# BS Projects

Please follow the projects check-list for better project execution, control and delivery.

Display/hide assigned projects

## 1. Analysis modelling tool and assignment checking aid

**Dr. Onaiza Maqbool**

*Offered:* *Assigned:* *Student: Inam Karim*

The project is concerned with design and development of a web app that will allow students to develop the use case model and the detailed design model. The app will have a development mode (which allows students to make mistakes), a tutorial mode (that corrects mistakes) and a checking mode (which allows students assignments to be checked for mistakes). A special feature will involve checking consistency across diagrams e.g. between the use case diagram and text, or between text and system sequence diagram (SSD), or between SSD and sequence diagram.

## 2. Arabic Synonym index and finder

**Dr. Onaiza Maqbool**

*Offered:* *Assigned:* *Student: Taimoor Sultan*

Arabic, like any other language, has word synonyms. The purpose of this project is to develop a software application (web based) that will allow to maintain a list of synonyms for words, and then allow them to be searched in the Quranic text. It will be possible for a non-Arabic reader to enter a word in transliteration form in English for searching. The application will indicate all the places where a word and its synonym exist both as a list, as well as actual locations. The software will also allow a user to test his/her knowledge of Arabic words and synonyms through quizzes.

## 3. Use of AI to enhance the engagement and Learning capabilities of Students Suffering with Autism

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned:* *Student:Nauman Ejaz*

The project will mostly focus on developing an application which will check the student engagement using videos, chats, audios and interactions. It will be helpful to identify those students and help them to learn those topics in which they are facing difficulty. The activities/emotions that we ll focus on: engaged, happy, unhappy, active, passive, angry, detrack, normal.

## 4. IoT Based Mother and Fetus Health Care Monitoring

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned:* *Student: Khurram Shahzad*

The project aims to develop an IoT based smart device/belt to measure and get real time data. We will gather information about BP, temperature, sugar level, movement and position of the fetus. We will also develop an application to further analyse the received data and take the necessary measures accordingly in consultation with Doctors/Nurse.

## 5. AI Based Image Analysis to Identify Plant Disease

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned:* *Student:*

An app will be developed whenere Images from Plant leaves will be captured and will be further analysed to find the type of disease as well as the level of disease and recommend the necessary medicine or pesticides to the farmers. The drones can be used to gather videos from a field and analyse them to separate the healthy and compromised crops.

## 6. Offline Urdu/pashto Handwriting detection using deep learning

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned:* *Student:*

This project aims to design an application using deep learning and CNN, which can detect the writer's handwriting using computer vision and pattern recognition. Here we will train and label the given data set using deep learning techniques

then we will test with accuracy rate. This application will help to digitize the handwritten based text data in MS word format.

## 7. Organic Food Traceability Using Blockchain

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned: Shayan Danish* *Student:*

This project proposes a blockchain solution to improve traceability in the fruit supply chain. This will enhance transparency, traceability and consumer confidence in the fruit industry. This project will automate processes with the fruit supply chain. Develop a blockchain-based traceability system for the fruit supply chain. We will implement smart contracts to automate processes and ensure data integrity.

## 8. AI Based Quran Teacher / Instructor

**Dr. Muazzam A. Khan Khattak**

*Offered:* *Assigned:* *Student: Hafiz Muhammad Hassaan Abdullah*

Without a teacher or mentor, it is difficult to memorize specifically and to identify mistakes while reciting without having progress tracking and not everyone has access to Quran Teacher. Users will recite and the text will be highlighted in real time, will identify errors and mistakes done in reciting through highlighting the incorrect recited text with different color, a short tune and vibration of device. Also will count mistakes and give progress to the user at the end of session. Users can also hide or unhide the ayat to test their memorization. Flutter : Frontend Development. Firebase : Backend Development for user authentication, progress tracking and for storing the data as well. Speech Recognition: Google Speech to Text API will be used to convert user recitation into text and compare it with correct verses. Quranâ€™s Text Integration: The Quran API will be used for that.

