

# Project Abstract Report

FINAL YEAR PROJECTS 2021



**SPRING 2021**

Department of Computer Science

# ABSTRACTS

Final year Projects



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<b>Project Title:</b>	<b>Investigating The Impact of COVID - 19 on Mental Health With Sentiment Analysis</b>
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<b>Abstract:</b>	The pandemic which started in 2020 due to Coronavirus has brought grave concerns regarding mental health. Due to social interaction restrictions in place to limit the rise of cases of Coronavirus, it is not possible for health authorities around the globe to estimate the impact of the pandemic. However, the rise of the virus has resulted in unprecedented number of users connecting with one another using social media which can be utilized to identify the impact society's mental health. With the utilization of Bi-Directional LSTM sentiment analysis machine learning model, we have found that around 61 percentage peoples post are negative in nature and in addition to this we also found that majority of these negative posts were related to job related distress. As the pandemic grows and dwindles over time, we will see a unprecedented amount of mental health issues arising in the society which must be dealt with and with the research carried out government around the globe can take appropriate actions beforehand to limit the impact of mental health problems which will arise in the society.

<b>Project Title:</b>	<b>Hate Speech Detection</b>
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<b>Abstract:</b>	Hate speech detection is a huge study that is going all over the world right now and can be seen used by companies like Facebook and Twitter that monitor the post or comments that are being posted online. These companies have setup system to check and filter offensive texts that possibly can be hate. The only issue is that it still needs a lot of work considering how geographical apart all the users are from each other and context in which it is used. Since the work done on Roman Urdu is done on a low scale it becomes a necessity to keep it in view as in Pakistan it is becoming a trend to this language to communicate with each other. We used 5000 tweets and manually annotated them according to four different classifications: normal, gender, political and offensive. The algorithms used to give comparatives are support vector machine (SVM), logistic Regression (LR), Naïve bayes (NB) and Long-Short-Term Memory (LSTM). Our results show that algorithms worked better in Bi-classification in comparative to multi-classification.

<b>Project Title:</b>	<b>Automated Entrance Authorization System</b>
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<b>Abstract:</b>	<p>Automated Entrance Authorization System necessity arises due to Covid-19 pandemic. It can allow entrance to schools, colleges, universities and workplaces without touching anything for identification. Students, teachers and staff at institutions can walk in the campus freely with this hassle free, clean and secure system. They do not have to worry about touching any infected thing. This project is an effort to reduce physical interaction with any machine or person while entering your workplace and/or home etc. This system is to use Raspberry Pi which has a limited processing power and memory, so it needed an algorithm which is light weight as well as accurate. So, this program is using MobileNet Architecture which is a CNN for deep learning in facemask detection. And Viola-Jones Algorithm/Haar Cascade Classifiers is being used for facial recognition. The system will be considered complete when the accuracy of the system lies between 95-99% for facial recognition, 85-90% for mask detection and <math>\pm 0.2^{\circ}\text{C}</math> for temperature measurement. The system will perform each task within a minimum amount of time possible and with maximum efficiency. This system is an aid or facilitation in reducing workload, securing entrance authorization and ensuring health safety measures.</p>

<b>Project Title:</b>	<b>Smart Invigilator</b>
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<b>Abstract:</b>	<p>In the current Times of Covid-19 online education systems are increased a lot. With the increasing online systems there is a requirement of systems that can test the students learning online. But without any app it is very easy for any student to cheat in an online exam by using Internet, books, notes or even with the help of someone else sometimes. It becomes very difficult for a single teacher to check online via webcam for each student in the class that any cheating is done by the student or not. This makes it unfair for the students who study and learn well and end up not getting credited for their hard work. Even if teacher check through the webcam there are students that might not always have an active internet connection making it difficult for them as well as teachers. Looking at these problems we came up with the idea of SMART INVIGILATOR which works offline and doesn't require constant internet connection. Our application only requires internet connection for sending the student report to the teacher via email. This way it is also beneficial for the students who live in remote areas and have a limited access to the internet. Our project uses certain ways to find out the student online learning and invigilate the student for the exam. Our system uses Eye movement tracking, facial attendance and voice keyword tracking to make a final report of the student. The app calculates the right and left</p>



