, and the student were able to design and fabricate Printed circuit board.



PCB Training

7. CSE Club



PG Certificate

UoG PG Certificate in HE



Samer Ibrahim Mohamed

CSE department head

Alumni

Autonomous Operation and Motion Humanoid

The project has the aim to build the neural network that will serve as the concrete in making the lower body of the robot able to learn how to balance while walking. This neural network will be integrated with Q-learning algorithm that part 1 will construct to complete the lower body learning algorithm which is Deep Q-Networks (DQN). Also, this part (part 2) has the target to build the upper body learning algorithm using Convolution Neural Network (CNN) that will take inputs from the camera to detect the goals in order to move towards them from one place to another. The proposed system is different from the applied ones in many aspects like a) the under-actuation concept that results in lower cost and power consumption. b) Using Deep Q-Learning algorithm which has not been used in humanoid robots except for one approach named Atlas which was model based while our system is model free.



Autonomous Operation and Motion Humanoid Robot

Computer Systems Engineering (CSE) footprint in Social/Community Development

1- Partnership With industry

One of the main aims for Computer Systems Engineering (CSE) department within Faculty of Engineering is to promote the partnership level with the industry. To reflect this aim we have many graduation projects and proof of concepts deployed in the industry/community as detailed in the below sections:

1.1. RadioSonde weather data analysis and forecasting subsystem (EMA)

Radiosonde is a balloon-borne device that is used worldwide to measure several vertical meteorological parameters like temperature, humidity, air pressure, wind speed, and wind direction at various layers of the atmospheres. It then transmits these parameters to ground station for further processing related to weather forecasting that serves aviation, marines, military, agriculture as well as many other applications. This device is one time use since it is carried by the balloon that explodes at high altitude (20 Km high). Egyptian Meteorological Authority (EMA) is one of the main users and consumers of radiosonde devices. EMA has 6 ground stations distributed across Egypt. Each station launches 2 devices daily with around 5 thousand devices per year. To have more precise forecasting profiles the number of stations in Egypt and number of launches need to be doubled. This could cost EMA more than 2 million American dollars or 40 million Egyptian pounds per year and puts a lot of pressures on the budget allocated for EMA which in turn raises massive need to design and innovate a new device or system. The proposed system as part of this research aims to overcome the current imported system drawbacks and weaknesses, improve performance and features, along with the economic and social benefits from the designing and implementing this device to serve and satisfy our national and regional needs.

This project was integrated project of different other sub systems and got funded by Academy of Scientific Research and Technology (ASRT) to be deployed across Egypt to replace the current imported other products.

1.2. 3D gesture control via robotic arm (Valeo)

With the advancement in technology, the vehicle has become a place for media consumption, a communications center and an interconnected workplace. The number of features in a vehicle has also increased. And With the growing demand for luxurious, safe, and smart vehicles, automotive manufacturers are increasingly developing automobiles with integrated infotainment systems – systems combining both of entertainment and information for an enhanced in-vehicle experience. Infotainment in automotive industry is getting more in the direction of using the senses of human beings to control all features of the technology. All the infotainment systems applied in the automotive industry is being tested manually and physically by the testers. This consumes much time, money and effort to test every new infotainment system manually. Thus, building this automated testing environment is a new innovative approach to test the functionalities of any user gestures interface as it has been assured that this system covers all gestures done by human's hand. So, this automated testing environment facilitates and saves time and money rather than manual testing which used to be done. Therefore, we have done this project aiming to automate the testing of Valeo's 3D Gesture User Interface and to prevent human error which will result in a very high quality and high accuracy for the product.

This project is the first sponsored project by Multi-national organization Valeo from MSA university to develop this Proof Of Concept (PoC). The project got successfully deployed in 2020 through one of Valeo OEM (manufacturers). This project was fully supervised by A. Prof Samer Ibrahim with two teams from both MSA and Valeo together to design, develop and test the project in real environment.

The trust gained from this successful deployment of the project in Valeo, helped us to:

- 1- Promote the partnership between Valeo and MSA to increase number of sponsored projects from 1 to 7 projects in 2021
- 2- Increase the Hiring rate of MSA graduates in Valeo who are equipped with the technology, skills and competencies that fit for Valeo needs.
- 3- Start to have new type of activities sponsored by Valeo like Electives courses offered by industry experts from Valeo to MSA students
- 4- Support field trips to MSA engineering students to Valeo labs and headquarter in Smart Village, Egypt.