## 9. Aurdino / Android-based Smart Watch

**Dr. Mudassar Azam Sindhu**

*Offered: October 2024* *Assigned:* *Student: Sanan Adil*

Smart watches have become quite common these days and are quite popular among health and sports enthusiasts. The goal of this project is to design and build our own prototype smart watch using a micro-controller like the Arduino and using appropriate sensors like the pulse sensor, the blood pressure sensor and pulse oximeter sensor etc. The watch will in general show the current time, step count and calories burnt on the main display. Plus, the readings from the sensors through the controller and displaying their values on a OLED display for the controller. The student will also build an accompanying android app that will be used to connect with the smart watch and show readings/history on the dashboard of the app.

## 10. Web Application Parsing

**Dr. Mudassar Azam Sindhu**

*Offered: October 2024* *Assigned:* *Student:*

This project is going to benefit those students who are studying the course on compilers. They can get hands on experience of implementing some of the parsing algorithms which will be discussed during the course on compilers. These include the recursive descent, predictive parsing, shift-reduce parsing algorithms etc. The student will implement these algorithms and show the visualization of the parsing of a string using the selected algorithms. This will enable those learning the course to see how different parsing strategies work and whether a particular is successfully parsed or not using the parsing strategies mentioned above.

## 11. Harmful and Abusive Language Detection

**Ms. Ifrah Farrukh Khan**

*Offered:* *Assigned:* *Student: Hifza Ashraf*

The project focuses on developing an edge-deployed algorithm that operates in real-time to detect offensive or harmful language in conversations and generate instant alerts. This project will provide hands-on experience in AI-driven language detection while addressing a critical real-world challenge.

## 12. CCTV based Home Security System

**Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student:Areej Batool*

The system will monitor activities outside the house using CCTV cameras. To do this, the system will first register the residents of the house and recognize them. If an unknown person is detected in the video within the vicinity of the house, an alarm will be triggered.

## 13. Suspicious Activity Detection

**Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student:*

The system will monitor CCTV cameras to analyze data. It will train a model for suspicious activity detection and use it to interpret patterns, identify concerns, and flag potential threats with precision. Upon detecting suspicious activity, appropriate measures will be activated, such as contacting local police or security.

## 14. Smart Medical Image Annotation Tool

**Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student:*

Huge number of medical images are generated for different types of diagnosis through imaging modalities like X-rays, CT-Scans, MRI, PET etc. Mechanism is needed to annotate the region of interest (ROI) in medical images for further processing and accurate diagnosis through artificial intelligence-based methods. The purpose of this annotation tool is to initially identify the ROI in a sample medical imaging data after consultation with the radiologist(s). Later, these annotations will be used to automatically annotate the other data of similar nature using semi supervised learning. Tool will provide different options to the radiologists to visualize the annotations and change them accordingly in case of any wrong labeling done by the system.

## 15. Course Allocation & Scheduling

**Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student: Awais Ali*

Course allocation and timetable generation are the academic activities to be performed by the departments in colleges and universities, manually at the start of each semester. Purpose of this project to automate the course allocation and timetable generation process using intelligent techniques. System will get input from the faculty members about their course and timetable preferences and will automatically assign courses to faculty and generate clash free timetable.