	<p>movements from the screen of student and generates a flag when the students seem to be using any sort of external help for the exams. The app also checked at several intervals if the student giving the exam is the same throughout the exam or not. If the student is changed it flags the time and adds the snapshot to the report. This will help teachers better determine the student for their final results. After the exam is finished the teacher is emailed with a detailed report of the student during exam.</p>
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<b>Project Title:</b>	<b>Social Media Predictive Analytics</b>
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<b>Abstract:</b>	<p>ADPRE is a web based system designed to provide analytics for social media marketing based on the principle of predictive analytics through the use of machine learning. Through this system, individuals, firms, companies and organizations will be able to check social media analytics regarding various keywords and design social media marketing strategies accordingly. It will be designed to not only provide such analytics but also offer recommendations regarding what kind of campaign can be designed for optimal social media reach. Perhaps the most important factor that contributed in the motivation towards this project was the single fact that social media marketing is one of the key trends in the business and marketing worlds today. All brands, big and small, now have a strong presence on social media. Therefore, it is imperative for them to be able to reach a wider audience so that they can easily increase revenue. Reaching a larger audience requires a highly calculated approach; an approach which maximizes reach with the minimum required effort. This can be achieved using specialized tools that are designed to measure social media reach. A web-based system designed to provide analytics for social media marketing based on the principle of predictive analytics through the use of machine learning.</p> <p>Through this system, individuals, firms, companies and</p>

	<p>organizations will be able to check social media analytics regarding various keywords and design social media marketing strategies accordingly. It will be designed to not only provide such analytics but also offer recommendations regarding what kind of campaign can be designed for optimal social media reach. Here we used an agile approach for development. Initially we worked with our sample data and made a prototype based on it. Once we obtained significantly promising results then we created the actual system and ran tests on it to make sure it functions according to our requirements. Once we were confident that our initial requirements were being met, we then decided to go ahead and start the programming and development process so that we could bring our idea to life.</p>
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<b>Project Title:</b>	<b>Indoor Positioning System for S-Block FCCU using Image Processing</b>
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<b>Abstract:</b>	<p>In huge and massive complex structured buildings with a lot of rooms or offices, people find it very time taking and difficult in finding the intended room in the first search. Even in our university FCCU, the freshmen, as well as the senior students, find it hard to locate their classrooms or instructors' offices. So, to overcome this problem we have made an Indoor Positioning and Navigation system to find the current location of the user and navigate him to his desired destination inside the building. It is just like google maps but for indoors. Unlike google maps, it uses WiFi technology instead of Global Positioning System (GPS) because GPS doesn't work for locating paths of indoor buildings and skyscrapers. First, we obtained the floor maps then built an application for the user interface then generated a 2D floor plan for path finding. The application developed works as the user takes a picture of his current location and the application tells him where he is standing currently on the map and then the user selects the destination location and the application displays him the shortest path to his destination. , and the pathfinding. The system is cheap as no specific hardware installation is required. The application is user friendly as it takes input from an image instead of a lot of clicks and typing. The system users will easily and accurately locate their destination and reach in time for class, exam or any event. The</p>

	<p>designed system's algorithm will be implemented as is to any other official space building simply by replacing the soft map of building architecture and room number pixel coordinates. The target is to make a cheap and efficient system that can be used elsewhere also to help people locate their destination inside the building using WiFi. This application will help not only the students but also any outsider who visits the university.</p>
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<b>Project Title:</b>	<b>Selecting Software Development Life Cycle Models</b>
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<b>Abstract:</b>	Whenever we need to develop a system/software, the first thing we need to do is to select the most suitable software development life cycle model. The most common approach for selecting the best suitable software development life cycle model is the expert evaluation. If we do not have any formal guidance then the selection depends too much on expert personality. In this paper we will provide the formal framework for selecting the best SDLC model. We will test our approach for the most common SDLC models in different scenarios.

