Faculty of Engineering

Graduation Projects

Mapping with SDGs

Year 2019-2020

Electrical Communications and Electronics Department

Graduation Projects of the Academic year 2019-2020

No		
		
1	**Project Title**	**Cancer Detection with Deep Neural Networks**
	Students' Name	Mariam Mohamed Amina El Haggan
	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. Lung cancer has been the world's most common incidence and mortality cancer since 1985. In recent years, Deep Learning, Machine Learning, and Artificial Intelligence are the main highlight in the conceptions of data science. The emergence of deep learning algorithms like CNNs provides great opportunities for the automation of medical image processing. The principal purpose for using DL systems is to improve the precision, decrease diagnosis time, and to identify the location of nodules and characteristics of the nodule. A lot of studies for computer aided diagnosis use have been carried out for lung cancer detection systems. However, the CAD structures must be improved a lot to recognise the different nodular types and better responsiveness, precision and accuracy. 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.

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2	**Project Title**	**Cardiovascular Disease Detection using machine learning**
	Students' Name	Samar Sameh Heba Khaled
	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. The system is powered by certain machine learning algorithms and enforced by image processing in order to diagnose an input ECG file supplied by the patient through a website which relays the file to a pre trained model that resides in the backend of the website (server). When the server analyzes the file it generates a report stating the condition of the heart and the suggested solution which is then sent to the patient E-mail address. By using such algorithms, the system is going to be more accurate and saves much time and effort for both the patient and the doctor. This service will minimize the cost needed to generate a report for an ECG session as well as minimizing the misdiagnosis caused by the medical malpractice found in medical institutions.

No		
3	**Project Title**	**Early Deep Detection of Diabetic Retinopathy**
	Students' Name	Mostafa Ali AbelRahman Medhat
	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. Diagnosis of DR using retinal fundus photographs is usually done by ophthalmologists who investigate the appearance and significance of many subtle characteristics, a procedure that is complex and time consuming. Because there are several undiagnosed and untreated cases of this disease, Diabetic retinopathy screening for all diabetic patients is a major challenge. Convolutional neural networks (CNNs) have been used increasingly for computer vision projects and medical image analysis. Past work has been done using deep learning models and frameworks to automatically detect diabetic retinopathy. However, such techniques used very large CNNs requiring enormous computing resources. Therefore, it is necessary to develop more computationally efficient deep learning frameworks for automated DR diagnosis. 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.

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No		
		
4	**Project Title**	**Pedestrian Detection**
	Students' Name	Ahmed Akram Ahmed Khaled Ibrahim
	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 models 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.

No		
		
5	**Project Title**	**Early Earthquake Detection with Deep Neural Networks**
	Students' Name	Marwa Mahmoud Aya Emad
	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.

No		
		
6	**Project Title**	**A Smart Cane with Artificial Intelligence for the Visually Impaired**
	Students' Name	Mostafa Rahiim Marwan Hesham
	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 discovers obstacles and alerts the blind. Our research aims to devise a smart cane to assist the blind in motion by using micro-controller (Raspberry Pi) and other components such as ultrasonic sensors. The main constituents of the independent travel are object detection and awareness. The research has two parts: the first part is about image processing by the use of deep learning algorithms and techniques, in order to inform the user what the object in front of him is and the distance between the user and the obstacle. We used deep learning to get more accuracy, as sometimes it exceeds the human-level performance. We also used deep learning as we believe that embedded systems by itself does not provide a smart enough system, we will explain why throughout our researches. In deep learning, we train the computer model by providing it a huge amount of labeled data and different neural network architectures. Deep learning consists of back propagation, Activation functions, output layers, input layers, and hidden layers. The second part is the implementation where three ultrasonic sensors were used which detect obstacles that face the user from three different directions by alerting him/her using vibration and buzzer. This thesis is focused on the support for individuals with visual impairments to navigate indoors and outdoors.

No		
7	**Project Title**	**Deep Lanes autonomous vehicle**
	Students' Name	Amro Maged Hussein Mohsen
	Supervised by	Dr. Mohamed Gamal
	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. Lane detection is one amongst the foremost valuable inventions as a result of it helps minimizes crashes with the expansion of urban traffic. Yet, it's one amongst the foremost difficult as a result of the varied changes of road conditions. However, there have been previous approaches to lane detection that accomplished an excellent success and illustration. during this paper, an extra descriptive approach can examine the constraints. the most justification of This paper is to construct lane detection underneath previous limitations and banish all of the obstacles considering errors.

No		
		
8	**Project Title**	**Deep Vehicle Detection**
	Students' Name	Ahmed Khaled Abdallah Ibrahim
	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. The first stage classification: proposing a modified implementation of VGG16 and ResNet50 to be the backbone of Detection networks. Second stage detection: proposing a modified implementation of YOLOv3 and YOLOv4.the last stage is depth calculation using a novel 3d network called frustum PointNets. Although the vehicle detection not a novel topic, it still suffers from problems, such as low detection accuracy and speed problems. So, we need to modify a vehicle detection project with an effective real time processing. Our objective is to produce a Vehicle detection project with an efficiency higher than 94% increasing the presence accuracy due to Advanced driver-assistance systems (ADAS) sensors and Image processing using Machine Learning " by 5%+" to make a sufficient transformation from Advanced driver-assistance systems (ADAS) to autonomous driving (AD), and to avoid the main cause of the accidents which is the human error.

No		
9	**Project Title**	**Be My Eyes**
	Students' Name	Salma Ahmed Amira Hassan
	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. In addition, there is an ultrasonic sensor used in case of nothing in front of the user, but there is something in the two sides so there is an alert from the object side given by the earphones which mean if the object is coming from the right so there is a tone generated from the right earphone and the same idea for the left one. There is also a push button is used in case of emergency, so if the user in a panic situation he will press the button asking for help from the nearest contributors in the same area of the user through location service API. By implementing the proposed system, the blind will be able to roam the streets without the need of any external assistance.

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No		
10	**Project Title**	**A Brain Controlled Wheelchair**
	Students' Name	Sherouk Tarek Nayera Hassan
	Supervised by	Dr.Ahmed Diaa
	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 mind wave 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. The proposed system consists of a portable EEG headset, MCU and software signal processing together facilitate the movement of the wheelchair by processing the user's brain activity using an embedded system. This system is designed to save time and energy of the user.

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No		
		
11	**Project Title**	**Energy saving in homes**
	Students' Name	Abdlrhman Ibrahim
	Supervised by	Dr.Ahmed Diaa
	Abstract	Electricity Consumption is a great problem which all the world suffers from it. Governments always searches for a suitable solutions to decrease the consumption from it they have sector that is not always fixed or could not be controlled because it depends on the people daily life which is electricity consumption of houses, and another sectors as street lights, offices and factories they always tried to decrease the consumption from them by finding a new lamps that consume less power and new devices that have the same efficiency but with the less power consumption for example: They started to relate the operating of the lights in the streets and public places with the motion of the people and vehicles to decrease the power intensity when there is no motion, and others searched for a new power source as solar cells and winds power because its clean and renewable. 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.

No		
12	**Project Title**	**EMG to control a robotic arm for disorders**
	Students' Name	Amira Elhamy
	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. Simple algorithms have been implemented to detect electrophysiological signals such as eye saccades, blinking and eye closure events. Electrooculography (EOG) is one of the most useful systems for providing information on the activity of the human eye by detecting changes in the position of the eye. EOG is based on the fact that the eye functions as an electrical dipole between the positive potential of the cornea and the negative potential of the retina. Low cost, flexibility and high performance makes the EOG the most efficient system available. There are three opposing pairs of muscles connected to the eye globe to create an eye movement along any axis. These muscle sets work to drive the eye horizontally as well as vertically as for the eyeball's rotational movement. EOG is a technique used to measure the residual potential of the retina by analyzing the surrounding muscles. The amplitude values of the EOG signals differ between 50 and 3500μV. Gaze angles differ linearly with ±300.Measuring the voltages of electrodes positioned around the eye, eye saccades, or eye blinks that because potential variations may determine the potential in the eye. This approach has been used in the area of rehabilitation of activities such as virtual keyboards, wheelchair commands and robot hand grip control. 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 .

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13	**Project Title**	**Real-Time Depth Estimation and Lane Detection System Based on Machine Learning**
	Students' Name	Hazem Ahmed Omar Hany
	Supervised by	Dr. Mohamed Saeed Darweesh
	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 overcame 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. A deep learning network deals with the frames from the camera to detect cars. Another computer vision algorithm parallel with deep learning provides information about road lanes and the path equation to make sure that the vehicle stays oriented. After deep learning network finishes its work, there is a computer vision algorithm whose responsibility is to determine at which lane each detected car is moving and what is the relative speed of these cars, also classifies the cars according to the danger level represented by each car. 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.

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14	**Project Title**	**Diagnosing Malignant versus Benign Breast Tumors**
	Students' Name	Nada Magdy Ali Maher
	Supervised by	Dr. Mohamed Saeed Darweesh
	Abstract	Breast-cancer is the type of cancer that occurs mostly in females which leading to high mortality rates as a result of the disease. Additionally women breasts are more susceptible to developing cancer. Breast cancer is the product of irregular behavior of natural breast cell functions. Accordingly, the cells of the breast appear to grow out of control and form a tumor ,the tumor can the patient fell it like mass which appear in the breast like a lump. Moreover, symptoms of breast cancer are still undetected. That is why regular breast screening routine is so essential and it is equally important to improve the detection methods as well. Early detection and diagnosis of the tumor can help in increasing the survival rates the prediction that having this disease. 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 patient's 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.

