

## RP1001

**Title: Develop a Web - based System for the Prediction of Customer behavior for Insurance companies using DL models.**

### **Problem Statement:**

The main objective of the project is to classify whether the customer is prominent or not. While taking the insurance the company will verify the customers history and as well as govt. Insurance companies will check who are the prominent customers, whether they are eligible for insurance schemes or not in a particular company. Applied DL to detect the prominent customer in an insurance domain with the help of CRISP methodology.

## RP1002

**Title: "Development of a Web-Based System for Ranking Engineering Colleges Using Deep Learning Models"**

### **Problem Statement:**

The increasing number of engineering colleges and the variety of factors influencing their quality make it challenging for students to select the most suitable institution. Factors such as placements, academic reputation, infrastructure, fees, and location all contribute to the decision-making process. This project aims to design and develop a web-based application using the MERN stack (MongoDB, Express.js, React, and Node.js) integrated with machine learning models to rank engineering colleges dynamically.

### **End Users and Use Cases:**

Students who are seeking admission into Engineering college and wants to decide best among the top choices.

**ABSTRACT**

**Real-time Emotion Detection in Online Assessments**

The detection of emotions in real-time plays a crucial role in enhancing the examination process and improving the overall experience for both students and administrators. This project focuses on developing an intelligent system that leverages computer vision and AI/ML models to analyze facial expressions and detect emotions such as stress, focus, and confusion during online assessments. By integrating real-time video analysis, the system interprets students' emotional states, providing valuable insights to educators. Additionally, a dashboard visualizes emotional data, enabling exam monitoring, engagement analysis, and assessment adaptation. This solution aims to improve online evaluation methodologies by ensuring a more interactive, adaptive, and insightful learning environment.

For real-time analysis, the project integrates OpenCV for video processing, TensorFlow/Keras for emotion detection, and a convolutional neural network (CNN)-based model trained on facial emotion datasets. The system further employs feature extraction techniques such as HOG (Histogram of Oriented Gradients) and deep feature embeddings to improve classification accuracy. To facilitate decision-making, an interactive dashboard is implemented using Flask/Django for backend processing and React.js or Dash for visualization. The dashboard provides live monitoring, emotion trend analysis, and engagement insights, enabling educators to dynamically adapt assessments based on student responses. The system also incorporates data logging and reporting modules for long-term analysis and improvement of examination strategies. By combining computer vision, deep learning, and data visualization, this solution enhances online assessments by offering automated proctoring, engagement monitoring, and emotional feedback, ultimately improving both student experience and evaluation effectiveness.

**ABSTRACT**

**AI-Powered Calorie and Nutrition Estimation from Food Images**

With the growing emphasis on health and nutrition, AI-powered solutions have become essential for tracking dietary intake efficiently. This project proposes an AI-powered calorie and nutrition estimation system that utilizes computer vision and deep learning to analyze food images and estimate their caloric and nutritional content.

The system employs convolutional neural networks (CNNs) for food recognition and image segmentation, identifying different food items in a given image. It detects and classifies food types while integrating a food volume estimation algorithm to approximate portion sizes. A nutrient database is then used to correlate recognized food items with their caloric values, macronutrients (carbohydrates, proteins, fats), and micronutrients.

To enhance user interaction, the system is developed as a web-based application, leveraging Flask/Django for backend processing and React.js or Flutter for UI development. The application allows users to upload food images, view detailed nutritional breakdowns, and track their daily intake.

This solution provides an efficient and automated approach to dietary tracking, assisting users in maintaining balanced nutrition and supporting healthcare professionals, dietitians, and fitness enthusiasts in monitoring dietary habits effectively by displaying a structured output with food names, portion sizes, and total calorie count.