<b>Project Title:</b>	<b>Emerging Cloud BI in Agriculture Sector</b>
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<b>Abstract:</b>	<p>Cloud BI (Business Intelligence) is the most popular and powerful tool widely used to draw conclusions from raw data, do analysis and making decisions. Reason of emerging BI in agriculture sector is its efficient integrated approach to single management system, scalability and increases profitability. From BI tools the database system is quick responsive and representation improves filtration of data. BI works as an integrated infrastructure system that allows gather complex information through various resources such as IOT devices, SAAS applications etc. into a single module. And implement vast operations on data. The main goal of this research was to check adaptability of Cloud BI tools which help in workplace monitoring analytics and visualized dashboards and reports.</p>

<b>Project Title:</b>	<b>G-Predictia</b>
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<b>Abstract:</b>	<p>G-Predictia is contemplated to be a benefiting platform for the institute as well as the students. It is programmed for the students so that they can take action before their finals, if the marks are not satisfactory and it shall do this by predicting the marks of the students. The student's progress can be tracked by their teachers and they can embolden the students to work hard on their weak areas. Some of the algorithms and work has already been done with great accuracy in this field. We shall get some benefit from this work and improve the results using the work. The core requirement for this project is the marks of the students. The predictions are carried out by the data which first enters our system and then it is pre-processed on the basis of which it is predicted. After the prediction, the data goes through three interfaces where there are three types of users which include HOD, the student and the teacher where they are able to view the results according to the required formats. The prototype for this project has been developed which is a web-based implementation that follows the Model View Controller architecture. We shall be able to obtain the requests of the clients using this view. An appropriate model is called upon the request for the data validation in the controller. After the validation of requested data, it is sent back to the Model View through the controller.</p>



<b>Project Title:</b>	<b>Digital Polio Vaccination System</b>
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<b>Abstract:</b>	<p>Pakistan is one of the unfortunate countries in the world where polio is still to be eradicated. Information technology has revolutionized the health care sector over the last two decades. While other countries are integrating advanced technologies into their health care system; Pakistan is lagging and making very little progress in adapting to this change. The Pakistani dilemma over poliovirus is a mixture of mismanagement, illiteracy, and rigid public behaviors. Polio seems to be a typical Pakistani problem that tends to fade away from time to time but isn't going anywhere soon. With guidelines to solve our local problems (From FCCU CS Department &amp; HEC), we decide to approach this local problem head-on and come up with a solution that is just the right fit for the general dynamics of Pakistan. The Digital Polio Vaccination System seeks to mitigate the mismanagement problem of the poliovirus dilemma of Pakistan moreover it seeks to eliminate outdated practices like wall chalking and paper-based record-keeping with more advanced practices like QR tags/stickers and digital record-keeping. The result will be a better overall system that can help us eradicate the poliovirus from Pakistan.</p>

<b>Project Title:</b>	<b>Know What to Cook</b>
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<b>Abstract:</b>	<p>Our generation relies mostly on phones to get through the day. Due to this, phones have become more of a personal assistant than a means to just communicate. Keeping this thing in mind we wanted to use the concept of a phone as a personal assistant for helping the users to cook like a master even when they do not know a thing about cooking. Most of the times, people cannot decide what to cook and when they do, they do not have complete ingredients to cook it. The system to be made is an Android Application- Food rials, which provides the users with simplified recipes only using the data of ingredients they already have in their kitchen, the search is done with real-time search, the recipes provided are easy to understand and easier to make.</p> <p>The system has a structured UI unlike most of the cooking apps that are available. It provides users recipes along with their preparation time, number of servings, and ingredients that will be required which can be added to the shopping list/ingredients checklist to purchase them later. Users can even find the nearest shops for the ingredients as per their requirement. To make an application which can suggest recipes, based on only the ingredients that a user has at that time. The purpose of the project is to make an application that can help our local community in a budget friendly way and in days of pandemic it can make people enjoy different foods just sitting indoors and staying safe. To make an application that can help our local community in a</p>