2- Internships and Bootcamps with the industry (HP)

Computer Systems Engineering (CSE department), thanks to the efforts performed by Assoc. Prof Samer Ibrahim succeeded to promote the partnership with the industry and to make agreement with multi-national organization such as, HP to organize and sponsor full internship of 2 months for MSA engineering students in the current hot technologies from HP campus in Smart village Egypt. This internship was one of the unique opportunities offered to MSA engineering students to:

- 1- Interlock with the industry and work in multi-national environments like HP with highly skilled engineers.
- 2- Gain new talents and soft skills of how to communicate and present projects in professional approach like in IT industry to international clients.
- 3- Learn new hot and complex technologies like Artificial Intelligence (AI), Cloud computing architecture, Big data analytics, Web development (full stack)

The main aims and objectives of these efforts from CSE department are as follow:

- Improve professional skill set and calibers for both undergraduate's students and make them ready for market hiring.
- Create plug and play pool of talents fit for business needs and customized with corporate footprint.
- Improve collaboration and partnership with the industry.
- Develop calibers with creative mindsets who are passion to innovate.
- Make innovation part of everyone day2day activities.
- Build MSA CoE (Centre of Excellence) that interfaces and manages interlock with the industry.
- Enable our students to create strong networks, achieve critical experiences, and develop core skills that position them for career success.
- Help graduates to learn about HP strategy and diverse product lines and participate in peer job shadows.
- Support graduates to gain a cross-functional understanding of how our business functions work.
- Enable graduates to succeed in their careers at HP.
- Build strong partnership with industry and gain trust to promote this level in the future.
- Setup academic Alliance or MOU (Memorandum of Understanding) to interface with industry.

3- Distinguished projects that serve community problems and needs

1- Smart IOT irrigation for customized soil

Irrigation uses about 70% of available freshwater resources, large amount of water that uses in irrigation is wasted because the weakness in efficiency water management. In this project smart IOT irrigation system is aimed to optimize the efficiency of water management. the system predicts the weekly irrigation schedule that needed to plant through the soil measurements like soil moisture and climatic variables like temperature and humidity, all of these measurements collect from the sensors that deployed in the field. These measurements will use to predict weekly irrigation schedule through machine learning techniques and use this schedule to make the control in the irrigation water is automatic based on microcontroller that connected to actuator. Our system is validated on wheat. Performance is tested through compare between system results and agronomists' recommendations.

2- Intelligent Urban Transport Tracking & Management System

Egypt's current bus system is large enough to satisfy a significant portion of the population's demand yet fails to do so due to mismanaged resources. Static lines and unclear schedules create a confusing and unappealing user experience which pushes more of the population to cars for their transportation needs. This clearly leads to more congested streets which result in a net loss of productivity as well as an increase in stress, unnecessary fuel consumption, and harmful emissions. An intelligent bus solution is multi-faceted. It consists of

(1) connected buses which are capable of providing their geo-location data, feedback about driving behavior, and health data to detect failures before they occur; (2) cash-less payment through RFID cards to ensure much tighter control over pricing; (3) a processing server or cloud, in which all of the incoming data would be handled; (4) knowledge systems which dynamically optimize bus schedules and routes through learning algorithms. A mobile application to capture demand and inform passengers of bus arrival times.

The main functions and algorithms of the proposed system are achieved based on machine learning algorithms and web technologies, whilst the hardware component is implemented based on System-on-Chip technology with custom hardware to interface with the vehicle. It is shown that by applying the proposed system to a previously static bus system that fuel consumption, maintenance costs, and carbon emissions can be reduced by 10-20% while overall passenger satisfaction can be increased.

3- Smart IoT Plant Diseases Detection System

The Internet of Things (IoT) technology is presently shaping completely different aspects of human life. Precision agriculture is one of the applications which may use the IoT technology to optimize the production efficiency, optimize the standard of the crops, and minimize the negative environmental impact like plant diseases. Plant diseases are generally one of the most important problems that threaten the world's agricultural, causing large losses in agricultural production of about 25% per year. The proposed system is consisting of two main features proactive and reactive; the proactive part is based on the data collected from the sensors at plant environment, forecasting weather data from weather stations, and historical data. The reactive action is based on the image processing technique which to monitoring the field if there are any early symptoms appears on the leaf of the wheat to help the system to be more accurate and the right reactive act.

4- Smart Traffic Management System via Connected Vehicles

Traffic jams are a major problem all-over the world because of accidents and congestions in the rush hours throughout the day, and the waste of money and time is really priceless, also the pollution caused by traffic congestions is destroying the environment. Following-up the vision of the smart city there is a need to an adaptive, fully-autonomous traffic management system to tackle the traffic and manage it accordingly to achieve the real-time decision, minimize the trip time as possible, and save lives by prioritizing the vehicles to emergency and normal vehicles, and reduce the pollution of the vehicles and its harm to the environment, and cost less compared to the other systems, and these are the main objectives that our proposed system is going to tackle, and the main features compared by other systems and projects. This is going to be accomplished by using Dedicated Short-Range Communication protocol (DSRC) between the vehicle and the traffic light and vice versa, and the intelligent traffic light will take decision in real time and adapt the situation and re-route by using Machine Learning algorithms. By applying the proposed system, the wasted time and money in fuels can be reduced, and also lives are going to be saved.

