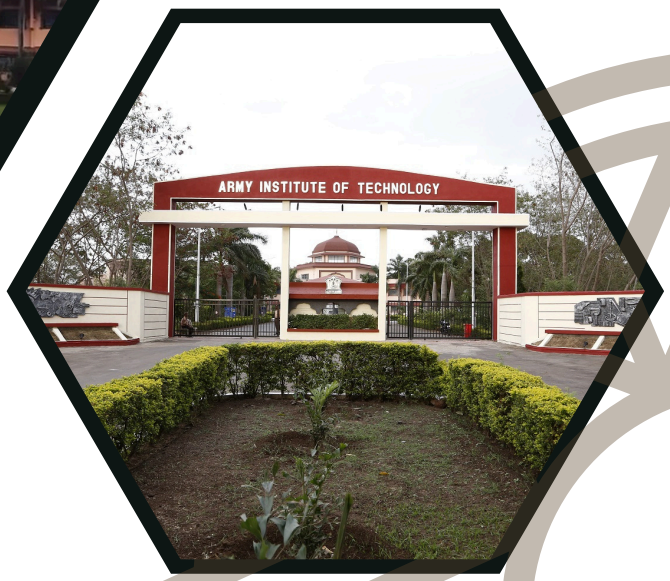
ONWARD TO GLORY

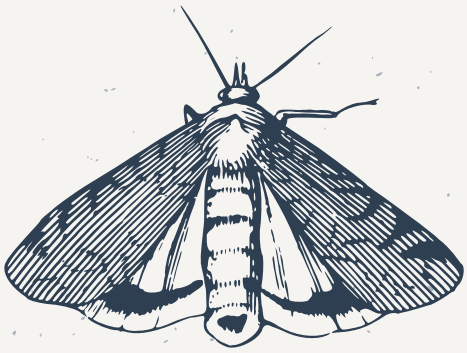
AWES

TRUTH IS GOD



DEPARTMENT OF INFORMATION TECHNOLOGY

2023-24



TECHNICAL E-MAGAZINE

2023-2024

VISION

“To become a "Globally Recognised" technical institute providing world class education and research facilities to the wards of Defence personnel.”

MISION

(a) Provide the right environment, to the wards of Defence personnel, for development of physical, intellectual, emotional and spiritual quotients, with a view to produce total quality engineers.

(b) Create an ecosystem which can foster the culture of research, innovation, creative thinking and higher studies.

(c) Develop an education system which creates entrepreneurs and technology leaders who are committed towards sustainable development of society and nation building.

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Guide: Dr. Sangeeta Jadhav

Title:

"MACHINE HEALTH PREDICTION USING FOG COMPUTING."

ABSTRACT

In the era of Industry 4.0, ensuring the optimal functionality and longevity of machines is paramount for sustained operational efficiency and cost-effectiveness. We present a comprehensive exploration of machine health monitoring leveraging fog computing techniques, with a particular emphasis on predictive maintenance through temperature parameter analysis. In an interconnected ecosystem where machines form the backbone of industrial operations, the ability to foresee and preemptively address potential faults and failures is indispensable. By scrutinizing the dynamic landscape of fog computing in the context of predictive maintenance, this paper offers a meticulous overview of the latest advancements and methodologies. It delves into the intricacies of temperature parameter analysis as a cornerstone for predictive maintenance strategies, elucidating its significance in detecting anomalies and predicting potential breakdowns. Furthermore, this paper not only delineates the current state-of-the-art in machine health monitoring but also identifies emerging trends, thereby empowering researchers, and industry practitioners to stay abreast of evolving methodologies and technologies. With a focus on bridging the gap between theoretical concepts and practical implementation, this paper serves as a valuable resource for stakeholders aiming to enhance the reliability, efficiency, and longevity of industrial machinery. By fostering a deeper understanding of predictive maintenance through temperature parameter analysis within the framework of fog computing, this paper equips stakeholders with the knowledge and insights necessary to develop proactive and efficient strategies for machine health monitoring in the industry 4.0 landscape.