budget friendly way and in days of pandemic it can make people enjoy different foods just sitting indoors and staying safe. In days of the pandemic there has been a lot of difficulty in going out for shopping and getting your desired grocery for household. There may be times when people are unable to buy few of the products due to shortage its supply or their limited incomes due to the pandemic or poverty. In times like these, it is very difficult for some people of our society to cook their favorite foods or even enjoy different types of foods in their home, with the limited resources that they have. Keeping in view of this issue we decided to build a grocery app that can help us in this social concern. This application can make people explore their choices when making food and they can be doing this by using only the items that they have in their home. Our application will guide the user how they can make use their only ingredients that they have, to make something new and enjoy it. Surely there are many good recipe apps which provide thousands of recipes but a good application lacks a small feature that prevents it from making it a great application because in a country like Pakistan people usually try to make the food which costs the lowest when it comes to buying its ingredients and when following a given recipe there are a lot of ingredients which are not already available in one's kitchen. Therefore, there was a need for an application that can just ask the users about what they have in their home and can provide them with all the world-wide choice of dishes that they can make by using only the ingredients that they have. The application can provide a new way of introducing foreign dishes in Pakistan. This will not only be helping our country economically but can provide certain social benefits as well.

<b>Project Title:</b>	<b>Women Safety Application</b>
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<b>Abstract:</b>	<p>The issue of women’s safety is one that has only gotten more important over time. This problem is complex and multi-disciplinary. There are sociological factors, environmental factors, psychological factors and economic factors all at play. Hence, it is equally possible to tackle this issue on all of these fronts. We are tackling this by building an android application women can use to better protect themselves, especially here as Pakistan is the fourth worst country for women according to recently released rankings of the Women, Peace and Security Index. In preparation for this, we have gone through every similar application already available, and we have found a critical flaw or missing feature in all of them. In addition, many of them are in one way or another specifically for people outside of Pakistan. The result of our work is a localized application that is incrementally better than any competitors, as well as having features not yet introduced to this space at all. As such, it is hard to give specific numbers for how much better our app is, it is as many times better as the number of apps you would have to download to replace it. Overall, our work has also revealed that this area of software development is very underdeveloped and many strides are yet to be made following our own work.</p>

<b>Project Title:</b>	<b>404Found: We sever at your doorstep</b>
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<b>Abstract:</b>	<p>Daily life routine chores are being simplified made easier and quicker to perform with the help of technology. Every new technology and tech device is for the betterment of the globe and human. These things make us more efficient and productive. We also should literate our society about the technology. In this project, we decided to educate and serve our society with the services of 404 Found (“We serve at your doorstep”). We will develop a mobile app and website for the Pakistani users. With the help of this platform, a user does not have to worry about their out of order tech devices. We will fix their devices at their doorstep if it is minor problem in it, otherwise our representative collects their device from customer doorstep and return it back to them after getting repaired. In addition, if they are interested to install the new embedded system in their house to make houses smart and automated, we will also assist them. In return you can say that you can monitor or control your house through your mobile phone. With the help of this app, they do not have to worry about visiting the market for any kind of issue or query related to the tech device. Just simple send a request through the mobile app or website. Our repetitive will contact you back in timely manners. They can avail all our services at their doorstep without any hustle.</p>

<b>Project Title:</b>	<b>ASL Translator – Signulation</b>
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<b>Abstract:</b>	<p>As per research, 430 million of the total world population is aurally impaired, and it is challenging for an aurally impaired individual to communicate with others. Even if the deaf person knows sign language, the other person he or she wants to communicate with may not. Our ASL project aims to solve this problem by training a model that translates significant 39 signs of ASL. With our web-based application and trained model, this barrier of communication can be eliminated. This streamlining can makes communication more accessible for a disabled person, thus helping society. Our model is comprehensively trained, and its applications can meaningfully contribute to learning, teaching, researching, and translating the ASL. This project's main functionality and goal were to convert sign-to-text, but we also implemented the text-to-sign functionality along with it. We collected the dataset ourselves for the sign-to-text functionality, labeled the dataset for XML files, and some preprocessing techniques such as thresholding. We used the SSD algorithm and architecture, which consists of VGG-16 as the backbone network followed by six more convolutional layers, which gives 8732 predictions per class, providing us with accurate and optimum results. Unlike other publicly available ML models that work on image prediction with less frequency, we make real-time detections with up to 85-95%</p>