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15	**Project Title**	**Smart fire fighter robot**
	Students' Name	Mustafa Hesham Mohamed Osama
	Supervised by	Dr. Mohamed Saeed Darweesh
	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. The project built upon NVIDIA Jetson Nano GPU kit and a single mono camera integrated with ultrasonic sensors. We will use machine learning to detect and identify the fire with the frames from the camera. Finally, the proposed system was built to rescue as many lives by sending an early warning if there are any expected danger fire accidents and at the same time the robot provides the actions needed either by Extinguishing the fire or to reduce fire expansion in the worst case which would help firefighters to deal with fire later.

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16	**Project Title**	**Intelligent Crash Avoidance System for Road Intersection Based on Machine Learning**
	Students' Name	Ramy Mohamed Sayed Hania Ahmed Farouk Ammar
	Supervised by	Dr. Mohamed Saeed Darweesh
	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. According to the Global Health Organization nearly 1.3 million people die internationally every year from car accidents and in addition up to 50 million are injured or disabled. And specially in Egypt we lose about 12000 lives from car accidents every year. Therefore Global Health Organization ranked car accidents as a 9th leading cause of death and predicted to become the 5th leading cause of death by 2030. And according to Federal Highway Administration reports 50% of series collisions happen in road intersections and 20% of them are fatal collisions. Therefore the crash rate in road intersections demonstrate the need for a fast and accurate collision detection system. So in our proposed system we will work on increasing the accuracy of detecting di↵erent 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.

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17	**Project Title**	**Autonomous hospital**
	Students' Name	Mina Kamil
	Supervised by	Dr. Mohamed Saeed Darweesh
	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. Therefore, in addition to optimizing nurses' time in patient care, it will also help all patients using wheelchairs to move independently with more freedom. Objects would move using an embedded system following a lined map already stored in memory. The microcontroller then decides the route using AI algorithms to guide the patient where they want to go with just a click. This would lead to a more advanced hospital system that can automate some time-consuming tasks such as moving around wheelchairs, food trays and beds.

No		
		
18	**Project Title**	**Autonomous Braking System for Cars using Machine Learning Algorithms**
	Students' Name	Ahmed Azab Elsayed Mohamed Azab Mark Nagy Saad Morcos
	Supervised by	Dr. Mohamed Saeed Darweesh
	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.

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No		
19	**Project Title**	**Intelligent agriculture detection of harmful pests based on machine learning**
	Students' Name	Ahmed Abdelhadi Taha Aboel Naga Youssif Amr Mohamed
	Supervised by	Dr. Mohamed Saeed Darweesh
	Abstract	The world population depends heavily on the agricultural products for survival as source of their food. The main agricultural products around the world are Rice, Wheat, Maize and potatoes. Potatoes are the fourth most important crop around the world representing 15% of the world's agricultural production with an estimated production of 3.9 tons in 2017. Egypt is placed in the 19th place in production of potatoes worldwide. As every crop, There are diseases which affect the potatoes and their production so it is important to take into consideration their detection and management. 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.

No		
		
20	**Project Title**	**Autonomous train to shuttle between stations**
	Students' Name	Sherif Magdy Farouk Ahmed Fouad
	Supervised by	Dr. Hatem Zakeria
	Abstract	Transportation acts as one of the most important fields in our life, but it faced 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. This idea decreases the percent of collision over than 75% which will be secured other developing projects for the train or railway.

No		
21	**Project Title**	**Automatic Detection and Notification of Potholes and Humps on Roads to Aid Drivers**
	Students' Name	Mariam Gobrial Sara Hesham
	Supervised by	Dr. Hatem Zakeria
	Abstract	One of the causes of local road accidents in developing countries, such as the 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 pothole 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 the 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. Ultrasonic sensors are used to identify the potholes and humps and also to measure their depth and height, respectively. Furthermore, the system can be installed in a moving vehicle to automatically detect and report potholes and humps via image-processing of Raspberry-Pi microcontroller. Integration of several image-processing schemes has been used to produce an algorithm using Python Language from the Open CV library that can detect and report potholes automatically from a moving vehicle. The reported image of the pothole and its location are stored and viewed through the use of the IoT. The system will be applied for low speed vehicles during daytime. With a rate of about 8 frames per second, images were processed per frame to detect potholes by analyzing its structure. The proposed system captures the geographical location coordinates of the potholes and humps using a global positioning system receiver.

No		
		
22	**Project Title**	**Mind Controlled Wireless Robotic Arm Using Brain-Computer Interface**
	Students' Name	Nada Mukhtar
	Supervised by	Dr. Ghada Abdel Mouez
	Abstract	Among the previous studies of the world health organization there are about 10 million 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 solution that has been developed to serve disabled people with amputated arm is Brain Computer Interfaceace (BCI).brain-computer interfacaces (BCIs)-based motor imaginary (MI) is a communication technology using EEG (electroencephalograph) signals generated by visualizing a performance of a particular action to enable the user to send commands to an automated system, such as robotic arm using her/his thoughts to express themselves by encoding of two MIs which are represented in right-and left-hand movements. In this project we have used EEG headset to detect electric signals from the brain. The raw signals is transmitted by Bluetooth to be processed and classified by using Random Forest (RF) in Python. 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 microcontroller 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 and medical field.

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23	**Project Title**	**Clever-Bot Carolina**
	Students' Name	Mohamed Mahmoud Elshrkawy Kareem Atef
	Supervised by	Dr. Ghada Abdel Mouez
	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 application as the personal assistant systems including operating machine through voice and Voice search.

No		
		
24	**Project Title**	**Electronic ID card based on digital signature**
	Students' Name	Ahmed Mohamed Arfa Ibrahim Khalil Mahmoud Mohamed Shakib
	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 ulnerable 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). That helps increasing the security level as if the card is stolen the thief can't access the information without the digital signature of the card's owner, and if the police wants to know everything about the person they won't have difficulty finding anything they are looking for Keywords: Python, QR code, digital signature.

No		
		
25	**Project Title**	**Car Security System**
	Students' Name	Aly Hesham Zeyad Hisham
	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 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. 1st we used facial recognition by using two cameras one on the outside door and the other one is inside the car fixed in the dashboard. for the outside camera it only opens when the someone grabs the handle of the door then it captures his image if it's the owner of the car the door unlocks if it's someone other than the owner then the door won't open and also a message will be sent to the owner's phone warning him about it. now to the 2nd step the weight measurement. When the door unlocks the owner sits on his seat and there is Slant gauge that measures his weight of course at first owner has to set it up within a certain range. if the owner's weight is within this range and the picture taken from the inside camera were both were the same ones as the ones were set up in the database from the start then the engine of the car will start and if not then it is required from the user to enter a pass code through a keypad that is installed in the car and that was the last and 3rd step. if the pass code that is entered was wrong then another one is sent to the user's phone and it will go on like this until he gets it right if he doesn't get it right then the engine won't start which means that the car will still be safe and secure. the whole system depends on the main processor which is the Raspberry-Pi. and of course a GSM network connection is required to use the one time pass generation (OTP) code that is sent to the owner's phone. All the components of the system run on a 12v 10 Ah battery that is on standby 24h per day not on the car battery itself. So basically our system is well protected as it provided more security by adding a couple of authentication security steps to the previous systems that uses maybe one or two of these steps which provides more security than the other systems and that will make it near impossible to steal cars or break into them.

No		
		
26	**Project Title**	**Digital Wireless Audio Communication System (DWACS-T)**
	Students' Name	Abdelrahman Mohamed Ahmed
	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. So, to choose the best transmitter considerations of digital modulation, sections of needed transmitter, and circuits should be recommended. So, in this project a paper with circuit simulations and hardware implementation will be proposed for helping to choose the suitable transmitter for an audio transmission. For higher performance communication systems.

No		
		
27	**Project Title**	**Safety and Health Device**
	Students' Name	Nada Mohamed Hosni Amira Ashraf
	Supervised by	Dr. Mohamed 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. Several systems offer solutions to these issues, so the problem is not the lack of solution, but it lies in the details of these solutions, several requirements were considered while designing the proposed work, that will fill the gaps in these solutions (e.g. privacy, reliability, practicality, power efficiency). The proposed system would be of help in this matter; it would be composed of a microcontroller, sensors, and GSM/GPS module. The device's process can be activated by either one of two modes, automatic or manual. The manual mode is triggered by a push button while the automatic mode would be triggered by abnormal readings of the sensors. When the process is triggered, the device would locate the user and send the location, audio recorded, and biometric readings to pre-selected contacts. In addition to a web server for the previous data to be uploaded on it, to serve as a medical history and to be easily reviewed anytime. 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.

No		
28	**Project Title**	**Biometric Attendance System**
	Students' Name	Mostafa Mahmoud El Sayed Ahmed Taha
	Supervised by	Dr. Fathy Zaky
	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. After sending their count to the supervisor the second process is capturing an image of the students in the classroom through a HD CAM, after that the supervisor detects if the faces detected in the image is matching with student's images saved at the database if they are matching then recording the attendance for them. This proposed system is more accurate, secure, and will improve the educational level for the students because they have to attend the lectures regularly as they cannot cheat because this system depends on facial recognition through image processing so the student has to attend the class.

No		
		
29	**Project Title**	**Traffic Sign Recognition System**
	Students' Name	Abdullah Sameh Mohammed Amr Nasr Eldin Othman
	Supervised by	Dr. Fathy Zaky
	Abstract	Autonomous vehicle driving systems (AVDS) recognize potential dangers, threats, driving limitations and possibilities. One of the key factors for a successful AVDS development is to identify appropriate traffic rules valid on a certain road sector or in a junction. Such a visual recognition helps auto navigation or navigation assisting systems to be more safe, because the most of car accidents occur due to lack of concentration and failures to notice important traffic signs. Traffic sign recognition (TSR) is one of the most important background research topics for enabling autonomous vehicle driving systems. 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. This challenge get more difficult to meetin a city like environment where multiple traffic signs, ads, parking vehicles, pedestrians, and other moving or background objects make the recognition much more difficult. 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.

