

Faculty of Engineering

Graduation Projects


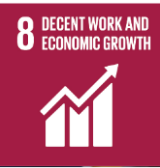
Aligned to SDGs



Year 2021-2022



Computer Systems Engineering (CSE)

CSE grade I project – Spring 2022

No				
1	Project Title	On and Off-Page Search Engine Optimization		
	Students' Names	184803	George Andreas George Petrou	
		163723	Omar Salah Mostafa Sayed Mustafa Oweiss	
	Supervised by	Dr. Ahmed Ayoub		
Abstract	<p>A website with high quality content isn't getting the recognition it deserves due to the algorithms of search engines. In this project, on-page, off-page, and technical search engine optimization (SEO) techniques will be implemented to increase overall traffic to the website and make it appear high on Google's and other search engines' SERP (search engine results page).</p> <p>Several on and off-page along with technical search engine optimization techniques will be implemented with the goal of increasing a website's traffic and making it rank high for many keywords in several search engines' organic results. This will help the owner of the website receive more clients and therefore grow their business. The techniques used should have far more effective and long term results than any online SEO tools or online advertisements.</p> <p>The proposed system of search engine optimization includes complete website analysis, competitor comparison, on-page optimization, off-page optimization, the less common technical optimization, and SERP reporting.</p> <p>Website analysis tools such as Google Analytics and Google's Search Console will be used for website analysis; while HTML, CSS, and Javascript will be used for several on-page optimization procedures. Several social media platforms will be used for page promoting.</p>			
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2	Project Title	P2P Delivery Management System		
	Students' Name	155521	Gerges Abd-Elmalak Shokry Abdallah	
	Supervised by	Dr. Ahmed Ayoub		
	Abstract	<p>Sending packages using dedicated services tied to large online retailers is becoming increasingly inefficient as it takes anywhere from two days to a week to deliver the package and customers have to pay premiums for same-day shipping. A lot of deliveries are dependent on one network tied to one online retailer and introducing this one point of failure means a lot of packages arriving misplaced with another package, broken or not arriving at all, at least not within the appointed time frame. Also, people have a lot of items they no longer need that can be sold and delivered instead of sitting on shelves collecting dust, but the high cost of dedicated delivery services makes the idea economically infeasible. This paper presents a system which uses cargo space that would otherwise be empty to deliver packages on trips that operators will make regardless of whether or not there's something to be delivered. An operator can take a package on his predetermined trip from one location to another, put it in car space that would otherwise be empty, reducing the number of vehicles on the road dedicated to deliveries and thus also reducing carbon emissions. The system will use a web application to store, track and manage payments of deliveries, using different web technology stacks and using Visual Studio Code as an IDE during development. The system will help ease traffic congestion, make some deliveries economically feasible that would otherwise not be.</p>		
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3	Project Title	Road Lane Line Detection for Autonomous Driving Using Computer Vision	
	Students' Names	172729	Noureldin Bahaaeldin Mohamed Fahmy Behary
		162821	Amr Ayman Mohamed Rashad Ahmed Ibrahim
	Supervised by	Dr. Manal Mostafa	
	Abstract	<p>Driver support system is one of the most important features of the modern vehicles to ensure driver safety and decrease vehicle accident on roads. Apparently, the road lane detection or road boundaries detection is the complex and most challenging task. It includes the localization of the road and the determination of the relative position between vehicle and road. A vision system using on-board camera looking outwards from the windshield is presented in this project.</p> <p>The system acquires the front view using a camera mounted on the vehicle that detects the lanes by applying few processes. The lanes are extracted using Hough transform through a pair of hyperbolas which are fitted to the edges of the lanes. The proposed lane detection system can be applied on both painted and unpainted roads as well as curved and straight road in different weather conditions. The proposed system does not require any extra information such as lane width, time to lane crossing and offset between the center of the lanes. In addition, camera calibration and coordinate transformation are also not required. The system was investigated under various situations of changing illumination, and shadows effects in various road types without speed limits. The system will lead to a robust performance for detecting the road lanes under different conditions.</p>	
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CSE grade II project – Spring 2021