	accuracy per gesture for all 39 gestures. The model's training was done on a GPU using Tensorflow-GPU, CUDA, and cuDNN, with Python being the primary programming language. After model training, we implemented it in a web application that supports all devices, and we used React.JS because TFJS supports it excellently.
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<b>Project Title:</b>	<b>Lung Cancer Detection Using Image Processing and Machine Learning Algorithms</b>
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<b>Abstract:</b>	In this research, an artificially trained system is presented that aims to help reduce biopsies and the time it takes to detect lung cancer through normal procedures followed by doctors. Early detection of cancer can help save lives which can be achieved by the automation of the classification process. This project makes use of CT Scans as they provide very detailed images and are more likely to show lung tumors than regular chest x-rays. They can also show the size, shape and position of any lung tumors. In the first step, all the dicom images are read and pre-processed by the system. After this, the region of interest is extracted. Features such as mean, entropy, energy, contrast and homogeneity are extracted from each image in the training set. For this research, a model is trained using the k-mean clustering algorithm based on the five extracted features. One of the advantages of using k-means is that it scales to large data and easily adapts to new examples. Many challenges were faced such as reading and applying filters on dicom images. The patients' data are kept confidential by the hospitals hence it was very difficult to gather huge dataset. Evaluation is done on the basis of tumors which are correctly classified. It was observed that all the five features combined yield the highest accuracy of 94%.



<b>Project Title:</b>	<b>Decorum Management System</b>
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<b>Abstract:</b>	The biggest motivation that we have in developing Decorum Management System was our interest in constructing a hardware based project and with the COVID outbreak masks detection made its way into our project. In addition fingerprints were used to recognize who is entering the class. We wanted to insure that only the ones with masks will be allowed in the class and only if the student is having the class then may enter into the class. So we make the door lock system with a camera for mask detection, finger print sensor to recognize the entrant and a web base data base to check who enters and keep a record of them. Our program include a face detection program in a raspberry pi, which is triggered by the finger print sensor which uses a C language like code in Arduino IDE. Then it is connected to a web server coded with JavaScript, PHP and HTML.

<b>Project Title:</b>	<b>Smart Mirror</b>
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<b>Abstract:</b>	<p>Today, our world is filled with devices which provide us information at a glance anywhere and anytime. While fetching this data, the user requires interaction with the device which compels time consumption. As technology progresses, it is always of big importance to develop and introduce new ways of interaction with these devices. For example, first we had pencil and paper to deliver information which was then massively reduced after computers and mobile phones. What we think, is that these devices and technology should be more integrated in our households and lives for a more reliable and luxurious experience. To push these devices further, we have introduced Smart Mirror which integrates a normal mirror with information and data which can be used in daily life of the user. The information is provided at the user's glance. The mirror will operate based on voice commands and our main focus is to provide information to users in their daily routine especially where your phone usage is not really an option.</p>

<b>Project Title:</b>	<b>A new approach towards L4 Cache with RISC-V Processor</b>
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<b>Abstract:</b>	<p>We are living in a world where massive developments are taking place day by day in the field of software and hardware as well. We are surrounded by multiple gadgets starting from computers, to laptops, to tabs, smart phones and now even smart watches. All of these require a certain processor to work and for every gadget the processor will behave differently as some will be using compressed instructions to save energy while others won't be focusing on energy consumption but giving more and more results in less time, so this raises an issue that can someone design their own processor and evade paying the millions in royalties. The answer today is yes they can. The motivation of the project was to develop a new architecture in the field of hardware where we can use a license free ISA such as RISC-V and form a new Cache architecture which will speed up the general computation and speed up the processing speed of the system. Fabrication of a new chip is a very difficult and expensive process where acquiring a license is tough but if you want to make changes in that architecture you are not going to be able to do that because it isn't a free ISA. Furthermore, if we want to make any changes in the already existing hardware then we have to pay millions. The approach initially decided was to use the VerilogHDL alongside the Xilinx FPGA to implement partial ISA of RISC-V and make some</p>

	<p>architectural changes. However, moving along the project we encountered barriers like the essential software was banned by the USA in Pakistan, which resulted in a theoretical paper, where the ISA of RISC-V is discussed and a new Cache architecture is proposed. It is a theoretical paper, and since there was a ban on the software, actual implementation of this using the Xilinx tools wasn't possible. There is a chance that the new proposed architecture of the Cache can make significant changes in the world of hardware especially in the PC's and the laptops, as it allows more base address and parallelism.</p>
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<b>Project Title:</b>	<b>Easy Serve - Multi-Purpose and Multi-Functional Application system for Dine-In Environment</b>
<b>Students:</b>	021-10472 Dawood Suleman Sahi 021-10202 Hashim Riaz 020-11237 Numair Bin Mehmood
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<b>Abstract:</b>	This project is aimed at developing an online multi-functional, multi-purpose dining system that is of importance to the food industry. This system is a web based application that will be accessed through tabs wherever the system is implemented. This system will automate the workflow and the room for human error will be net to none. There are features like online ordering, food review, live stream your order and tracking the status of the order.