No		
		
30	**Project Title**	**Weather monitoring system**
	Students' Name	Abubakar Abdi Dirie Egal
	Supervised by	Dr. Fathy Zaky
	Abstract	Weather monitoring and prediction has been and will continue to be important to man in 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 the more 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. Although this has improved our weather monitoring abilities drastically there are still many improvements to be made for the future. This project will delve on how current systems work while highlighting their main downfalls and inefficiencies. With the introduction of IOT there is a huge demand for real time weather data that could potentially saves lives of millions. This can be achieved and help in giving immediate hazard warnings of incoming blizzards, excessive winds, heat waves, heavy rain etc… through a cheaper alternative real-time system. This is the main objective my system which attempts to accomplish the merging of the IOT with weather monitoring. This is going to be achieved by collecting data coming from input sensors which is then read by a server and then stored. The sensors gather readings of various environmental parameters and deliverit to the Arduino acts as a base station. The Arduino then transmits the data using the Wifi and the processed data is displayed on laptop or desktop through accessing the server.

Graduation Projects of the Academic year 2019-2020

No		
		
31	**Project Title**	**Smart Office System**
	Students' Name	Mohamed Belal Khaled Omar
	Supervised by	Dr. Fathy Zaky
	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. The Raspberry Pi is integrated with temperature sensor, human detector, light detector, camera module, and smoke detector. This sensors will have the ability to get the office environment, and give alarm in abnormal situations. Also the system will have control over the light and air conditioning system.

No		
		
32	**Project Title**	**Multisensory system to enhance railway safety**
	Students' Name	Ahmed abdelrahman Adham sameh shehata
	Supervised by	Dr. Fathy Zaky
	Abstract	In our country Trains travelers have constantly confronted perilous factors and dangers on the rail roads. 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. Some electronic frameworks were proposed in the previous barely any years to help increment and cement the wellbeing of the railroad framework yet all had basic blemishes. A few frameworks could deal with congratulate the trains 'flow and upgrade the correspondence framework between them. Some could recognize mishaps however couldn't help with the route or diminish the interruptions. Furthermore, some others saw the most ideal approach to forestall mishaps is to control cross entryways as it were. Every one of the past frameworks focused on just a single viewpoint and none of them was even the best answer for that angle. 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.

No		
		
33	**Project Title**	**Smart Home Automation**
	Students' Name	Abdelrahman Mohamed Atris Mohamed Khalefa
	Supervised by	Dr. Fathy Zaky
	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. The main concept of the project is to connect the microcontroller to humidity and temperature sensor to get the environmental conditions in home rooms, the servo motor will be used to control the door opening and closing. As well as, the gas sensor will be used in the home kitchen to determine the presence of any gas leakage. Moreover, the motion detector will detect human presence inside the rooms in order to turn on or off lights in the rooms using light sectors. Also, a fan will be used as the rmoregulator in case of high temperature.

No		
		
34	**Project Title**	**Desktop PCB fabrication kit**
	Students' Name	Mahmoud Azema
	Supervised by	Dr. Fathy Zaky
	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. After implementing such system, the process will start by sending the design file by the user to the software program on the PC in order to convert this file to zeros and ones' file array. The user must connect the PC to the machine by USB port. Once the microcontroller receives the design file format array, it will check the format of the file and gives order to motor drivers and laser module to start. When the DC motor moves, the UV laser light will cure the UV coat on the copper board byte by byte while it reaches the limits of each line. In this time stepper motor will move step by step to move the PCB to make the printing increment to the next line till the end. Now the design of the PCB layout is printed on the PCB. Now the user must put the PCB in solution to remove excess copper. All of these steps will take a maximum of 20 minutes and don't need a few steps to be performed, just a PC have running at least windows 7, a copper board with UV coating and USB Port. This machine will print smallest line width of 0.1 mm by using a 405 nm wavelength UV laser to give the user the flexibility for designing smaller board and produce an accurate output. In addition, this design makes the machine more portable. All of these advantages will make the engineering students or any researcher do their experiments on any electronic device or prototyping PCBS more easily than before.

No		
		
35	**Project Title**	**Smart Restaurant**
	Students' Name	Ahmed fahim Elharty Mohamed Ahmed Mohamed Ammar
	Supervised by	Dr. Fathy Zaky
	Abstract	With the spread of technologies people seek for better and faster services specially catering services at the restaurants, as the traditional catering services has a lots of problems that make the customer unsatisfied, also it cost the restaurant more money. These problems are like for example when the waiter take the order from the customer, he may write down a wrong order or he may deliver the order to a wrong table, and if the place is crowded it will take the waiter along time to take all the orders from the customers. All of these problems will waste the customer time, and cost the restaurant money. So to avoid these problems some smart systems showed up with some solutions, like placing a touchscreen on each table for the customer to make his/her order through it, then the order will show up on a screen at the kitchen, also there is a system has a tablet instead of the touchscreen. Another system depends on an android application, so the customer has to download the application of the restaurant to be able to make his/her order. All of these solutions are insufficient, as it still cost the restaurant more money because it has a lot of hardware and these hardware needs a regular maintenance, make the system not expandable as it requires more hardware to add an additional table and the system with the android application force the customer to have an android device. 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.

No		
		
36	**Project Title**	**IoT Based System Agriculture**
	Students' Name	Ahmed Adel Abdelhamed ElMenshawy Ali Mohamed Hussein
	Supervised by	Dr. Fathy Zaky
	Abstract	As the world is trending towards new technologies and implementations it is a necessary 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. IOT is a shared Network of objects where these objects interact through Internet. One of the important applications of IOT is Smart Agriculture. Smart Agriculture reduces wastage of water, fertilizers and increases the crop yield. Here a system is proposed to monitor crop-field using sensors for soil moisture, humidity, green color intensity and temperature. By monitoring these parameters the irrigation system using pumps can be automated if soil moisture is low.

No		
37	**Project Title**	**Home Security System**
	Students' Name	Marawan Mahmoud Anwar Osman Aly Mohamed Adly Ghazaly Hamed
	Supervised by	Dr. Fathy Zaky
	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. This proposed system has main functions which are achieved through an Arduino, which is connected to a number of sensors and an SIM module, as well as a buzzer which notifies the user that an intruder has entered the property. The system can be activated and deactivated through a keypad. The system also features an IP camera and a recording camera which turn on and starts to record once an intruder has been detected. After applying the proposed technique, the reliability is expected to increase significantly and the accuracy level as well. The system can also pick up clear and vivid images/video even in poorly lit areas since a lighting system is installed and functions once the intruder is detected. This feature may not be included in the current security systems.

No		
38	**Project Title**	**Vehicle to vehicle communications using visible light communications**
	Students' Name	Abdallah Khaled
	Supervised by	Dr. Hossam Selmy
	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 grad II. Finally, the paper is summarized.

No		
		
39	**Project Title**	**Realization of indoor visible light communication network"Li-Fi**
	Students' Name	Ayat Momen Aboelmagd Nourhan Mostafa zaghloul
	Supervised by	Dr. Hossam Selmy
	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 Christion 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 sociologists whose interested in study the public behavior refer this decrement to this reasons that the museums remain stuck in old ways for guiding tourists. Also the static nature of museum no longer attractive in the dynamic world full of screen that we live in now. 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. The system work by installing a LI-FI circuit above every antique or statue in the intended exhibition /museum this circuit consist of microcontroller that responsible for collecting the data of the related artwork from the server through a Wi-Fi module, then store it on a memory card until sending it in a form of bits loaded on the light of the LED using a led driver circuit. this li-fi transmitting circuit will be embedded with the lighting system itself that surrounding each artwork/statue in the exhibition/museum. The of the system is that the receiver circuit that consist of a photo diode that will realize the data that leaded within the light. Then passed it to a current voltage amplifier transforming it into voltage. the volt will pass through a dc blocker to illuminate the noise from the signal. After amplifying the signal, it will send in form of presence and absence to voltage using on/off transistor to smart phone device using an on /off transistor. The third and the most important part of the system, is the android mobile application that will preview users the historical information in a digitalized form. through this mobile application user can receive a multimedia (text, audio, video) illustrate the history of the antique/artwork he is front of in an attractive way. by applying the proposed system to the Egyptian museums.it will able to attract more visitors who want to know more about the rich valuable Egyptian history that's exist in its museums .By integrating the ancient antiques with the new LI-FI technology to preview its history .that will be an attractive to tourist who passionate in history and also search for the new ways of digital entertainment .the proposed system will send the historical/culture information in a very interesting way(audio ,video ,text) to the visitors mobile .this new technology used for transferring the data allow Egyptian museum's to embrace more about its civilization .satisfying the curious of the tourist who came to this place to know more about the magnificent Egyptian history . the system enabling the museum to send much more information about the statue /the artwork to visitor tourist. Also at the end of the tour visitors can keep the received files on their smart phones.

Graduation Projects of the Academic year 2019-2020

No		
		
40	**Project Title**	**Design a Bluetooth Beacon for Real Time Indoor Positioning System**
	Students' Name	Mazen Mostafa
	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 smart phones 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.