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4	Project Title	AI based lung cancer diagnostics framework
	Students' Names	183725 Elham Mostafa Abdelmoneim Mostafa Elsayed 183235 Zeina Khaled Mohamed Kamal Elborai
	Supervised by	Dr Samer Ibrahim
	Abstract	Lung cancer is one of the top causes of death in humans around the world. The primary problem is that only 15% of lung cancer cases are diagnosed in early stages. Early screening can reduce lung cancer mortality by 14 to 20%. Cancer is defined as a group of disorders in which irregular cells divide uncontrollably and infect neighboring tissues and therefore lung cancer must be detected early to reduce the worldwide death rate's impact. The main aim is to make a simple system to make it easier for the patient to get faster and accurate early detection. First, the patient can fill a symptom form as input for a Machine Learning (ML) to detect if a CT scan is needed. Machine Learning (ML) also uses blood work results to predict lung cancer to be certain first that a CT is needed, and this will support results of the deep learning model. Since lung cancer is recognized when the disease has progressed, it is vital to anticipate the disease by using any medical imaging technology when getting early symptoms. By collecting different datasets and pre-processing them this will improve and support the accuracy of the model. The purpose of this project is to create an algorithm for automatically classifying early lung cancer and to detect nodules on CT images using deep learning and computer vision. As a result, the proposed solution will be 2 paths. The first is a 2D Convolution neural network for classifying lung cancer whether malignant or benign, our goal is to try to increase accuracy compared to other systems. The second is a 3D convolution neural network that will be trained to detect Early lung cancer, our goal is to improve the preprocessing to achieve better accuracy than other systems. Also, a U-Net model for segmentation gives confidence for doctors to make sure of the location of cancer and where the model searched.
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5	Project Title	Students Advising System via Machine Learning
	Students' Names	175195 Sherif Essam Ahmed Abdelbaky Abdelbaky
		183811 Omar Mohamed Shebl Abdelgalil Elsayed
	Supervised by	Dr Samer Ibrahim
Abstract	<p>Academic advising is a complex time-consuming process done each semester. In traditional academic advising, academic advisors spend a great deal of time and effort to support numerous students each semester. The proposed system is an automated student advising system that automates the advising process and overcomes the weaknesses and drawbacks of performing the advising process in the traditional and manual way. The system uses artificial intelligence and machine learning algorithms to predict which courses are best to enroll in for a particular student based on multiple criteria such as the student's recent and overall performance. By applying this system, the advising committee will save valuable time.</p>	
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6	Project Title	Anomaly Detection and Flagging using CCTV and neural networks	
	Students' Names	181779	Mohsen Gamal Amin Saleh Alkema
		185067	Muhammad Gamal Abdelaty Moawad
	Supervised by	Dr Samer Ibrahim	
	Abstract	<p>Throughout the last two decades the demand for security and surveillance systems has been exponentially increasing due to the increase of violent incidents. This demand accompanied by the ever-growing advancements in the field of artificial intelligence has led to surveillance systems which are capable of identifying everything from an object moving whether it is humanoid object or not and whether potential threat or not. As a result, this project tackles this problem by developing a full functional surveillance system with the ability to detect threats though abnormality and track them throughout the surrounding area using multiple CCTV cameras by assigning a unique ID to each detected threat, decreasing the time wastage and human error caused by surveillance personnel leading to a more sustainable environment of working by integrating the system to the already existing omnivif system, as the system will be able to classify the type of anomaly while preforming the preprocessing actions required at the back end of the omnivif system making it easier for surveillance personnel to inform the grads in the area of the existing threat. This could be accomplished by developing a deep learning model in the form of YoloV4 to detect if an action is an anomaly or not then, track the specified detected threat using unique ID by integrating the deep-sort model to the deep learning model. This will result in a system with an almost ninety percent higher accuracy, with the ability to track the detected threats in a low enough time delay to be functional in a real time environment, ensuring that the system is a truly reliable assistant for the surveillance monitoring personnel and that such system will track the threats using a unique ID in the surrounding environment making tracking anomalous behavior a much easier job that any person can perform.</p>	