<b>Project Title:</b>	<b>Sign Language with Deep Learning</b>
<b>Students:</b>	21-10327 Ahmed Hamza Bin Asif 21-10451 Ayesha 21-10361 Muhammad Khuzaima Bashir 21-10195 Reja Nadeem
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<b>Abstract:</b>	In our project we are encountering the issues that are faced by hearing impaired people while communicating with the normal person. We are developing a software application using advanced deep learning models which will translate hand gestures in the video to English sentence so that it can be understood by the normal person.

<b>Project Title:</b>	<b>Front Face Generation with GAN</b>
<b>Students:</b>	21-10374 Joshua Sarosh 21-10602 Ayza Nadeem 21-11051 Shameen Jamil
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<b>Abstract:</b>	<p>With the rise in security risks, a leading problem that is faced is that surveillance footages are not able to capture the full face of a suspect or a culprit. This is a serious obstacle that if was removed could fast track the process of identification of the person and in turn could save lives. The whole purpose of surveillance cameras is deemed useless if the face of a culprit captured on the footage is not usable or clearly visible. The ill-posed or half face captured on the camera are dead ends in the domain of Law Enforcement. Therefore generation of a front facing image of a person from a side posed image would work wonders in law enforcement, security, and surveillance aspects. In this project we aimed to build a deep learning model that generated front faced images of a subject from one or more side posed or ill-posed images. We used a GAN model which is a really efficient framework of machine/deep learning. Though there are many different types of a GAN Model we studied and worked with PosIX-GAN and conditional DCGAN and implemented a variation of these models. To eventually generate front-facing images from side profiles This process followed the generic Deep Learning Model pipeline, where the data was first preprocessed and organized to pass to the GAN model for training. We converted a POSIX-GAN model in Keras Tensorflow framework to</p>

	<p>PyTorch and worked on two more models namely DCGAN and a variant of CGAN. The resultant model that we created was trained on different sizes of training data and different configurations of the hyper-parameters. Eventually, even though we aimed for our results to be more specific to the surveillance domain, we found the results to be more general purpose than specifically for surveillance.</p>
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<b>Project Title:</b>	<b>Sketch to Image Generation</b>
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<b>Abstract:</b>	<p>Many people have the ability to develop detailed sketches but not all of them have the knowledge or means to convert those sketches into a digital art. Learning to develop these digital arts takes some time in order to develop a decent looking art. The problem that arises is that people, not being accustomed to the technology, when try to digitalize the image, are not able to produce great results. The aim of this project is to help that audience by automating their work and providing them with an easy-to-use program that will generate such colored images from their sketches. These images can then be used in their art projects or even in game development and save them a lot of time. In order to solve this problem, we had to research what was the best approach to go about solving the problem at hand. Upon researching, we found out that Generative Adversarial Network (GAN) is used for such kind of problems. GAN is a deep learning model that learns what images are to be produced on what kind of input. In our case, we provided a sketch as input image and trained our model to produce something closer or exactly like the actual image. We then proceeded to add GUI in order to deploy our product. We made our product as simple as possible without any extra features in order to remove complexities in usage. We have applied various</p>