No		
41	**Project Title**	**Design and Implementation of DS Spread Spectrum Transceiver**
	Students' Name	Mohamed Gamal Ali Mahmoud Hesham
	Supervised by	Dr. Kamel Abdel Fattah
	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 dispreading the signal at the receiver to retrieve the original message. This spreading code with much higher frequency than the data input to spread the signal across the wider frequency band to make the signal hard to detect and bury the useful information in noise CDMA (Code Division Multiple Access) is a communication technique that allows multiple users to communicate at the same time over one frequency. In CDMA, each user is given a unique code. To ensure the minimum levels of interference orthogonal spreading codes must be used. Being orthogonal, the different CDMA signals are able to operative with little mutual interference, The CDMA spreading codes are used to increase the bandwidth of the signal to gain the benefits of spread spectrum communications.

Graduation Projects of the Academic year 2019-2020

No		
		
42	**Project Title**	**IoT Based Automatic Vehicle Accident Detecting And Rescue System**
	Students' Name	Ahmed Ibrahim Mohamed Hossam
	Supervised by	Dr. Kamel Abdel Fattah
	Abstract	In highly populated Countries like Egypt, everyday people lose their lives because of accidents and poor emergency facilities. Some of the rescue teams face difficulty in reaching the injured people to due late alerts and insufficient information of the specific accident location. The advent of the mobile phone and Internet of Things (IoT) industries reshaped the way people communicate and brought a paradigm shift to public and private services. This ever-evolving technology marked the beginning of new era affecting the lives of people and various businesses. 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.

No		
43	**Project Title**	**Wearable Antenna**
	Students' Name	Mohamed Amr Gamal
	Supervised by	Dr.Mohamed Ismael
	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 ommunication functions, which incorporates following and navigation, mobile computing and public safety and used for health observance Advanced info and communication technologies, providing anyplace and anytime property, play a key role within the development of a fashionable care systems varied on-line systems for observance this sort of solutions ar 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.

No		
		
44	**Project Title**	**3D Printing**
	Students' Name	Ahmed Osama elsebaey Mahmoud El Sherif
	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. The project machine is basically designed with the aim of printing components and parts using Plastics. This system gives flexibility to the material. It can also provide a cost-to-size ratio. The machine is continually made greater and cheaper, due to the low cost of the part and the simple designs involved. Other printer styles cost a lot more per unit area of build volume, simply because they are hard to scale up and the main components are still expensive. Finally, all the solutions require trained personnel to be available beside the machine to load and control the printing process which consumes a lot of man power as well as cost. On the other hand, the proposed system can be controlled through a web interface which controls all aspects of the system as well as reporting a summary of each job to the user through the server. Using such remote capability enables only one user to control multiple machines at once effortlessly with minimal unexpected events.

No		
45	**Project Title**	**Wireless Health Monitoring System using IoT**
	Students' Name	Hossam Medhat Hassan Islam Ahmed
	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. The healthcare system is currently undergoing a cultural shift from a traditional approach to a patient-centered, modernized approach. The main role is played by healthcare professionals in the traditional approach. 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 and compares reading with normal reading, so if it is anomalous, reading will be sent to the doctor by massage, alarming the patient and the doctor, but if it is normal, reading will be recorded and displayed on the website monitor.

No		
46	**Project Title**	**Monitor and Control of Greenhouse Environment**
	Students' Name	Abdelrahman samy abdelgalil Ramez Ashraf Maher Saad
	Supervised by	Dr.Maher El Tayeb
	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. Applying novel technology in the field will solve main issues in agriculture. IoT is one among the fastest growing technologies. The IoT concept is applicable to all fields like automation, industry, electrical, electronics, health care, tracking systems etc. In case of plant growth automation is necessary to monitor several environmental conditions. The Proposed system is based on monitoring and watering system for agriculture field based on Internet of Things which help the farmers to apply new modern methods, can increase their income with less manual work. Now a day's traditional agriculture is changing to a modern agriculture. Currently many agriculture applications are existed which became a business. Improvements in agriculture contribute to the national economic growth. 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.

No		
		
47	**Project Title**	**Monitoring and Controlling Smart Tank using IoT**
	Students' Name	AbdelRahman Mostafa Mohamed Ahmed Atef
	Supervised by	Dr. Mahmoud Ali
	Abstract	The water needs have increased unpredictably throughout the world during the past few decades. This increasing demand of water supply has become a major challenge especially in Egypt. We present an IoT based design for water monitoring and control approach which supports internet based data collection on real time basis to overcome this challenge. The device comprises of: a computer system (Central Hub), the IOT Module, and the switching unit . 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, the 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. A prototype has been made for this project. So, in this way manual intervention is not required for continuous water supply. The main aim of this project is to determine the humidity for water vaporization inside the tank, and the water contamination using the RGB sensor and PH sensor, the water level using the ultrasonic sensor, and control the water level using the water pump.

No		
48	**Project Title**	**Microwave power divider**
	Students' Name	Ahmed Essam Awwad Aly Mohammed Essam Aldin abdelrazik ali
	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 3 dB, 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 meta material power divider using new techniques to relate it with a compact size related to the traditional power dividers for microwave applications. The composite right/left handed (CRLH) meta material (MTM) has extraordinary characteristics especially in controlling frequency, phase and size. The power divider will be designed and integrated with phase shifters and array antennas to be suited for subsystem projects for wireless applications, and will be operating on wide frequencies, hence the composite right/left handed (CRLH) metamaterial (MTM). This research thesis is concerned with designing a compact power divider to be used in microwaves applications using the composite right/left handed (CRLH) metamaterial (MTM). Such design is to be simulated on CST, and its circuit is to be designed on ADS, and then it is to be fabricated and measured for the proposed system.

Computer Systems Engineering (CSE)

Graduation Projects of the Academic year 2019-2020

No		
1	**Project Title**	**Ernutet Web Application**
	Students' Name	Abdallah Abdalaziz Ali Hassan
	Supervised by	Dr Ahmed Ayoub
	Abstract	This project aims to design and implement an online business hub (web application) that aims to encourage, connect and match individuals as well as entities, in order to facilitate the procedures between them. This Enables investors to be matched with preferred startups and entities to invest in according to their preference and vice versa. Supports partner-seekers and entities to find the best match according to their partnership preference. Enables project owners to crowd fund their projects in a secure way. Matches employers with their preferred freelancers and vice versa in a secure platform. Ernutet gives the opportunity to all kinds of investors, accredited and non-accredited, to invest through our platform

No		
2	**Project Title**	**SMART product insurance**
	Students' Name	Shady Ashraf Kamal Gabra - Ahmed Zakaria Sayed Abou El Ela Kotb
	Supervised by	Dr Samer Ibrahim
	Abstract	The insurance business is all about data, with the available amount of data increasing at a high rate. At the same time, with the rise in cloud computing, data storage and processing costs continue to tumble. This as an opportunity which many insurers see and want to take. The ability to apply internal, external, and behavioral data to add value across the insurance lifecycle is what they want because the possibilities are endless. Since data is tiresome to work with because it needs to be sourced, extracted, stored, and analyzed to provide value, it is difficult to craft it into a commercial asset. In the design of a new product, market segmentation, product design, and product success, a determination needs to be taken into consideration. Smart Product Insurance needs to enable insurers to increasingly use non-obvious data and analytical data to guide the design process, identify attractive targets, and find the right signal. Main operational systems provide pricing, underwriting, claims, policy, and billing services. This insurance should enable insurers' main systems to consolidate and monitor their operational data and then apply analytical data to provide actionable insights where decisions are to be made.

No		
3	**Project Title**	**Smart school bus monitoring**
	Students' Name	Youssef Alaa El Din El Sayed Ahmed Shehab
	Supervised by	Dr Ahmed Ayoub
	Abstract	It is vital for every school to ensure safe transportation of their students to be trustworthy, secure and to gain a good reputation. School administrations need to be continuously updated of their student's situation and avoid any accidents. However, if an accident happens, they should be able to contact parents, update them in real time and tackle the problem. This is where the smart school bus monitoring takes place. The proposed system works by giving each student an RFID tag that contains student's information through a database which is accessed by a microcontroller when the student enters the bus and passes an RFID card reader. In addition to this, the system uses GPS technology through GSM in order to find the bus speed and geographic coordinates of the location it is currently at. Then, parents can access this information through a mobile application and contact the school administration if there's any discomfort or a problem. School administration also have access to the mobile application to monitor the bus drivers and contact them to obtain student's safety. Therefore, the proposed system provides real time tracking of buses and provides safety

Graduation Projects of the Academic year 2019-2020

No		
		
4	**Project Title**	**SMART Logistics System**
	Students' Name	Muhammad Hesham Muhammad Hashad
	Supervised by	Dr Samer Ibrahim
	Abstract	Unraveling some of the modern day needs for the industrial revelations requires thorough and keen eyes to be able to identify and address these issues using modern day technologies. Primarily focusing on the pharmaceutical industry, many studies found that in developing regions of the world like Asia and Africa, countries are facing a massive increase in the black and gray market for pharmaceutical drugs and other medical instruments. These studies also pointed out the severity and the upmost criticalness of some of these counterfeited items. Having found that the issue mostly resides in the supply chain management and the importation of these items, the research community has taken action into developing an efficient and effective system to tackle the traceability of the pharmaceutical and medical items, as well as the accountability of the workforce in the pharmaceutical supply chain network. With blockchain technology promising the "holy grail" for the supply chain management systems, this project proposes a unique two-layered traceability system using the blockchain technology. Providing traceability in both the freight or container level, and the product level according to the criticalness of the items being shipped and transported. Also, the nature of the blockchain will provide a trust mechanism in an untrusted network such as the supply chain network, the information stored in the decentralized distributed ledger will be immutable and will hold a level of accountability and trustworthiness

Graduation Projects of the Academic year 2019-2020

No		
		
5	**Project Title**	**SMART Cap**
	Students' Name	Refal Essam Abdrabou Mohamed Mustafa
	Supervised by	Dr Ahmed Ayoub
	Abstract	Currently about 10% of the world's population, or nearly 650 million people, live with a disability. People with disabilities, especially limb disability, have difficulty dealing with their life needs without the help of others. So, they are in dire need of innovations that make life easier. Quadriplegia patients that suffer from limb paralysis face everyday difficulty in accomplishing their basic daily needs leading them to be in a constant need for another person's aid. They are pushed away from the outside world with their inability to interact with people through social media applications on the mobiles and the rising advanced technology and electronic devices present at 90% of the households nowadays such as mobiles, laptops, Smart Televisions, microwaves and even door intercoms. This usually raises their frustration and depression and negatively affects their mental health state as they are locked inside their inabilities to add flavor to their daily lives. We tend to solve that using a smart cap that detects the change of angles of their head movements and accordingly allows them to control electronic devices such as the mobile.