2| Hardeep Singh, Pankaj Kumar, Sachin Poonia

Guide: Dr. Sangeeta Jadhav

Title:

"LEAF DISEASE DETECTION USING MACHINE LEARNING."

ABSTRACT

The project presents plant disease detection using image processing techniques for automated vision system used at agricultural field. In agriculture research automatic plant .

3| Akash Rawat, Atulay Latiyan, Yatin Verma, Annanya Katoch

Guide: Prof D.G.Auradkar

Title:

"PNEUMONIA DETECTION WITH XRAY IMAGE USING CONVOLUTION NEURAL NETWORKS."

ABSTRACT

Pneumonia is a respiratory infection caused by bacteria or viruses that impacts numerous indivisuals,particularly in devoloping and undevolopment nations where high levels of pollution,unsanitary living conditons and overcrowding are prevalent coupled with inadequate medical infrastructure.Pneumonia leads to pleural effusion,a condition where the lungs are filled with fluids,resulting in breathing difficulties.Early detection of pneumonia is crucial for effective treatement and improved survival rates.Chest X-ray imaging is the most commonly used method for diagnosing pneumonia.However interpreating chest X-ray is a complex task and is susceptible to subjective interpreation.In this project we will devolope computer assisted diagnostic system for automatic pneumonia detection using chest X-ray images.We will utilize deep transfer learning to adress the limited availability of data and devised an ensemble of three convolutional neural network models:GoogLeNet,ResNet-18 and DenseNet-121

4| Akash Singh, Dipankar Kr. Singh, Himanshu Yadav

Guide: Dr. Rahul Desai

Title:

"ANOMALY DETECTION IN MULTIVARIATE TIME SERIES DATA USING TRANSFORMER NETWORK."

ABSTRACT

Anomaly detection is the identification of unusual trends and patterns or occurrences within data which deviate from established norms. As data volumes increase, manual tracking becomes impractical, necessitating automated methods to prevent harm to systems by identifying potential threats or irregularities before they manifest. In scenarios like a hospital's cybersecurity, predictability enables rule creation to thwart attacks, safeguard sensitive data, and secure the overall environment.

Detecting anomalies in multivariate time-series data poses challenges due to factors like the absence of clearly labeled anomalies, inherent data unpredictability and fluctuations, and the demand for ultra-fast inference times in contemporary applications. Although deep learning techniques have seen advancements in anomaly detection, only a limited few effectively address these complex issues.

The described project introduces an anomaly detection and diagnostic model utilizing a deep transformer network. This model harnesses attention based sequential encoders and decoders that swiftly conduct inference while considering the broader local or temporal patterns present in the continuous data.

In summary, the project addresses the need for efficient and accurate detection of anomaly in high dimensional time-series data by employing a deep transformer network with attention-based encoders. The model aims to overcome challenges such as the absence of labeled anomalies, inherent data unpredictability, and the demand for rapid inference in modern applications.

5| Adarsh Diwakar, Aditya Vikram Parihar, Girvar Singh, Muskan

Guide: Dr. Rahul Desai

Title:

"YOUTUBE COMMENT EXTRACTION AND SENTIMENTS ANALYSIS."

ABSTRACT

Online platforms, particularly YouTube, have become significant hubs for user-generated content and community interactions. This paper presents a comprehensive analysis of sentiments expressed in YouTube comments, employing natural language processing techniques for sentiment categorization. The study leverages the YouTube Data API to extract comments from a diverse range of videos. Sentiment analysis, utilizing the library in Flask, provides insights into the nuanced expressions within user comments, spanning from positive and supportive to negative and critical sentiments. The research aims to contribute to a deeper understanding of user engagement, content impact, and community dynamics within the YouTube platform. The findings are instrumental for content creators, platform administrators, and researchers, offering actionable insights to enhance user experience, foster positive online communities, and refine content strategies. The study acknowledges limitations and suggests future directions for research, emphasizing the ongoing evolution of online communication and the need for adaptive sentiment analysis methodologies. The ever-expanding volume of textual information has paved the way for extensive research in the realms of machine learning (ML) and natural language processing (NLP). A particularly intriguing area of study in recent times is sentiment analysis of YouTube comments. Despite the abundance of user comments and reviews on many videos, extracting meaningful trends from these comments has proven challenging due to their inconsistent information quality. This paper delves into sentiment analysis on YouTube comments related to popular topics using various machine learning techniques and algorithms. Our aim is to showcase that analyzing sentiments can unveil trends, seasonality, and forecasts, offering a transparent depiction of how real-world events influence public sentiments.