	<p>models for our project that were in Tensorflow and PyTorch. We used Tensor and PyTorch implementations of Pix2Pix and SketchyGAN. We then translated the Tensorflow model that we found into PyTorch. We could not find the dataset, thus we had to make our own by collecting images of different scenes and landscapes, converted them into sketches, made a collage of original image on left and sketch on right for each 8090 images, and split the dataset into train and test dataset. The final results of the product are not perfect as we had originally imagined they would be but on the other hand, they are not bad either. It does manage to classify different objects but during colorization of these objects, there tend to be some inaccuracies.</p>
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<b>Project Title:</b>	<b>Image and Video Steganography using Deep Learning A self-supervised Approach</b>
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<b>Abstract:</b>	<p>Due to ubiquitous amount of visual data present on the internet and all important information being transformed into digital media, the cases of data loss and unauthorized access and sharing of data are also increasing. Steganography is the art of hiding the secret message into the carrier message in such a way that the secret message is imperceptible to human eye which is embedded in the carrier image. It can provide a safe and secure transfer of data between the sender and receiver and prevent the unintended users from accessing our data. Steganography can be completely automated with AI by implementing it with models from deep learning. We have used auto-encoders and convolution layers to implement image-to-image and video-to-video steganography. The model yielded promising results compared to the results observed in other research papers. Also, the technique stands effective against steganalysis and proves to be more useful than previous steganography methods where steganography was implemented using LSB and MSB substitutions. The methodology can be used to develop a model which produced reassuring stego-images and stego-videos and the model can later be used to also decode and reveal the secret image and video from the carrier message.</p>

<b>Project Title:</b>	<b>Fake News Detection</b>
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<b>Abstract:</b>	<p>Misguidance by fabricated news which often is created for monetary profit, mass manipulation &amp; propaganda purposes is a societal illness. It is of utmost importance to spread awareness about fake news spread and having people equipped with resources good enough to tell the authentic content. We believe being able to distinguish information in this setting with authenticity in mind is a major step for a society. This field of work is a challenge because artificial intelligence and machine learning with respect to the detection of Neural Fake News is an emerging field altogether. We're trying to provide a platform for people to enable them to check their preferred news content's authenticity. The scope of this project is not only local but also global as it will be a website accessible by anyone in the world. In order to make progress on this project we researched journal articles pertaining to Fake News detecting which covered analytical techniques, various approaches to preprocessing data and a deep study of neural fake news creation and detection. In order to make our algorithm work we controlled and focused more on the training variable when compared to the testing variable. In our scenario, there are two phases at work: Testing Phase which gives an accuracy of 98.3% and Training Phase where all the data is trained pertaining to the datasets.</p>

<b>Project Title:</b>	<b>IOT-ENABLED electric power control</b>
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<b>Abstract:</b>	Wastage of electricity brings about spikes in electricity bills. People often neglect the simple practice of turning on/off the switches when needed which sometimes causes accidents. The proposed solution is to make an application which will target the appliances using a secure internet connection and enable the users to take control of their appliances. It will allow the user to control the working of the devices and hence save the device from possible damage and misuse of power at the same time. The user will also be able to securely take charge of the appliances even when not at home. The application can be used in homes, workplaces and elsewhere.

<b>Project Title:</b>	<b>COVID-BOY! 2D GAME</b>
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<b>Abstract:</b>	<p>Since Childhood we have been playing games and have spent countless hours playing video games. It has always been a dream of ours to build a game so when it came to our Final Year Project we decided to make an adventure game. The idea for the game came to us while figuring out a way to impact the world with our project. As this pandemic hit which is one of a kind that earth has faced we witnessed it widespread because of the unawareness of the basic measure mandatory for its containment. As of responsible engineers of tomorrow, it is a responsibility to help humanity understand its severity by any means possible. Covid-Boy! Our android-based adventure game is a project with 2-dimensional gameplay created to spread awareness in the society about this CoronaVirus and some of the necessary SOP's that everyone needs to follow in a fun way wrapped around an audacious journey to a mysterious island. A 2-D based approach for this application is selected to make its gameplay simple. As games are more popular in kids that are less than 13 years old and are proven to have more impact on their behavior as well. And these kids are spending more and more time on their phones and tablets since schools and other public places are closed due to Covid. These kids are using all sorts of applications while quarantined in their homes. Covid-Boy! is</p>