Graduation Projects of the Academic year 2019-2020

No		
		
6	**Project Title**	**SMART energy metering**
	Students' Name	Amro Mahmoud Abdelfatah Taha Deshish - Karim Alaa Mohamed Ahmed
	Supervised by	Dr Samer Ibrahim
	Abstract	Our current electric grid was developed more than a century ago. When electricity needs where simple and power generation was local to communities. Nowadays the demand for electricity exceeds the ability of our systems. To face these problems, technical teams are modifying and updating the already existing grid to make it into a smarter and more adaptive power grid. The Smart Energy Metering system is based on an idea of a grid that resembles a network that connects every consumer, supplier, or power source to a network that has a 2-way communication system. This 2-way dialogue where electricity and information can be exchanged between the utility and its customers. Our project will establish such connection using an Electrical Grid Simulator and using a software, analysis will be performed on the stored data sets, seeking a pattern in order to meet the targeted balance, which the demanded energy is equals to or less than the supplied energy. Thus, decreasing power outages, overheating transmitting lines and an overall more reliable electrical grid

Graduation Projects of the Academic year 2019-2020

No		
		
7	**Project Title**	**3D gesture control for automotive system**
	Students' Name	Mirna Azmy Gerges Azmy Rizk - Mina Magdy Michel Zaki Bolis
	Supervised by	Dr Samer Ibrahim
	Abstract	We have always loved to touch and feel things. We have done so since we controlled the flow of water from the ancient aqueducts. But switches, sliders and buttons are not always the best, most hygienic or easiest way to control your world and with the advancement in technology, the car has become a place for media consumption, a communications center and an interconnected workplace. The number of features in a car 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 be able to control all features of the technology. This means in order to be efficient in validation of an infotainment product more and more automation is required thus Creating an automatic test solution for one of Valeo's innovation Projects "3D Gesture User Interface" is required through the development of a new testing environment that could validate 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. 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

Industrial Systems Engineering (ISE)

Graduation Projects of the Academic year 2019-2020

No		
		
1	**Project Title**	**Waste Elimination in Food Manufacturing Production Line**
	Students' Name	Mohanad Magdy Abdel Maksood (142889), Omar Ali Osman Ali Mohamed (143125)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	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.

No		
		
2	**Project Title**	**Optimizing the Surgical Operating Room Scheduling in a Hospital**
	Students' Name	Yehia Mamoud Mohamed Ismail (151423), Youssef Hossam Ezz-Eldin Malek (151723).
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	Project Objectives: 1- Determining the main factors that affect the surgical delay using a Questionnaire. 2- Devising better scheduling alternatives using Neural Network and Mathematical Modeling techniques. 3- Collection of a real case historical data to help in the training of the artificial neural network to estimate and predict the time of each operation specialty. 4- Validating the suggested hematical model by applying a case study for a selected timeframe. Validation of the model showed that it minimized the number of doctors available for the week from 67 to become 44 after implementation of the optimization model. Overall the model improved that doctor idle time reduced by 34%.

No		
		
3	**Project Title**	**Developing a material Handling System in a Textile Factory**
	Students' Name	Possy Tarek Gaber (136119), Mohammed Saber Mohammed (137687)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	The objective of the study is to design different models of material handling systems to fulfil the project requirement in order 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 room machines to upgrade the mixing and blow room department in the factory. After the designing phase, the best solutions were chosen and implemented. Results 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. After manufacturing and implementation of the new material handling equipment, the workers started training on the new hand cart and the results showed that the productivity of the workers increased by 50% and the idle time was reduced by 30%. on the other hand, the problem regarding the back injuries was eliminated.

No		
		
4	**Project Title**	**Enhancing of Toughness of Carbon Fibers - Epoxy Composites by Rubber Particles**
	Students' Name	Wehib Mohammed Ahmed (095283), Hussain Jasem Al – Qattan (124087)
	Supervised by	Dr. Yasmin Abdin ; Dr. Ahmed Mostafa
	Abstract	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 preforming 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.

Graduation Projects of the Academic year 2019-2020

No		
		
5	**Project Title**	**Design and Manufacturing of Portable 3D Scanner Robotic Arm**
	Students' Name	Ahmed Ibrahim elsaid (152609), Mohamed Magdy Abdallah (120941)
	Supervised by	Dr. Ahmed Badawy
	Abstract	The mechanical 3D scanner is designed and implemented in this graduation project. A contact based serial manipulator with multi-degrees of freedom along with rotational encoder is utilized manually to measure joints angles. The produced CAD model is used in both manufacturing and quality inspection. For manufacturing process, the CAD model is directly feed it to CNC machines. Whereas for quality inspection process, the CAD model is compared to a standard model and the difference between the two models determine quality level of the produced parts. After testing performance and measurement validations of the portable scanning arm it can sum up the accuracy of the portable scanning arm is around 6.5%. It minimized the price of the Portable scanning arm to around 8800 EGP.

No		
		
6	**Project Title**	**Waste Reduction in Refrigerator Factory**
	Students' Name	Hesham Adel Rashed(135297), Mahmoud Abd Ellah Hamed (136417)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	The project objective is 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. 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 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.

Graduation Projects of the Academic year 2019-2020

No		
		
7	**Project Title**	**Waste reduction in glass manufacturing**
	Students' Name	Karim Mahmod Abdelhaq (163327), Mohamed Ahmad Goda Said (160255)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	The AUG Company is working in the field of glass production for different purposes. One of the most important products is the triplex glass which is used for isolating sound in different places such as hospitals, hotels, airports, and other different applications. Elimination of the waste is a topic involved in all types of industry with environmental way and economy respective. After collection of data the total percentage of glass breaks in the production line was10% per month at different areas. The objective of this project is to reduce the total waste in the production line and increase the productivity by using the Lean Six Sigma DMAIC Methodology. After implementing lean six sigma DMAIC Methodology, the waste at production line decreased by 7% of total waste and the productivity increased by 49.67%. Target plan is applied with 90% efficiency through reorganization of the plan of cutting machine, and the sequence of the orders at the oven station. Also, a new department for manual cutting was developed for the urgent customer requests and the orders which break inside the oven, to satisfy the daily target plan.

No		
		
8	**Project Title**	**Implementation of a Production Plan and customizing ERP system at Outdoor Furniture Factory**
	Students' Name	Maged Mohamed Mohamed (153489), Mina Adel Samir (152511)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	Egyptian Metal & Wood Industries Group is a company specialized in furniture manufacturing. The company was established in 1986. The factory located in the 6th of October industrial zone is specialized in manufacturing of outdoor furniture, home furniture, hotel furniture, aluminum windows & door hardware (fittings). The company recently launched a new brand called ACAJIA for outdoor wooden furniture to expand its market share and to benefit the diversity of the products within similar raw materials. Our objectives are to replace the absence of a production plan and the lack of communication between departments by constructing and implementing a proper production planning system through developing a forecasting model suitable for the company for the year 2020, figuring an Aggregate Plan for the company, planning a Material Requirement Plan (MRP) for the company in 2020 along with developing and training the employees to use the developed system efficiently.

No		
		
9	**Project Title**	**Process Improvement for Poultry Feed Mill**
	Students' Name	Mahmoud Mohamed Shaban (164685), Muhamed Mokhtar Radwan (160685)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	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 is improving production rates while maintaining quality specifications of the poultry feed factory final products. The improvement approach is 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 is 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.

No		
		
10	**Project Title**	**Improvement of Dies Exchange Operation**
	Students' Name	Yehia Mohamed Yousef (153525), Ali Mohamed Mohab Ali(152837)
	Supervised by	Prof.Dr. Nahed Sobhi , Dr. Sameh Salah
	Abstract	Single minute exchange of die (SMED) has become one of the most important and common implemented techniques that are used for dies changeover and installation time reduction. In this project, a problem to be faced which is the long setup time of dies in eleven huge presses used in sheet metal forming, located in Egypt for Engineering Industries Factory (EEI), which leads to low capacity of production, time and money losses. Engineering wise, time losses are directly translated into wastage of money and that could be the most essential problem to be solved or to be focused on, in any kind of organization or manufactory. SMED methodology has been implemented on this project so that effectiveness of the technique could be measured. After implementing the solutions, the overall installation time of dies has been reduced by 50% and it is aimed to reduce this percentage more and more after recommendations are done. Any percentage of dies changeover time could be saved is going directly to be translated into money saved and capacity of production increased as a result of dies changeover time reduction.