## RP3001

### स्वरभावनाश्लेष" (Svarabhāvanāśleṣa)

Speech-Based Emotion Recognition

#### Problem Statement:

In psychiatry, understanding a patient's emotional state is essential for accurate diagnosis, tracking progress, and tailoring treatments. Currently, psychiatrists rely heavily on interviews, self-reports, and observations to gauge emotions, but these methods come with their own challenges:

- **Subjectivity:** Emotions are often under-reported or misrepresented due to stigma, fear, or a lack of self-awareness.
- **Time-Consuming:** Analyzing emotional states manually during or after sessions can be time-intensive, delaying important insights.
- **Inconsistency:** Different clinicians may interpret emotional cues in various ways, leading to potential biases and diagnostic discrepancies.

For patients dealing with conditions like depression, anxiety, PTSD, or bipolar disorder, recognizing emotional patterns is crucial for timely interventions. Yet, there is no standardized tool available to provide psychiatrists with real-time, objective emotional feedback, making it harder to make quick, informed decisions.

## RP3002

## Building a chatbot for your college using RAG

#### Objective: Defining the Problem Statement

The main problem is the inefficiency in accessing college-related information, such as course details, faculty contacts, event schedules, library resources, and administrative processes. Students, faculty, and visitors may struggle to find quick and accurate answers due to fragmented resources and communication bottlenecks.

#### Problem Statement:

With the increasing demand for instant and accurate information, chatbots have become essential tools in educational institutions. This project focuses on building a college chatbot using Transformers to assist students with queries related to admissions, courses, faculty, exams, placements, and campus facilities.

The chatbot leverages Retrieval-Augmented Generation (RAG), which combines information retrieval with a large language model (LLM) for precise responses. First, college-related documents (FAQs, syllabi, notices) are processed, chunked, and converted into vector embeddings using models like BERT or SBERT. These embeddings are stored in a vector database (FAISS or ChromaDB) for efficient retrieval. When a student asks a query, the chatbot retrieves the most relevant information and generates a response using a Transformer-based model such as GPT-4, Llama 2, or T5.

This project demonstrates the power of Transformer models in Natural Language Processing (NLP) and their ability to provide accurate, context-aware answers in an educational setting. By implementing a chatbot using Transformers, colleges can improve student engagement, reduce administrative workload, and enhance information accessibility.

# RP4001

## Real Time Research Project LIST (AY 2025-2026)

### Project 1: Research Paper Summarizations using RAG Model

#### **Tech Stack:**

**Front end:** ReactJS with Bootstrap or Tailwind CSS

**Back end :** Python with Flask with Routing

**Model :** RAG, Chroma DB, Basic understanding T5 Architecture(Encoder-Decoder)

**Database:** cloud MongoDB

**Additionally:** Langchain Framework

#### **Overview:**

An Agent Helps to summarise the paper provided by the user while prompting the Query.

1. We will supply Research Paper in PDF/Docx Format
2. Now that file moves to a RAG Model to train data.
3. To improve Performance then fine-tune data can be done by training the model on a smaller, specialized dataset.
4. LLM has to provide 250 words of complete summarization of documents with at least 2 advantages & Disadvantages.
5. Additionally we can give a prompt **Q&A** for particular keywords/ topic/additional info/ etc and receive answers in prompt through LLM trained data.
6. Some situations you need to conversational memory to store previous prompts

#### **Outcome:**

1. You'll get **Summarizations** of paper listed with at least two advantages & disadvantages..
2. You'll get **Q&A** topic for further discussion.
3. You'll learn how to use **RAG-T5** Transformers & Implementation.]
4. You'll learn how to train your private data with the RAG Model.
5. You'll build Entire Application with React JS more over CSS Beautification, backend python.
6. Additionally You'll learn Basic Keywords like FAISS, langchain, Vector store, api keys, etc.