6 J Girish, Sumrender Singh, Ankit Agnihotri, Abhishek Kumar

Guide: Dr. Ashwini Sapkal

Title:

"DECENTALISED VOTING SYSTEM USING HOMOMORPHIC ENCRYPTION FOR VOTER PRIVACY."

ABSTRACT

In contemporary discourse, there's a growing emphasis on establishing trustworthy voting mechanisms, both in academic research and industrial applications. Numerous scholars are dedicated to crafting voting systems with heightened security and dependability. However, prevalent blockchain-based solutions encounter various challenges, including restricted participant pools, weak fault-tolerance mechanisms, and inadequate privacy measures, hindering their practical viability.

To overcome these obstacles, this study introduces an innovative blockchain-based self-tallying voting protocol, with the aim of enhancing availability, security, and anonymity in the voting process. The protocol employs threshold secret sharing to address the abstention issue, a significant concern in self-tallying voting systems. Additionally, it utilizes homomorphic encryption and zero-knowledge proof techniques to ensure the anonymity and verifiability of encrypted data.

Through rigorous analysis, performance testing, and comparison with similar existing proposals, the results showcase the superior security and robustness of our protocol. Furthermore, performance tests confirm the feasibility and scalability of our approach. By introducing this pioneering blockchain-based self-tallying voting protocol, our objective is to contribute to the advancement of secure and reliable voting systems, mitigating the limitations observed in current approaches.

In achieving this, we anticipate fostering greater trust and participation in democratic processes, thereby strengthening the foundation of governance. Continuous refinement and adaptation based on real-world feedback will ensure the protocol remains responsive to evolving needs and challenges in the voting landscape. In achieving this, we anticipate fostering greater trust and participation in democratic processes, thereby strengthening the foundation of governance. Continuous refinement and adaptation based on real-world feedback will ensure the protocol remains responsive to evolving needs and challenges in the voting landscape.

7| Abhinab Singh, Bhaumik Maan, Piyush Yadav, Rahul Lamba

Guide: Dr. Ashwini Sapkal

Title:

"RATINAL IMAGE SEGMENTATION USING GRAPH NEURAL NETWORK."

ABSTRACT

Diabetic retinopathy (DR) stands as a leading global cause of blindness, necessitating labor-intensive manual examinations of fundus images for accurate diagnosis. Despite the potential of convolutional neural networks (CNNs) in automating DR diagnosis, these models often struggle to retain critical information, leading to suboptimal diagnostic performance. Our project addresses this pressing need by developing an innovative automated diagnostic system that employs Graph Neural Networks (GNNs) for precise detection and grading of DR based on fundus images.

The urgency to prevent DR-related blindness and the significance of early intervention in halting disease progression underpin our initiative. We aim to alleviate visual impairments and complications arising from DR through this advanced diagnostic tool. Our primary goals are to enhance lesion representation, achieve accurate multi-lesion detection and classification, and ensure robust performance across diverse datasets. By pioneering the application of GNNs in DR diagnosis, our system aims to revolutionize early detection and management of the disease. Unlike traditional CNN-based approaches, GNNs excel at capturing complex relational data, making them particularly suited for medical imaging tasks where the spatial relationships between lesions are crucial. This project redefines DR classification as a multilabel detection and classification task, significantly improving diagnostic precision. Our proposed system promises to be a significant advancement in the field of DR diagnosis and severity grading. By enhancing the accuracy and efficiency of DR detection, we anticipate a marked improvement in patient outcomes. Early and precise diagnosis facilitated by our system can substantially reduce the risk of vision loss in diabetic individuals, ultimately contributing to the broader medical community's efforts to combat DR and elevate patient care. In conclusion, our GNN-based diagnostic system represents a pivotal development in medical AI, with the potential to transform DR diagnosis and management, thereby significantly benefiting patients and healthcare providers worldwide.