No		
11	**Project Title**	**Enhancement of Poultry Feed Product Homogeneity**
	Students' Name	Abdelatief Nasr Abdelatief (164291), Basel Ehab Mahmoud (160663)
	Supervised by	Dr. Mohamed Hassan
	Abstract	WADI Company is formed of group of different factories dealing with agriculture business industries since 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 is 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. 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.

No		
12	**Project Title**	**Design and Manufacturing a Prototype Machine for Production of 3D Printing Filaments Using Recycled Plastics**
	Students' Name	Mohammed Sabri Mohamed (154337), Wesam Ahmed Akawy (161515)
	Supervised by	Dr. Mohamed Hassan
	Abstract	This project aims to designing and manufacturing a prototype machine that 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 hoper. The process consists of two main stages, the first stage is melting of the pellets by heating at specified temperature and then the molt will be extruded through a die which has the shape of the required filament size. The second stage is 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. Tensile test samples are 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.

No		
13	**Project Title**	**Investigation of Slurry Erosion Behavior of FDRS and Nano Composite Materials**
	Students' Name	Wagih Abdel-Gawad Shokry (155433), Walid Mohamed Rashed (164211).
	Supervised by	Dr. Yasmin Abdin
	Abstract	Slurry erosion is a severe problem as it leads to considerable expense caused by failures, downtime, and material replacement costs. These problems are observed in fluid machineries and fluid transportations, especially in pipelines applications such as oil and gas industry, industrial drainage, water transportation, petrol pipelines, etc. Slurry erosion is dependent on several parameters such as slurry properties, service conditions, and material properties. The present work is undertaken to study the development, characterization and erosion wear performance of polyester resin reinforced with E-glass woven fiber. Focus will be on glass fiber reinforcements as the major type of fiber materials due to cost efficiency and high mechanical properties. Parameters used in the investigation: Using silica sand of 500 µm as erodent, velocities of 10.94, 13.02, 15.45, 17.01, 18.4, 18.75, 20.66, and 23.43, and angles of 15, 30, 45, 60, 75 and 90 at constant test duration of 1.5 hours. And Erosion test was performed in each parameter with repetition factor equals 3. The results are analyzed using design of experiment approach and applying Taguchi method and ANOVA to find the best processing conductions that leads to minimum losses to the test samples using Minitab 19.

No		
		
14	**Project Title**	**Design and Manufacturing of an Automatic Machine For Producing Carbon Nanotubes**
	Students' Name	Mohammed Abdullah Mohamed (137035), Mariam Magdy Mohamed (154417)
	Supervised by	Dr.Mostafa Zaki , Dr. Moh. Abdelmottaleb
	Abstract	The production and industrial applications of Carbon Nanotubes (CNTs) are recently the main concern of research in nanotechnology. The unique nature of carbon combines with the molecular perfection of single-wall CNTs to endow them with extraordinary material properties, such as very high thermal and electrical conductivity, stiffness, strength, and toughness. It is the only element in the periodic table which bonds to itself in an extended network with the strength of the carbon-carbon bond. The delocalized pi-electron donated by each atom is free to move about the whole structure, instead of remaining with its donor atom, resulting in the first known molecule with metallic-type electrical conductivity. Moreover, an intrinsic thermal conductivity higher than even diamond is offered by the high-frequency carbon-carbon bond vibrations. The main goal of this project is to develop a complete design of an Arc Discharge (AD) machine for producing carbon nanotubes (CNT's) by using deionized water and extra pure graphite multiple electrodes 99.9% pure. The advantage of this design is to increase yield of CNTs within the experimental limitations, through the increase of the number of cathodes and anodes and by using an automatic feeding system for the electrodes, resulting in lower cost production.

Architecture Systems Engineering (ASE)

Graduation Projects of the Academic year 2019-2020

No		
		
1	**Project Title**	**Peoples Republic of China's Embassy-New Administrative Capital**
	Students' Name	Ahmed Abd-Aziz Matouk Hassanein
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy
	Abstract	The challenge in designing an embassy in a foreign country is whether to respect the prevalent style of buildings in the host country, in this case Egypt, or to portray an image representative of the home country, in this case China. The Embassy complex includes the Consulate section, the Embassy itself and the Ambassador's residence. The design calls for the latter to have a separate secured entrance and access for the ambassador to and from his office in the Embassy. The Consulate section contains the visa processing area with sufficient seating and counter space. The embassy itself consists of the Chancery housing offices for the administration of the embassy and the ambassador's office, a library, conference hall, reception area with formal dining hall and kitchen.

No		
		
2	**Project Title**	**Kingdom of Saudi Arabia's Embassy- New Administrative Capital**
	Students' Name	Ahmed Mustafa Alsayed Morsy
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy
	Abstract	Our design of the Kingdom of Saudi Arabia Embassy in the diplomatic area of the New Capital took into account the cultural and traditional influences of the Saudi Arabian society on the choice of circulation flow, and the human activity needs within the complex. As for the challenge posed by designing an Embassy in a foreign country and whether to adhere to a style reminiscent of the home country, in this case Saudi Arabia, or a style in accordance to the host country, Egypt we didn't see a great difference between both given the similar climatic conditions, use of similar building materials such as sandstone, small openings in response to the harsh arid atmosphere. Our individual designs reflected this common approach.

No		
		
3	**Project Title**	**United Kingdom's Embassy- New Administrative Capital**
	Students' Name	Abdallah Nabil Amen Saied Mohamed Esawi
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Rasha Sayed
	Abstract	The Embassy complex of the UK in the New Administrative Capital is comprised of the Consulate section, the Embassy and the Ambassador's residence. The program calls for the residence to have a separate secured entrance as well as an access for the ambassador to and from his office in the Embassy. The Consulate section contains the visa processing area with sufficient seating and counter space. The Embassy itself consists of the chancery which is an office building housing offices for the administration of the embassy adjacent to the ambassador's office and close to the conference areas and most public functions. It is a place of business, education, entertainment, and socialization representing the country of origin, the UK. In response to the challenge of designing the embassy of the UK in Egypt, we chose to individually design the building in a postmodern style representative of the home country, the UK using modern building materials and in response to the context and the prevailing weather conditions.

No		
		
4	**Project Title**	**United States of America's Embassy- New Administrative Capital**
	Students' Name	Mohamed Elsayed Mohamed Mohamed Borei
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Rasha Sayed
	Abstract	Because of the spread of terrorism worldwide at an alarming rate from the mid-1980's onwards, the State Department formed a commission to study security upgrades to US Embassies. Results of the 1985 Commission call for security of the complex as well as a welcoming atmosphere. This formed the challenge for our design of the US Embassy in Egypt: following the security guidelines of the State Department and creating a friendly and warm ambience. For security reasons and in accordance to the commission's recommendations, openings for windows in public spaces were kept to a minimum. Additionally, a setback to allow for multiple barriers of penetration for added security was maintained. The lobby/reception area is a critical point of contact, not only diplomatically, but for obvious reasons of security. It is designed to set the tone for the building and the public face that is being projected by the country, the USA. The challenge we faced in designing the embassy was whether to respect the style of buildings in the host country, Egypt and in particular those of the New Capital, or an image representative of the home country, the USA. In our individual designs, we tried to integrate the embassy into the urban fabric of the New Capital and in response to environmental concerns choosing sustainable building materials for its construction.

No		
		
5	**Project Title**	**Germany's Embassy- New Administrative Capital**
	Students' Name	Ahmed Alaa Ali-Allah Ahmed
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Rasha Sayed
	Abstract	In designing the embassy of Germany in the New Administrative Capital, we were faced with the challenge of designing a sustainable building with thick walls and limited openings for reasons of security. This meant that the large expanses of glass we tend to include in our facades would be replaced by smaller and secured window openings. As for the style we individually chose for the embassy of Germany in Egypt, we agreed to design the building in a style representative of the home country, Germany. The Embassy complex includes the Consulate section, the Embassy itself and the Ambassador's residence. The design calls for the latter to have a separate secured entrance and access for the ambassador to and from his office in the Embassy. The Consulate section contains the visa processing area with sufficient seating and counter space. The ambassador's office is designed to be large enough to accommodate meetings and differing tasks performed for diplomatic, social, and economic relations, entertainment and high-level meetings with dignitaries from the host country, Egypt and home country, Germany.

No		
		
6	**Project Title**	**Italy's Embassy- New Administrative Capital**
	Students' Name	Dalia Ayman Abouelfetoh Ali Rashwan
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Doaa Esmat
	Abstract	In response to the challenge of designing the embassy of the Italian Republic in Egypt, we chose to design the building in a Neo Renaissance style characteristic of the home country, Italy, rather than sticking to a contextual style representative of Egypt whether that be contemporary Islamic, Coptic or Ancient Egyptian. The building program of the complex called for designing the Embassy proper, Consulate, and the ambassador's residence in the plots assigned to the various embassies of the countries with diplomatic relationships with Egypt. Those plots are located within the diplomatic quarter of the New Administrative Capital. Separate secured entrances to all three sections were required. In our individual designs, we tried to make entrance to the ambassador's residence from a side or a back road, while those for the chancery and consulate from the front. Security measures for those entrances is paramount.

Graduation Projects of the Academic year 2019-2020

No		
7	**Project Title**	**Republic of South Africa's Embassy- New Administrative Capital**
	Students' Name	Ahmed Tarek Ahmed Abdou El-Metwaly Omran
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Doaa Esmat
	Abstract	In the design of an embassy, access, view, and fenestration are major design considerations for reasons of security. The design challenge would, therefore, be to produce a secure, welcoming contemporary building without giving the impression of fortification. The second challenge concerns the style of the building. In designing an embassy in a foreign country, the question posed is whether to respect the prevalent style of buildings in the host country, or to portray an image representative of the home country. In our quest to answer this question, we tried to find a representative style of buildings in the Republic of South Africa, but couldn't. The International Style prevails in the city centers of Cape Town, Pretoria, and Johannesburg. While vernacular buildings with thatched roofs are to be found in the poorer neighborhoods. Accordingly, our individual designs follow different approaches.