## RP4002

+ -	<div data-bbox="705 367 865 389">⋮ ≡ +</div> <b>Project 2:</b> Generate SEO Keywords by analysing video
	<p><b>Tech Stack:</b> <b>Front end:</b> ReactJS with Bootstrap or Tailwind CSS moreover FAST API <b>Back end :</b> Python with Flask with Routing <b>Model:</b> BART(Encoder Only) <b>Database:</b> Cloud MongoDB <b>Additionally:</b> Transformers, SpeechRecognition, LLama3-7b model, Hugging face</p>
	<p><b>Overview:</b> In this project, students have to do the following Task</p> <ol style="list-style-type: none"><li>1. Already Existing Video, Extract the text from video</li><li>2. After Extracting Video Description, you need to analyze the data</li><li>3. Now you need to generate AI SEO-optimized descriptions with relevant keywords, hashtags, and links.</li><li>4. If User wants to upload a video into Youtube, Our AI suggests keywords/hashtags should be visible &amp; Listed in SEO rankings.</li><li>5. Now User has to choose a Button called <b>HOSTING</b>, then from our Web App you can navigate to Youtube login, where you can directly post the above video with SEO Tagging.</li><li>6. Finally you need to capture the data who subscribes /like /share your video monitor into our application &amp; You will get alerts through whatsapp notification.</li><li>7. Additionally we can create a certificate banner for Reaching Milestone for End Users.</li></ol> <p><b>Outcome:</b></p> <ol style="list-style-type: none"><li>1. You'll get, how SEO Ranking will analyze</li><li>2. You'll get know, how to use API key</li><li>3. You'll able to build Keywords for a particular topic.</li><li>4. You'll build chatbot with React JS more over CSS Beautification, backend python</li></ol> <p>Our tool/webapp as to Generate SEO Keywords for SEO rankings, JustLike vidiQ</p> <p><b>Note:</b> Keyword Analysis Process For SEO, You can watch below Template for Traffic Analysis</p> <p><b>Reference:</b> <a href="https://youtu.be/O5WyXoVI0i8">https://youtu.be/O5WyXoVI0i8</a></p>

**Title : Anomaly Detection in Industrial Environments Using Synthetic Data  
and Transformer Models**

**Abstract:**

In industrial environments, efficient and accurate defect detection is critical for ensuring product quality and minimizing downtime. This project focuses on leveraging synthetic data augmentation and advanced Transformer-based models to revolutionize defect detection systems. Synthetic defect data will be generated using state-of-the-art generative models, such as GANs or Diffusion Models, to simulate diverse defect types and overcome the limitations of insufficient real-world data. A Transformer-based approach, known for its superior attention mechanisms and contextual understanding, will be implemented to detect and classify defects with high precision. Additionally, a user-friendly visualization interface will be developed to provide real-time insights into defect locations, classifications, and patterns, enabling proactive decision-making. This system aims to improve the robustness and scalability of defect detection processes, offering a cutting-edge solution tailored to meet the demands of modern industrial settings.

# RP5002

## **AUTOMATED INTERVIEW QUESTION GENERATOR**

### **ABSTRACT**

The Automated Interview Question Generator is an advanced tool designed to enhance the recruitment process by generating customized interview questions based on job descriptions and candidate profiles. A key feature of this system is its ability to accept direct resume uploads in various formats (PDF, DOCX, etc.), enabling seamless data extraction for question generation.

The tool comprises several modules: a Landing Page (Dashboard) for easy navigation, a Create New Interview (Form Page) for collecting job-specific details, and a Results Page to display, review, and export the generated questions. Inputs include the Job Description, Uploaded Candidate Resume, Competency Requirements, Experience Level, and Interview Type.

Using these inputs, the system produces s question sets, categorized into Technical, Behavioral, Situational, and Competency-based questions, with varying difficulty levels (Easy, Medium, Hard). It also suggests follow-up questions based on candidate profiles.

Additional features include template management, multi-format export options (PDF, Word, CSV), and collaboration tools for sharing question sets. The user interface is designed for simplicity, responsiveness, and accessibility, ensuring an intuitive experience across devices.

This tool significantly improves hiring efficiency by automating the creation of role-specific, competency-driven interview questions, reducing manual effort for HR professionals while ensuring comprehensive candidate assessment.