5- SMART Autonomous and Connected Vehicle

Commuting is an exhausting activity. Not only does it consume time and energy, it also, due to the long time it takes, makes distraction an easy and inevitable action. Moving your eyes from the road may cause accidents that have a large negative impact on the driver, his/her car and the surroundings. To tackle these problems, multiple car manufacturers introduced a variety of technologies that assist the driver, these technologies include CCS, CWS and multiple other techniques that ensure the driver safety. Research papers have presented the idea of autonomous vehicle, each proposing a different take on how a car perceives the environment around it using a range of sensors and act upon these data. Our project reviews these different techniques proposed by multiple already established papers, goes through the different technologies' car manufacturers use in their cars to detect obstacles and actions taken to avoid them and proposed innovative approach to overcome these obstacles.

6- Potato Leaf Disease diagnosis and detection System Based on Convolution Neural Network

For decades, agriculture has been an essential food source. According to related statistics, over 60% of the total earth population mainly depend on agriculture's sources for their primary feed. Unfortunately, one of the disaster problems that affect badly on agriculture production is plant diseases. There are about 25% of agriculture production lost annually because of plant diseases. Late and Early Blight diseases are one of the most destructive diseases that infect potato crop. Although, the late and inaccurate detection of plant diseases increases the losing percentage for the crop. The main approach of our proposed system is to detect early the plant diseases to decrease the plant's production losses by using a diagnosis and detection system based on the Convolution Neural Network (CNN). We used CNN to extract the diseases features from the input images from the supported training dataset for classification purposes. For model training, 1700 of potato leaf images were used, then the testing process is done by using approximately 400 images. Our proposed CNN architecture achieves 98.2% accuracy, which is higher compared with other approaches run on the same dataset.

7- Reference evapotranspiration prediction for smart irrigation

Irrigation is the most critical process for agriculture, but irrigation is the largest consumer of fresh water and causes the loss of large quantities because of the inaccuracy in crop water estimation. Our proposed system aims to improve irrigation management by estimating the amount of water needed by the crop accurately and reduces the number of meteorological parameters needed for such estimation.

Detection of the reference crop evapotranspiration (ET₀) is the most critical process in crop water estimation, that is considered through our proposed solution by implementing machine learning models using neural networks and linear regression to predict daily ET₀ using climate data like temperature, humidity, wind speed, and solar radiation. Comparing our system results with FAO-56 Penman-Monteith ET₀ and cropwat8.0 software as benchmark, show that our proposed system is better than the linear regression model,

in terms of determination coefficient (R^2)=.9677 and root mean square error(RMSE) =.1809, while the multiple linear regression model achieved determination coefficient (R^2)=.68 and root mean square error(RMSE) =3.01. Our system then used the predicted ETo and Crop coefficient (Kc) from FAO, to estimate crop evapotranspiration (ETc) for precision irrigation target.

8- IoT based transportation system with optimized routing

As the population in Egypt is expanding, it is reflected in the increase of the number of vehicles on the road. Public transportation is the solution and the number of available buses can cover a significant amount of the population demand. However, the outdated state of the transportation infrastructure, the static nature of the lines and indistinct schedules create a confounding and unappealing user experience which prompts the users to stray to cars for their needs. So, an Intelligent Urban Transportation System (IUTS) is a must. IUTS is a multi-layered system which provides the solution for most of these problems. It operates on different layers starting from a real time vehicle tracking for transparent and efficient management of assets, cash-less ticketing done through RFID cards, vehicle health and diagnostic data for creation of automated maintenance schedules and a friendly interactive driver interface.

In this project an approach based on combining all these technologies is discussed where the hardware component is implemented based on System-on-Chip technology with custom hardware to interface with the vehicle. The data collected from the on-board unit is sent to the cloud, and with the help of machine learning algorithms the dynamic responsiveness of the system is guaranteed. The proposed system outperforms other existing one through the dynamic and optimized routing feature for the bus navigation to optimize the operating cost but still satisfy the passengers demand.

9- SMART Energy metering using IoT technology

Cairo is one of the biggest cities in the world and heavily suffering from the electrical power problems because demand is much higher compared to generated power. Power load balancing is one of the major problems to ensure minimal impact on end users. Current manual approach proved to be hectic and impacting severely end users and industrial organizations, which lead to economic losses. To meet the increase in demand an average annual expansion in generation and transmission as well as distribution of 2000 MW is needed over the next 20 years. Project in hand aims to design and implement a SMART solution for this demand/supply problem to Accommodates large scale and overcome curse of dimensionality and Enable consumers to self-learn and self-collaborate with neighboring agents. It will help also to Cut down power outage, fuel consumption and the negative environmental effects of congestion and provide consumers with greater information and options for choice of supply.