No		
8	**Project Title**	**Rosetta Heritage Complex- Rosetta**
	Students' Name	Ahmed Gamal
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy, Rasha Sayed
	Abstract	The city of Rosetta is full of monuments, tradition and culture and is rich with its history through the ages. It is considered only second to Cairo in Islamic monuments which gave it a strong identity. But this identity was weakened by negligence, deterioration and lack of maintenance causing its luster to fade away with the passage of time. Despite Rosetta's historical and geographical value, tourism in general whether local or foreign is very poor and does not contribute to the city's economy. The proposed project, Rosetta Heritage Complex, will be dealing with the problem of monument deterioration by restoring monuments and displaying them in a presentable way. In the complex, visitors will be able to explore Rosetta's heritage in an interesting way experiencing its history in an interactive manner through communal spaces and galleries.

No		
		
9	**Project Title**	**Luxor of the North Museum- San El Haggar, Sharqia Governorate**
	Students' Name	Ahmed Mostafa Mahmoud Mohmed Badr
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy, Rasha Sayed
	Abstract	San El Hagar, also known by its ancient Greek name Tanis, is the most important archaeological site in Egypt's northern Delta comparable only to the city of Luxor in the South. It is said that San El Hagar, Sharqia, contains one third of Egypt's artifacts. Contrary, however, to Luxor in Upper Egypt, San El Hagar is hardly known as a touristic attraction whether locally or internationally. The reason being the state of disarray the site is in. Today the site is full of inscribed and decorated blocks, columns, obelisks and statues mostly amongst large mounds of ruined temple blocks and debris. The temple precinct lies in the middle of these mounds containing the ruins of the temple of Amun. In order to give San El Hagar the importance that it deserves and put it on the touristic map of the world, we propose building a museum with an archeological research center whose main concern is to excavate, restore and document the thousands of artifacts littering the site. The museum would house the restored statues and obelisks, while the ruined temples would be archeologically restored to be part of the open museum being developed by the antiquities' authority.

No		
		
10	**Project Title**	**Tal Basta New Paradigm- Tal Basta, Sharqia Governorate**
	Students' Name	Abdelrahman Osama
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy, Rasha Sayed
	Abstract	Tall Basta, Zagazig- Sharqia Governorate possess one third of Ancient Egyptian monuments and yet is not a touristic attraction as are Luxor, Edfu and Aswan in Upper Egypt. One of the main reasons for that is the inferior condition of the monuments lying scattered on the ground, and the neglect by which the antiquities authorities treat them as opposed to those in the regions of the south. Tall-Basta has a small museum with a few monuments on display in the midst of the hundreds of dilapidated columns, bases, and obelisks surrounding it. Yet no effort to excavate, protect and preserve the existing. The main objective of the proposed Archeological Center is to do just that: excavate, collect, protect, preserve and research the historical monuments. Its aim is to save the neglected monuments and to put Tell-Basta on the touristic map of the world.

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No		
		
11	**Project Title**	**Wood Recycling- Damietta**
	Students' Name	Ahmed Shabaan
	Supervised by	Drs. Omar Fawzy, Sameh El Feky, Rania El Messeidy, Rasha Sayed
	Abstract	Damietta in lower Egypt is the most famous city for producing furniture in both classic and modern styles. However, in recent years Damietta began to lose its foothold in the furniture market in Egypt to imported simple furniture mainly from the far east. The fierce competition with imported furniture coupled with the deteriorating economic situation in Damietta led to the migration of skilled craftsmen to Arab countries and hence to a drop in the quality of furniture. Our suggested project, the R & R Furniture Academy- where the R & R stand for recycling and reusing- has as its aim educating new furniture production techniques to a new generation of craftsmen instead of the old traditional apprenticeship technique where the craft is inherited by son from father. It will as well teach furniture design for a new generation of furniture designers. Additionally, it will promote the idea of recycling through raising awareness of the benefits to the environment and the economy of recycling the waste (saw dust and discarded pieces), and reusing of old furniture transforming them into refurbished furniture. It is expected that the furniture academy will restore the reputation of Damietta as the main furniture manufacturer through the production of high-quality furniture that could compete with imported furniture while saving the environment through its recycling program.

No		
		
12	**Project Title**	**Furniture Exhibition Center- Damietta**
	Students' Name	Abdallah Hamza Sayed
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	The city of Damietta is well known for its furniture industry. However, in recent years the competition with imported furniture led to a decline in sales of Damietta's hand-crafted furniture in favor of imported industrialized furniture. Some of the traditional wood workshops had to close, with craftsmen migrating to neighboring cities or the capital Cairo, others changing their vocation. Although the planned Furniture City in New Damietta is a promising mega project that will transform the furniture industry from a craft into an industry that depends on modern technology, we see it as the last nail in the coffin of the handcrafted furniture that Damietta had been famous for. In order to revive the craft within the city, we propose building a Furniture Exhibition center in the old Damietta that will display the furniture of all workshops in local and international showrooms. It will include shops to display and sell machines used in the production process, fabric stores used in the furniture manufacturing process, shops to display and sell accessories needed for the industry, areas dedicated to shipping and dispatch companies, loading docks for shipping products worldwide.

No		
		
13	**Project Title**	**Educational Centre for Boat Manufacturing- Rosetta, Beheira Governorate**
	Students' Name	Ahmed Moataz Abdelhamid El Sayed
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	Rosetta is well known for fishing, boats and ship industry. However, due to the economic recession and the seeming neglect by authorities, a lot of its historical monuments are in need of restoration. Even its boat industry is suffering from a shortage of workshops, and is in need of professional supervision for the existing ones. Those engaged in boat manufacturing are still using archaic methods and materials which are time- and energy-consuming. Our suggested project, an Educational Centre for Boat Manufacturing, would be an ideal solution to the above problem through its intended function: the introduction of modern techniques of boat and ship building to the local boat builders. This would place Rosetta back as a boat manufacturing hub given its geographic position on the River Nile, and a ship building itinerary given its location on the Mediterranean Sea.

No		
		
14	**Project Title**	Fishery Service Institute- Bohairt Elmanzala, Daqahlia Governorate
	Students' Name	Amr Abd Elhadi Mohamed Abd Elhaleem
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	The main objective of our suggested project, Fishery Service Institute, is to improve the living conditions of the residents of the fishing village of Al Matarya in the governorate of Dakahlia, Delta Region. Historically, Al Matarya has been famous for the manufacture of boats and fishing nets. However, due to the continual deterioration of Bohayret Al Manzala, residents of Matarya have been suffering from health, economic and social problems. Throughout history, residents of Matarya depended for their livelihood on fishing, boat and net manufacturing. The goal of the Fishery Service Institute is therefore to revive both industries, solve the problems associated with the deterioration of Al Manzala lake, improve the economic situation and achieve a better environment and comfort for its residents

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No		
		
15	**Project Title**	**The Paradox of Papyrus- Toukh Qaramous, Sharqia Governorate**
	Students' Name	Aya Khaled Mohamed Mohamed Abdel Daiem
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	The project aims to revive the interest in growing the papyrus plant given its numerous benefits, notable among which its use as a low-cost approach for water purification. In accordance with the Egyptian government's directive and aim to deliver pure water to every Egyptian house in both large cities and poor villages, the Papyrus Research Center will contribute to the initiative of living in eco-friendly environments through its research of the papyrus plant, and raising awareness about its importance. The village of Qaramous in Sharqia governorate is well known for cultivating papyrus. Its inhabitants consider the papyrus industry as their main source of their income. Lately, however, cultivating papyrus has been neglected, with swamps replacing the clear river water. The main aim of the research center, therefore, is to revive the interest in cultivating the papyrus plant and promoting a new solution by offering a low-cost filter system that works on purifying water with an environmentally friendly approach.

No		
		
16	**Project Title**	**Wetland & Aquatic Research Center- Bohairt Al-Borollos - Sharqia Governorate**
	Students' Name	Abdelrahman Sayed Mohamed Mahmoud Hassan El-Beheiry
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	In terms of area, Burullus Lake is the second largest natural lake in Egypt. It is situated in the north of the Nile Delta region with a narrow sandbar separating it from the Mediterranean Sea. The lake is shallow and has a number of environmental features, including salt swamps and sand plains. It is full of reeds especially near the south where reed swamps and underwater variety of aquatic vegetation border the southern shore. The lake is a home to over 135 species of plants both of the land and aquatic variety. The lake is an important wetland for waterfowl and migrating birds. Before the construction of the Aswan High Dam, the lake received the Nile floods in the end of summer and fall. After its construction, the lake's ecological balance has been affected. Moreover, prior to the 1952 Revolution, the area surrounding Lake Burullus was sparsely populated. However, the land reform act of 1953 changed that affecting the ecological environment in and around the lake. Since 1953, one sixth of the area close to the lake has been given to the land reform scheme which is now densely populated. Our proposed project is a wetland and aquatic research center whose aim is to restore the ecological balance of the lake. Scientists and researchers are expected to collect samples from the lake and test them in their various labs: Extraction labs, Quality control labs, water quality labs, organic pollutants labs, and gases extraction labs. Recommendations based on the tests would be used to counterbalance the negative effects on the ecology by the fish farms and reed swamps.