# RP6001

## Faculty Data Management System (FDMS)

### Abstract

The **Faculty Data Management System (FDMS)** is a comprehensive web-based platform designed to streamline the collection, management, and reporting of faculty-related data in educational institutions. This system specifically caters to the requirements of **NAAC (National Assessment and Accreditation Council)** and **NBA (National Board of Accreditation)**, ensuring that institutions maintain the highest standards in faculty development, research, and teaching.

The FDMS facilitates the creation and maintenance of detailed faculty profiles, which include personal information, academic qualifications, professional experience, research activities, and participation in faculty development programs. It allows administrators to manage faculty assignments, track teaching loads, and assess faculty performance through student feedback and peer reviews. Additionally, the system enables seamless reporting on various accreditation criteria, ensuring compliance with NAAC and NBA's specific guidelines for faculty qualifications, research output, and continuous professional development.

**RP6002**

**3D Campus Tour:**

**Abstract**

The 3D Virtual Campus Tour project aims to provide an interactive and immersive online experience for users to explore a college campus remotely. By leveraging technologies like Three.js, WebGL, and HTML/CSS/JavaScript, the project creates a 3D model of the campus, featuring clickable hotspots, information popups, and 360-degree views of key areas such as classrooms, libraries, and recreational spaces. This virtual tour addresses the needs of prospective students, remote learners, and visitors who cannot physically visit the campus. It offers an engaging way to explore the campus, aiding in decision-making for prospective students and helping current students navigate the campus. The project will be optimized for various devices and accessible through modern web browsers, providing a seamless user experience.

**RP7001**

## **Requirement Specification Document for Asset Management System (AMS)**

**Title:**

**"Development of an Asset Management System for existing assets"**

**Problem Statement:**

The purpose of this document is to define the system requirements for the Asset Management System (AMS). This system will allow organizations to efficiently track, manage, and maintain assets, such as laptops, printers, scanners, projectors, mouse, keyboard, headset etc. The AMS will ensure that assets are properly tracked, scheduled for maintenance, and disposed of when no longer needed.

Requests are aggregated, centrally processed, assets are distributed through the common store, with asset tagging and tracking to final issuance. Reports are generated for various purposes, like total assets, or/and for a specific department etc, in AMC or end of service assets etc.

For each item a QR code is attached and stored in the DB as a line item. If the item is not working then scan the QR code to report the problem. This scanning and reporting is done via a mobile app.

**RP7002**

## **“Attendance Tracker” - A Web Application**

### **Abstract:-**

Traditional classroom monitoring methods lack the ability to provide objective, scalable, and real-time insights into student engagement, particularly in large or virtual settings. Educators often face challenges in detecting signs of inattention, such as closed eyes or distracted behavior, making it difficult to implement timely interventions and optimize classroom effectiveness. This highlights the need for a technology-driven solution capable of automating engagement tracking, offering actionable insights, and enriching the learning experience for both students and teachers.

**RP8001**

## **Inclusive Gesture Recognition System using IOT and ML**

### **Problem Statement**

The challenge is to develop a system that allows intuitive and seamless interaction between humans and machines using hand gestures. This system should be capable of recognizing various hand gestures and translating them into commands that can control IoT devices or applications through a web or mobile interface.

### **Use Cases**

1. Inclusive Gesture Recognition System for Translating Sign Language into Spoken Language for Specially Abled Individuals
2. IOT & WebApp Integrated Hastamudra Gativigynana System for Smart Home Automation and Control.

## RP8002

### IOT BASED AUTOMATED HEALTHCARE

#### Problem Statement

The challenge is to develop a system that enables continuous, real-time monitoring of patients' health, with a particular focus on heart monitoring, to provide timely interventions and improve healthcare outcomes. Traditional healthcare models often fall short in providing round-the-clock care, necessitating a solution that leverages advanced technology to bridge this gap.