10- SMART Logistics using IoT technology

Industry 4.0 enables the management of factories manufacturing products with complexity and flexibility. The corresponding logistic services must provide greater accuracy and efficiency in logistic operations. The Internet of Things (IoT) is an important aspect for smart logistics in the context of Industry 4.0. For instance, intelligent logistics models use IoT integrated technologies, e.g. radio frequency identification (RFID), wireless sensor network (WSN) and cloud computing, to enhance the traceability and decision supports of logistic processes in real-time speed, high accuracy, and flexibility. This project focuses on analyzing the related technology roadmaps for the adoption of IoT technologies in smart logistic services. A case research is conducted specifically to identify the relationship between IoT-oriented technologies and deployed advanced logistic services. The logistic operations are organized into an ontology schema based on a four-level service framework. The project proposes a roadmap approach to visualize allocations and evolutions corresponding to logistic services at each level using blockchain technology.

GENERAL ENGINEERING DEPARTMENT

2019\2020



Publications of the GSE Staff during the years 2019 to 2020

Constancy of Speed of Light in Inertial Frames, Hafez A. Radi, Thomas E. Ward,
Abstract: This article proves that speed of light in all uniformly moving inertial reference frames is absolute as postulated by Einstein. This is first done by considering light propagating with a speed c in all directions in an inertial frame of reference. If that frame is moving uniformly with a speed v relative to a second stationary inertial frame, we assume that light in the second frame is propagating in all directions with a different speed $c' = c$. Consequently, modified transformation Equations are formed. The established Poincaré ellipsoidal light waves are then used to find the Equation that governs the relation of c' at any speed v . The analytical solution and numerical calculations to this equation yield a value $c' = c$. This proves that speed of light propagates through empty space with speed c independent of the speed of the light source or the observer. Keywords: Special Relativity, Lorentz transformations, Poincaré Ellipsoidal Light Waves. Applied Mathematics & Information Sciences, Vol 14, No. 3, 375-382, (2020).

Dark Matter: The Problem of Motion, Magd E. Kahil,
Abstract: Dark matter (DM) may be studied through the motion of objects following non-geodesic trajectories either due to the existence of an extra mass as a projection of higher dimensions onto lower ones or as motion of dipolar particles and fluids in the halos of spiral galaxies. The effect of DM has been extended nearby the core of the galaxy by means of the excess of mass appearing in the motion of fluids in the accretion disc. Non-geodesic equations and those of their deviation are derived in the presence of different classes of bi-metric theories of gravity. The stability of these trajectories using the geodesic deviation technique is investigated. Keywords: Dark Matter- Non-geodesic – Non-geodesic deviation, Gravitation and Cosmology, vol 25, issue 3, 268 (2019).

Spinning and spinning deviation equations of bi-metric type theories, Magd E. Kahil,
Abstract : Spinning equations of bi-metric type theories of gravity, the counterpart of the Papapetrou equations of motion are derived as well as their corresponding spinning deviation equations, by means of introducing different types of bi-metric theories. The influence of different curvatures based on different connections is illustrated. A specific Lagrangian function for each type theory is proposed, in order to derive the set of spinning motion and their corresponding spinning deviation equations. Keywords: Bi-metric; Geodesic; Geodesic deviation; Spinning equations; Spinning deviation, Indian Journal of Physics (2020) <https://link.springer.com/article/10.1134/S0202289320030093>

Spinning Equations for Objects of Some Classes in Finslerian Geometry, Magd E. Kahil,
Abstract: Spinning equations of Finslerian gravity, the counterpart of the Mathisson-Papapetrou spinning equations of motion are obtained. Two approaches of Finslerian geometries are formulated and discussed, the Cartan-Rund and Finsler-Cartan ones, as well as their corresponding spinning equations. The significance of the nonlinear connection and its relevance on spinning equations is noticed, and their deviations are examined. Keywords: Spinning Equations- Spinning Deviation Equations- Finsler Geometry, Gravitation and Cosmology, vol 26, issue, 3, 241 (2020).

Motion in Clifford Space, Magd E. Kahil,
Abstract: Clifford algebra as an approach of geometrization of physics plays a vital role in unification of micro-physics and macro-physics, which leads to examine the problem of motion for different objects. Equations of charged and spinning of extended objects are derived. Their corresponding deviation equations as an extension of geodesics and geodesic deviation of vectors in Riemannian geometry have been developed in case of Clifford space. Keywords: Clifford Space, Poly-Vectors-Geodesics, Geodesic Deviation, Spinning Objects, Extended Object, Journal of Modern Physics (2020) 11,1865 <https://www.scirp.org/journal/paperinformation.aspx?paperid=10423>

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