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7	Project Title	Down syndrome data and simulation model	
	Students' Names	184183	Nihal Ahmed Maher Ahmed Fateen
	Supervised by	Dr Samer Ibrahim	
	Abstract	<p>Having a kid with Down syndrome might alter the entire family's lifestyle. Symptoms differ depending on the child's age and from family to family. Recognizing and accepting learning disabilities is a difficult process and requires adaptation by the entire family to promote the optimal development of the child. Recognizing family health issues and changing lifestyles are essential to providing adequate service. Identifying the problem and using the information to plan childcare can be very helpful but it is harder especially when there is not enough awareness or a place that they can go to guide and help them at many different aspects (Health, Education, and Activities). According to this problem. This project designs a mobile application that provides access to parent resources, educator resources, Medical professional resources, as well as events for people with Down syndrome and their families, are available. Also, this application will help parents to read and have more knowledge about the case of their child, they may prevent their child from any health crises. The application is considered as a database collection of all information that will help parents with a Down syndrome child it will also help parents and motivate them to early detect whether or not their fetus has Down syndrome.</p>	
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8	Project Title	Down Syndrome precision system using deep learning	
	Students' Names	185557	Jomana Yousry Hashem Abdelmiguid Zidan
		195421	Mariam Safwat Mahmoud Mohamed Shalaby
	Supervised by	Dr Samer Ibrahim	
Abstract	<p>Down syndrome is one of the most common genetic conditions that occurs when there is an extra copy of chromosome 21. Any genetic condition is always a stress causer to parents and families to their children and even adults who suffer this condition. One of the main causes of lack of ability to deal correctly with mental disorders is that parents do not know prior to delivery that they will be having a child with this condition. Down syndrome has many symptoms and features that can help medical professionals and people identify people with down syndrome. The purpose of this research and project is two-fold: first, to initialize a fully automated medical system that takes sonographic images as input that is conducted during pregnancy to determine whether or not the fetus has Down syndrome by extracting features and by detecting other medical symptoms that are physical in the sonographic images; second, an automated system to detect the class/type of Down syndrome as it has 3 main types where each type plays a very important role in determining whether the next pregnancy will be a Down fetus as well or not, where we have each type explained in details. As previous models of this system have been attempted, our model aims to deliver more accurate, easier to use and faster alternative that we trust will be a great contribution to the medical industry and be a great motivation for parents to conduct sonograms and screening of Down syndrome whether or not it is common in their families in order to be well-prepared if their fetus appears to have Down syndrome.</p>		
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9	Project Title	Intelligent Neonatal Incubator Embedded System	
	Students' Names	183091	Elham Gomaa Abouelfotouh Shabaan
		184025	Hoda Fouad Abdelradi Ahmed Moussa
	Supervised by	Dr. Ahmed Ayoub	
Abstract	<p>NICI (Neonatal intensive care incubator) is one of the most necessary equipment for the preterm baby at the medical field. It is a device that looks like a rigid-box enclosure which the infant is placed and kept in, at a relatively safe environment similar to a mother' womb. An infant need special care because of external environment variance which has an impact on their body regulation. Moreover. Unfortunately, they lack the ability to adjust their body temperature, for this reason the incubator provides a normal range of the temperature, humidity, and gases level inside it. Our proposed system will support regulating the preterm vital rates by implementing and designing a safe, and low-cost control system. Our incubator system maintains the gases level concentration, weight level, indoor temperature, and humidity. The framework of our system is done using Arduino based on the ATmega2560 microcontroller using the Arduino programming language for temperature, humidity control, bulbs, and liquid crystal display. The main essential part is to provide a safety control unit which works on monitoring any error in the system and handling the power flow of the system. Also, the system uses Blynk platform to facilitate for the medical staff to follow up the infant health case.</p>		
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10	Project Title	Detection of Covid-19 Using Deep Learning
	Students' Names	182733 Mahmoud Hossam Mahmoud Aboelmagd Mohamed Elakkad 185863 Mahmoud Mohsen Mahmoud Ali Zanaty
	Supervised by	Dr. Manal Mostafa