#### Features

1. **Real-Time Health Monitoring:** Continuous tracking of vital signs such as heart rate, blood pressure, glucose levels, temperature, and oxygen saturation.
2. **Heart Monitoring:** Advanced heart rate and ECG monitoring to detect arrhythmias and other cardiac conditions.
3. **Predictive Analytics:** Use of machine learning algorithms to analyze health data and predict potential health issues before they become critical.
4. **Remote Accessibility:** Healthcare providers can access patient data remotely via a user-friendly interface, enabling timely interventions.
5. **Alerts and Notifications:** Automated alerts for healthcare providers when critical deviations from baseline health parameters are detected.
6. **Security Measures:** Ensuring patient data privacy and compliance with regulatory standards.
7. **User-Friendly Interface:** Mobile and web applications for patients and caregivers to monitor health trends and receive updates.

## RP8003

### IOT & WebApp based remote field monitoring and control operations

#### Problem Statement

Farmers face numerous challenges in managing their fields, such as optimizing irrigation, monitoring soil conditions, and ensuring the health of their crops. Traditional farming practices often require significant manual labor and can be inefficient. The challenge is to develop an IoT and web app-based system that enables farmers to remotely monitor and control field operations, leading to increased efficiency and improved crop yields.

#### Features

1. **Soil Moisture Monitoring:** Real-time monitoring of soil moisture levels to optimize irrigation.
2. **Weather Tracking:** Integration with weather data to provide farmers with insights for better decision-making.
3. **Crop Health Monitoring:** Use of sensors and cameras to detect plant diseases and pest infestations early.
4. **Irrigation Control:** Remote control of irrigation systems based on real-time data.
5. **Automated Alerts:** Notifications for abnormal conditions such as low soil moisture, extreme temperatures, or pest detection.
6. **Data Analytics:** Analysis of collected data to provide insights and recommendations for improving crop yield.
7. **User-Friendly Interface:** An intuitive web app for farmers to easily monitor and control their fields from anywhere.
8. **Scalability:** Ability to monitor and control multiple fields from a single platform.
9. **Security:** Ensuring data privacy and security for all transmitted information.

## RP9001

### "Care Lock: Empowering Elderly Care with AI and IoT Integration"

The "Care Lock: Empowering Elderly Care with AI and IoT Integration" project sounds like an innovative initiative aimed at improving the quality of life for elderly individuals using cutting-edge technologies. Here's how the project might be structured and its potential features:

#### **Abstract:**

The increasing global aging population has spurred the demand for innovative solutions in elderly care. "Care Lock" represents an advanced system that integrates Artificial Intelligence (AI) and the Internet of Things (IoT) to enhance elderly care by providing safety, health monitoring, and assistance with daily activities. This platform utilizes a network of interconnected devices such as smart wearables, sensors, and home automation systems to collect real-time data on the individual's health, behavior, and environment. AI algorithms process this data to detect patterns, predict health risks, and trigger alerts for caregivers or medical professionals in case of emergencies. Care Lock also includes smart locks, voice assistants, and personalized reminders to support the elderly in maintaining independence while ensuring their well-being. This synergy of AI and IoT aims to reduce the physical and emotional burdens on caregivers while providing a safer, more comfortable living environment for the elderly, ultimately enhancing the quality of life for this growing demographic.

## RP9002

### **AI-Powered Home Security System Using IoT and Cloud**

#### **Problem Statement**

Home security is a critical concern for homeowners, especially with the increasing number of burglaries and unauthorized intrusions. Traditional security systems are often expensive, lack real-time monitoring, and cannot differentiate between authorized and unauthorized individuals. Additionally, they rely heavily on human intervention for monitoring and decision-making, which can lead to delays and errors.

To address these challenges, there is a need for an **intelligent, cost-effective, and automated home security system** that leverages **IoT, AI, and Cloud technologies** to:

1. Detects intruders in real-time.
2. Differentiate between authorized and unauthorized individuals using facial recognition.
3. Send instant alerts to homeowners.
4. Store video footage securely in the cloud for future reference.
5. Provide remote monitoring capabilities via a mobile app or web dashboard.