	<p>expected to get a huge audience. With the reference of safety measures that have been given by the experts we have formulated an adventurous visual simulation that would attract the attention of the teenagers and kids through an amazing story. As a software engineer, we have used the platform that involves the use of the C# language of unity. This game would be freely available on all android based platforms. We hope to indulge the youth, specifically, teenagers and kids through this gaming platform. We hope to make significant positive changes in society. The only implication that we will face is that people will have their own free will whether to use this game or not. Hence there will be generalized approximate results.</p>
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<b>Project Title:</b>	<b>Real-Time Language Translation Application</b>
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<b>Abstract:</b>	<p>The advent of internet has made the world a global village. The facility of rapid fund transfer and the innovation like Bitcoin has digitalized our ways of marketing, thus, converting it into a digital future. The business world walks fast, and with this we need a platform where people can talk easily and communicate regularly without fearing the barriers like language and privacy; a system where people can work together, share their ideas, innovate new concepts, and think freely without having second thoughts about the obstacles that may arrive due to inconvenient communication boards. The idea of a real time language translating app is built while considering these labors. he theory of a decentralized network where people are connected to each other and do not have to worry about a third party involving in their business further ensures the privacy that the world needs when sharing sensitive business information over the network. A real-time language translating platform built with cloud computing and on the basis of a peer-to-peer decentralized system makes this platform a best opportunity to work without barriers and live without the fear of privacy, is exactly what the world needs the current moment.</p>



<b>Project Title:</b>	<b>Cytron: Sentinel of Mankind</b>
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<b>Abstract:</b>	<p>Cytron: Sentinel of Mankind, is a Simulation game for windows where the player plays as a robot, simulating colonies and development of resources, facing challenges and surviving for a given number of levels, upgrading tools for the challenges of each level while completing the game. It is a simulation game, meaning that much of the in-game time is spent on exploration and utilization of the in game mechanics. This game's design is specifically towards strategy simulation and survival. One of the goals of the game is to keep the player busy, discovering mechanics and using those mechanics creatively to build their own world during the gameplay. By integrating story with simulation genre, we hope to implement such an environment that is enjoyed by both the survival and simulation loving players the best experience and enjoyment. By combining different levels and worlds of different color schemes we have made the game more interesting visually as well despite the lack of exceptional artistic skills of any of the developers involved, making it also attractive and visually appealing to the lower age player base. The game is made for entertainment purposes only. It is made in Unity game engine, and written in C-sharp language.</p>

<b>Project Title:</b>	<b>Detecting a backdoor attack using machine learning classification models</b>
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<b>Abstract:</b>	<p>Backdoor is a malware that is used to get access to a computer system in an illegitimate way. Hackers use backdoors to bypass security of a website and use it for their own advantage. E.g., blackmailing after stealing sensitive data, generating DDoS attacks etc. We have witnessed during recent times that the scanners present have not been able to detect the new attacks and the websites have been severely compromised along with data being stolen. In order to protect web activities from malicious intruders, there is a crucial requirement to install backdoor scanning mechanism to ensure robust, secure and reliable services provided by websites. This paper demonstrates a malicious activity detection framework by utilizing two variable methods of Deep Learning: Convolutional Neural Networks (CNN) and Multi-Layer Perceptron (MLP) These frameworks provide us a basis of malicious attack prediction. We shall be using the renowned data set UNSW-NB15, the accuracy analysis of its results are investigated and discussed alongside the usage of F1-Score.</p>

<b>Project Title:</b>	<b>Usability Evaluation and Formulation of UI Design Patterns for Mobile Banking Apps</b>
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<b>Abstract:</b>	<p>As everything has been shifted towards the online platforms in these past 2 years due to Covid-19. An observation made that people were reluctant towards using the mobile banking apps and preferred going to the banks instead. The reason behind this was the poor user interface of the majority of popular banks which made them difficult for the users to use. The main focus of this research was to reduce the issues users were facing as it will automatically assist the people of Pakistan. The plan was to use the most downloadable banking apps of Pakistan to conduct the research on users of different age groups to get the accurate and biased results. The users were asked to perform a series of tasks on each app simultaneously and a retrospective testing technique was used to analyze the results. It was realised that each banking app had their own flaws which can be reduced by using the already existing UI patterns and the UI patterns that were formulated after this research. A functional prototype was made that can be an ideal example of a user-friendly banking app. A test was conducted where a couple of users used the functional prototype and had no issues while using it which proved that this prototype will benefit the banks and the users equally.</p>