## 16. AI-Based Credit Scoring/Assessment

**Industry Defined Project shared through Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student: Awais Ali*

**Industry: Safari Phones**
**Leading to Internship**

Project Overview: The project aims to develop an AI-based credit scoring system that processes preloaded transactional and demographic data to assess the creditworthiness of users identified by their SubscriberId. The system will generate a credit score for a subscriber based on historical data stored in the system. The system will automate the credit evaluation process using machine learning algorithms and provide personalized credit assessments. Objectives: 1. Develop a Credit Scoring Model: Build a machine learning model using preloaded transactional data (e.g., transaction amounts, service usage) and demographic data (e.g., age, income, location) to generate a credit score for a user. 2. Efficient Data Processing: Implement an efficient processing mechanism where, given a SubscriberId, the system will retrieve relevant data and generate a credit score. 3. Create a User-Friendly Interface: Develop a simple system or prototype that allows a user (or administrator) to input a SubscriberId and retrieve a credit score. It should also generate a report describing the factors that influenced the credit score. 4. Demonstrate AI Capabilities: Show how AI models can be used to process historical data for predictive credit scoring. Scope: â—□ Preloaded Data: The system will use preloaded historical data, including: â—‹ Transactional data: Transaction Amount, ServiceName, Account Balance, etc. â—‹ Demographic data: Age, Monthly Income, Job Information, Education Level, Location. â—□ Model Development: The AI model will be trained on preloaded data and will generate a credit score for any provided SubscriberId. â—□ User Interface: A simple system that allows a user (administrator) to enter a SubscriberId, which will then trigger the system to return the credit score based on preloaded data. â—□ Batch Processing: The system will process batches of data to generate credit scores for all subscribers in the dataset. Key Deliverables: 1. Machine Learning Model: A trained AI model for credit scoring that works with preloaded data. 2. Data Preprocessing Scripts: Scripts for cleaning and transforming the preloaded data into a format usable by the machine learning model. 3. Prototype System: A functional prototype or software that takes a SubscriberId and processes it to generate a credit score based on the preloaded data. It should also generate a report describing the factors that influenced the credit score. 4. Documentation: A final report detailing the methodology, results, AI models used, and the factors that influenced the credit score. Presentation: A PowerPoint presentation summarizing the project, demonstrating the systemâ€™s capabilities, and explaining the machine learning model.

## 17. Personalized Campaign Generator for Telecom Subscribers using Call Detail Records (CDRs), IP Detail Records (IPDRs), and SMS Records

**Industry Defined Project shared through Dr. Ayyaz Hussain**

*Offered:* *Assigned:* *Student:*

**Industry: Safari Phones**
**Leading to Internship**

The rapid growth of the telecom industry has led to an increasing need for personalized marketing strategies to enhance customer engagement and loyalty. This project proposes the development of a Personalized Campaign Generator (PCG) that leverages Call Detail Records (CDRs), IP Detail Records (IPDRs), and SMS records to create targeted marketing campaigns for telecom subscribers. The PCG system utilizes machine learning algorithms to analyze CDRs, IPDRs, and SMS records, extracting valuable insights on subscribers' behavior, preferences, and interests. The integrated data analysis considers various factors, including: - Location-based data (e.g., cell tower locations, roaming patterns) - Communication patterns (e.g., local and international destinations, frequency, and duration) - Data usage habits (e.g., IPDRs for internet

browsing, streaming, and downloads) - Messaging behavior (e.g., SMS records for frequency, and recipient analysis) This comprehensive analysis enables the PCG system to generate personalized campaigns, including tailored promotions, offers, and content, to individual subscribers or specific customer segments. The proposed system aims to improve campaign effectiveness, increase customer satisfaction, and reduce churn rates. By providing a scalable and efficient solution for personalized marketing, the PCG system has the potential to transform the telecom industry's approach to customer engagement and retention.

## 18. Gift Recommender: A Gift Selection Tool

**Dr. Umer Rashid**

*Offered:* *Assigned:* *Student: Farukh Kaleem*

The selection of gifts for loved ones at special events, i.e., birthdays, wedding anniversaries, promotions, Eids, etc., is cumbersome. People face difficulties in gifts selected for their loved ones, hence they seek recommendations from others. The gift selection is primarily based on user preferences, budget constraints, the nature of the event, and the person to whom the gift is purchased. Our objective is to design and develop an Artificial Intelligence-based tool to recommend suitable gifts. The tool gathers gift information from multiple websites and later recommends suitable gifts to the users.