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No		
17	**Project Title**	**Research Centre for Rice Straw Recycling- Mansoura, Daqahlia Governorate**
	Students' Name	Ahmed Farouk
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	Climate change is one of the major problems facing Egypt. In addition to the considerable loss of agricultural land, and rising temperatures, one of the main reasons for this change is the black cloud that has been polluting Cairo's atmosphere for years. There are many causes of this phenomenon including the manufacturing of cement, car exhaust, and agricultural waste burning, and in particular rice straw burning. According to a report by the Ministry of Agriculture in 2009, rice straw burning constitutes 43% of the black cloud in Egypt. Faced with the rice straw waste on their land after cultivating the rice crop, farmers would burn the waste creating the black cloud that used to affect all the Delta region with the smoke reaching Cairo and its suburbs. For years this has been the case despite the government's effort to curb this phenomenon through high fines on perpetrators. Our proposed Research Center's main goal is to find ways of transforming agriculture waste to sustainable useful products thus helping in preserving Al Dakahlia's environment, and preventing air pollution from reaching neighboring governorates and the capital. Through the research in different directions, recycling of the waste could take the form of fertilizers, animal food, or the construction field products such as using rice straw in construction materials, bricks, etc. thus replacing the agricultural waste to useful and environmentally friendly products.

No		
18	**Project Title**	**Furniture Expo City- New City of Damietta, Damietta Governorate**
	Students' Name	Hanin Mohamed Farid Mahmoud Elzomor
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	The city of Damietta is well known throughout Egypt for its manufacture of solid wood furniture. Egyptians, especially families of brides to be, used to flock to Damietta from all over the country ordering bedroom and living room furniture for the soon to be married couples. Lately, however, with the importing of inexpensive furniture from the far east made of processed or laminated wood, and the introduction of the Swedish furniture store IKEA in Egypt, the importance of Damietta as the main producer of furniture in Egypt has dwindled. In its vision for an extension to the cramped conditions in Damietta, the government built the city of New Damietta. New Damietta thus became the new center of the furniture industry attracting skilled craftsmen from the old city of Damietta. However, in recent years New Damietta is having serious problems in exporting its furniture. This is partly due to the reason mentioned above, and in part due to the adoption of poor marketing strategies by the city's furniture manufacturers. Our proposed project, Furniture Expo City, aims to solve that problem through providing a venue for displaying new furniture as well as furniture that has not been exported and would've gone to waste. The unique location of New Damietta on the Mediterranean Sea will help in attracting investors, sponsors and tourists to the city. Through the furniture expo project, we expect that New Damietta will regain its position as a leading furniture manufacturer, thus preserving its identity and heritage, reducing unemployment, and improving the city economically.

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No		
		
19	**Project Title**	**Arts and Crafts Center- Sakkiet el Mankadi, Ashmoun-Menouffia Governorate**
	Students' Name	Ahmed Alsayed Shehata Alsayed Ahmed
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Rania El Messeidy, Rasha Sayed
	Abstract	Menoufia governorate is located in the Nile Delta north of Cairo and south of Gharbia governorate. Apart from agriculture which is the main source of revenue, it is known for handicrafts in its villages ranging from handmade carpets, kilims and silk carpet industry, textiles, to pottery and porcelain, pearl and sea shell industry, Islamic artifacts, chandeliers, arabesque, jerid (wicker) and bamboo industry. More than 11 such handicrafts each in a different village in Menoufia. Ashmoun, Menoufia is one of the administrative centers of Menoufia. It is a city of great history that dates back to Ancient Egypt where its name is derived from "Ash Amun" or Amun's House. Sakkiet el Mankadi is one of the small villages in Ashmoun. It is well known for its sea shell industry. The workshops are attached to the rural homes or in the fields of Mankadi. The residents have perfected the designs of wooden boxes inlaid with geometric chippings of sea shell which are exported to the shops in Khan El Khalily, Cairo to be sold to tourists. Other than boxes, Backgammon boards, trays, trestles, screens, and inlaid pots are produced by artisans in the village. Problems of marketing, middlemen, and raw materials make this industry suffer. Our proposed project, an Arts and Crafts center in Mankadi would provide a venue for exhibiting their handmade products, workshops all under one roof instead of several in the homes, teaching the trade to younger residents of the village in classrooms, and a sales office to sell the products eliminating the need for middlemen.

No		
		
20	**Project Title**	**Rosetta Exploratorium of Narratives- Rosetta, Beheira Governorate**
	Students' Name	Ahmed Mohamed Abd El Hamid Mohamed Abd El Rahman
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	The proposed project is an Exploratorium of Narratives. This project will shed the light upon Rosetta's neglected heritage by creating a path through the city that starts and ends at the Exploratorium. The project will act as a center of enlightenment, where visitors will be able to view and explore the city's most important monuments and its historical background and importance, which is part of the narrative told. The Exploratorium is going to include an interactive exhibition showing simulations of Rosetta's important heritage monuments and telling its story throughout time. Visitors will have the opportunity to explore the past, which will make them understand Rosetta's value. The narrative told in the Exploratorium will be the story of Rosetta's history and the different eras it has been through, and how these changes shaped the city's identity. This will help increase the visitors' awareness and encourage them to help maintain the monuments. The project will include a documentation center that will document the important data required to restore and preserve Rosetta's rich heritage and identity. There will also be workshops and seminar classrooms that allow the message to be transferred to the people of Rosetta, raising awareness, and showing them their identity. The project aims to make the world understand the value of Rosetta and highlight its glorious past, possibly leading to its declaration as a world heritage site.

No		
		
21	**Project Title**	**Business Trade Centre- Al Senanyah, Damietta Governorate**
	Students' Name	Abdelrahman Ahmed Saaed Mohamed
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	Al Senanyah in the governorate of Damietta is facing many problems which led to losing its position as one of the leading furniture manufacturing towns in Egypt. The economic recession and the rise in unemployment added to the migration of skilled craftsmen contributed to this dire situation. Our mission, therefore, through our proposed project, Al Senanyah Industrial Trade Center, is to revive handmade furniture and its trade, thus restoring the town's identity as a leading woodworking and furniture manufacturer. The trade center will be mainly dealing with the marketing problems facing the furniture trade in Al Senanyah as well as the economic industrial problems both in one venue. It will facilitate the process of trade thus increasing the sale of handmade furniture while creating job opportunities. It is expected that with the revival of the furniture trade market through increased and better productivity, a sense of pride in their trade will lead to a sense of belonging, and hence a halt to the migration of the resident craftsmen.

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No		
		
22	**Project Title**	**Aroma Development Hub- Shobra Baloula, Qotour, Al Gharbia Governorate**
	Students' Name	Ingy Adel Mohamed Metwaly Khalifa
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	Our proposed project, Aroma Development Hub, aims to create a Hub that promotes research and training in the aromatics field in the village of Shobra Baloula, Al-Gharbia Governorate. The reason for choosing the location is that Shobra Baloula has the highest rate of growing the Jasmine flower reaching up to 10 tons a day causing this area alone to yield 50% of the world's production of this flower. Farmers convert the jasmine flower into a putty that is exported as raw material to foreign fragrance companies at a low price, only for the consumer market in Egypt to buy it back as perfume products with double and triple the prices. So why not develop the techniques and information to go further than just making the putty and actually exporting other forms of jasmine extracts with higher quality, and for more money, thus breaking the monopoly of external investor's control over the livelihood of the local growers of the jasmine plant? The situation as it stands is dependent on supply and demand by external parties. If no orders are received from the foreign investors, then the local market suffers. In addition, the demand fluctuates leaving a huge number of jasmine flowers on trees which turns into a wasted resource. The Aroma Development Hub's objective, therefore, is to enhance the crop's quality through finding ways of developing the jasmine flower, discovering other forms of extraction through research and hence, exporting it in various forms other than only the putty, and for better prices.

No		
		
23	**Project Title**	**Equestrian Complex- Belbes, Sharqia Governorate**
	Students' Name	Abanob Mamdouh
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Tarek Abdelsalam, Hasnaa El Sherbeiny
	Abstract	The Belbeis Center is characterized by the existence of an annual festival of Arabian horses attended by a group of foreign visitors and Arabs interested in attending the festivals of horses in the world as the governorate of Sharqiya is unique for its finest and most expensive varieties of Arab horses in the world. The proposed equestrian complex will fulfill all the standards and essential requirements for both humans and horses in the equine sport. It will provide the facilities that efficiently supply the place with all functions needed to achieve a comfortable and stable atmosphere for the sport and it will contain different spaces such as: arenas, platforms, barns, food court, shops, boutique, gates, parking, plaza, administration building, medical facilities, entertainment elements, cultural elements, media elements, utility areas, and security points.

Graduation Projects of the Academic year 2019-2020

No		
24	**Project Title**	**The Nile Simulator- Rosetta, Beheira Governorate**
	Students' Name	Fadey Isaac Lamey Khalil
	Supervised by	Drs. Omar Fawzy, Sameh El Feki, Namir Heikal, Shady Shawky
	Abstract	The Nile Simulator is a narrative architecture building acting as a virtual reality experience providing the visitor with a journey through the Egyptian Civilization as it relates to the Nile River. The main objective of the project is to enhance the importance of Rosetta as a touristic city, add a source of income thus increasing the economy through tourism whether local or foreign, and increasing the awareness of its inhabitants of the historical importance of the city. A simulator is different from a museum in the fact that it acts as a virtual reality device taking the visitors on a journey through history of ancient life in Egypt along the River Nile. The project will raise awareness of the importance of Rosetta, its history, and its richness through its monuments in an entertaining and educational interactive manner.