	Abstract	<p>The rise of the corona virus (COVID-19) and the way it is spreading made the early identification of the disease a priority task that needs to be accomplished not only to save those who suffer before it is too late but also to avoid its wide spreading. Specialists discovered that the chest medical images provide precious information for detecting the disease. However, manual detection was neither a safe nor accurate method. Moreover, it requires a highly experienced radiologist to examine those images which forced the medical institutes to seek aid from all the possible sources. Due to the rapid development in the computer technology, the shift towards image processing and deep learning (DL) algorithms in the medical field was no surprise. Although several approaches were made to detect patients infected with corona virus by analyzing the computerized tomography (CT) or the chest X-ray (CXR) medical image, their resulting accuracy and sensitivity were never satisfying. Moreover, the lack of datasets at the beginning of the pandemic made it even harder for the developers. However, by the techniques developed from the data augmentation and the usage of convolutional neural network (CNN), some of those limitations came to an end. This research will present different CNN models and their positive effects on the prediction accuracy, sensitivity and confidence to detect COVID-19 from medical images and will end with our proposed CNN model that proved to have a significant impact on early detection of COVID-19 by applying different unique image processing techniques for reducing complexity, enhancing performance and increasing accuracy of the predictions. Eventually, this project will supply the specialists with an easy method that aid their examination and the patients with an easy access to an online COVID-19 detection of the chest x-ray images.</p>
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11	Project Title	Skin Cancer Detection Using Machine Learning	
	Students' Names	183965	Amir Saeed Wahba Morkos
		165555	Mohamed Hamed Abbassy Hassan Hosny Abbassy
	Supervised by	Dr. Ahmed Ayoub	
Abstract	<p>Skin is the biggest organ that covers our bodies. It is the peripheral piece of our body that is in contact with the surrounding environment. As a result, skin diseases appear. One of these diseases is skin cancer. Skin cancer is a dangerous and deadly disease. Skin cancer has about eight categories which are: Actinic Keratosis and Intraepithelial Carcinoma, Basal Cell Carcinoma, Squamous cell carcinoma, Dermatofibroma, Melanoma, Nevus, benign Keratosis Lesion, and Vascular Lesion. Melanoma skin cancer is considered as malignant. Malignant is the dangerous and deadly type while the other is the less dangerous and could be treated easily. A dermatologist spends a lot of time in the examination process and with about 75% to 85% accuracy. Therefore, a fast and accurate solution is needed for solving this problem. Here is where machine learning takes part in the examination process as it saves a lot of time, and its accuracy may exceed the dermatologists' ones. The proposed system will improve the efficiency of skin cancer detection. Also, there are two proposed systems for skin cancer detection. The proposed system is a deep learning-based system that uses CNN, VGG16 and ResNet50 models for classification process. Its accuracy is calculated depending on weighted average. Since the Deep Learning (DL) shows higher efficiency and performance than Machine Learning (ML); therefore, the second proposed system is the applied system for the project.</p>		
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12	Project Title	Stock Performance Forecasting (SDG 8 – SDG 10)	
	Students' Names	181131	Karim Abdelrahman Elsayed Abdelrahman Youssef
		184355	Khaled Ashraf Abdelaziz Mohamed
	Supervised by	Dr. Samer Ibrahim	
Abstract	<p>The stock market is the ideal place to trade and be more educated about the worldwide financial system. Since the beginning of the financial markets, it has been the place to buy and sell assets of some of the great corporations in the form of stocks but every year the market keeps getting bigger and more advanced and includes more than just stocks. Asset classes like bonds, commodities and future contracts have been introduced in recent years which in turn made the financial system more complicated. As a result, algorithmic trading or as it is sometimes called high frequency trading was introduced which required the need for artificial intelligence to be implemented. With the introduction of the algorithmic trading, some markets makers and brokers exploit it to manipulate the market for their favor and improve their financial position in the market. The current state of the market could be said to be unfair to some investors. This study provides a solution different from the current stock prediction tools as it not only analyses the data provided to investors, but it also deploys the use of machine learning algorithm to predict the performance of the stock as well as provide an educational dashboard to investors to further understand the rules of the market, alongside providing financial news as they happen with daily stock recommendations.</p>		
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