## 19. An Image Analysis Tool to Segregate Waste

**Dr. Umer Rashid**

*Offered:* *Assigned:* *Student: Shaheer Hamza*

The rising landfilling of growing waste volume is a major environmental concern, calling for better waste collection and management solutions. Recycling is one of the major solutions to this problem, as it preserves recyclable resources so they can be turned into new products and not lost to the landfill as waste. However, it requires the categorization of the waste into different categories. In this project, we will design and develop a tool that may capture photographs of waste and segregate the waste into several different categories. The analysis of the waste-related photographs and the identification of several different waste types in the photographs may help in the later recycling of the waste products.

## 20. A Tool to Detect the Face Beauty

**Dr. Umer Rashid**

*Offered:* *Assigned:* *Student:Syed Sheraz Shah*

The facial features, i.e., eyes, nose, mouth, ears, eyebrows, etc., and their geometric symmetry can be used to rate the beauty of the face. In addition to the facial features and their symmetry, the hairstyle, skin tones, and texture also contribute to the face beauty rating. In this project, we will design and develop a tool that will approximate face beauty by considering the above-mentioned attributes. Initially, the tool approximates the face beauty via statistical measures to accumulate a test dataset. The tool later predicts face beauty by employing deep learning techniques over the accumulated dataset.

## 21. Automatic emoji detection from the text sentiments

**Dr. Umer Rashid**

*Offered:* *Assigned:* *Student: Muhammad Faizan Kiani*

In textual communication via social media platforms the users usually type via language support; however, they often annotate the textual content via emojis. The objective is to communicate the context and expressions along with text messages. In this project, we suggest a language-based approach that automatically predicts the emojis related to the English sentences. The tool may be integrated with some social media applications and annotate the textual messages via emojis. The approach mainly exploits the user profile and interaction behavior in the prediction of emojis.

## 22. AI-Personal Assistant for the University Students

**Dr. Umer Rashid**

*Offered:* *Assigned:* *Student: Talha Bilal*

Nowadays, university students face difficulties to follow the academic schedules in a convenient way, since progress of science and technology and availability of the social media platform diverts their attention. We are intended to design and develop an AI-powered assistant tool that supports the university students to manage their academic activities in a usable way. The tool enables the students to follow their schedules, i.e., classes timing, assignments, announced tests and other deliverables etc. The tool also tracks the studentâ€™s semester progress and give suggestions to enhance the academic/semester performance in an interactive way. Furthermore, the tool allows to set reminders, organize tasks, and sync with calendar apps using voice commands. It will also provide personalized study plans, track progress, and offer stress management tips, making student life more organized and productive via an AI-assisted tool.

## 23. Video/book/page to PPT slide generation

**Dr. Akmal Saeed Khattak**

*Offered:* *Assigned:* *Student: Muhammad Hozaif*

The primary focus of this project is to create PowerPoint slides that are both compact and informative in terms of content delivery. The user must provide either an URL of online material, such as a video lecture, or upload input files in various

formats, including video or books. The application will then convert the material to self-sufficient PowerPoint slides to explain the complex concept interactively and easily.

## 24. AI-enabled Legal Document Summarization

**Dr. Akmal Saeed Khattak**

*Offered:* *Assigned:* *Student: Faizan Rabbani*

The focus of this project is to generate a summarization of contracts and agreements, real estate documents, court litigation documents, intellectual property documents, financial and tax documents, and governmental compliance documents.

## 25. AI-enabled Test and Interview Preparation Coach

**Dr. Akmal Saeed Khattak**

*Offered:* *Assigned:* *Student: Ali Huzaifa*

This project will help professionals or any level individual seeking to prepare himself or herself for a certain job test and interview. The system will simply take the job description, responsibilities, and other specified topics to prepare various tests and interview sessions. After each session, the score is shown, along with recommendations in areas where improvement can be made.

19/25 projects assigned. 6 projects unassigned.


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