8| Prince Kapare, Shubham Kumar, Prince Patel, Prena Yadav

Guide: Prof Vaishali Ingale

Title:

"HEALTHCARE DATA SECURITY WITH ATTRIBUTE BASED ENCRYPTION."

ABSTRACT

In the ever-growing demand for healthcare security management systems, it is necessary to consider the importance of security for patients and their data. It can help in the progressing world of healthcare administration platform, maintaining privacy, secrecy, and Secure Electronic Health Record Access (EHRs) has become of prime importance. Traditional encryption methods require many software keys, which makes limiting access difficult uncomfortable, and highly inefficient. This project offers a clever solution to this problem by integrating "Ciphertext-Policy Attribute-Based Encryption (CP-ABE)" to provide fine-grained access control with minimal discrete keys.

This project revolves around the idea of making a novel access control model which can employ around 6-7 attributes to manipulate and regulate the revolving of healthcare records. The method used in the model is CP-ABE. CP-ABE provides patients with policies and procedures to encrypt EHRs, giving access to right and valid users that are based on their accreditation, for example, on roles, qualifications, or affiliations. This fine-grained access control, besides the fact that it enriches security and also makes certain that patient data is revolved or shared with precision and compliance with privacy principles.

9| Tarun Mishra, Sambhav Kumar, Vinay, Harshit Pandey

Guide: Prof Vaishali Ingale

Title:

“DEEP FAKE DETECTION IN VISUAL MEDIA.”

ABSTRACT

Deepfakes pose a significant threat to our perception of truth and call for the development of effective detection strategies. They pose increasing risks to privacy, social stability, and democratic processes. Deepfake detection is essential for safeguarding authenticity and integrity across digital media platforms, ensuring trust and reliability in content dissemination. This project aims to develop an automated deepfake detection system using image processing techniques and deep learning models. Deepfake video utilizes deep learning to proxy someone’s face, speech, or emotion with the face, speech, or emotion of another person. A neural network-based methodology utilizing video frame extraction approach used to detect fabricated. Two different approaches, utilizing Generative Adversarial Networks (GAN) and a combination of ResNeXt feature extraction with Long Short-Term Memory (LSTM) video classification, are employed and assessed for their efficacy in deepfake detection.

10 | Kanchan Malik, Gavara Sanjana, Mohit Singh, Gaurav Kumar

Guide: Dr. Gajanan Walunjkar

Title:

"PREDECTIVE MANTAINANCE OF INDUSTRIAL EQUIPMENT USING TRANSFORMER ENDODER."

ABSTRACT

The pursuit of accurate Remaining Useful Life (RUL) prediction, crucial for anticipating device failure, has intensified among researchers. This paper addresses the limitations of existing RUL prediction methods by introducing the STSF (Spatial-Temporal Homogeneous Feature Extractor) model. STSF employs a flexible layer-wise progressive feature fusion technique to ensure homogeneity of spatial-temporal features, thereby enhancing prediction accuracy. Additionally, the Feature Space Global Relationship Invariance (FSGRI) training method, based on supervised contrastive learning, is introduced to maintain consistent relationships among sample features and degradation patterns during model training. This simplifies subsequent regression tasks and improves RUL prediction performance. Comparative analysis on the C-MAPSS dataset demonstrates the superiority of the STSF model across various metrics.

11 | Abhishek Rai, Aditya Verma, Gulvinder Chauhan, Swaraj Nayak

Guide: Prof Yuvraj Gholap

Title:

“BUILDING LLM'S FINE TUNING MARKUPS USING LDA, TOPIC MODELING APPROACH.”

ABSTRACT

In today's fast-paced digital landscape, where information overflow is the norm, navigating through diverse documents like PDFs or Word files poses a considerable challenge in uncovering specific insights. Enter the finely tuned Large Language Model (LLM), a gamechanger in how we engage with personal content. Seamlessly blending natural language processing and machine learning, our Fine-Tuned Chatbot stands as a powerful conversational interface, adept at extracting information from a variety of personal files. Yet, amidst this technological advancement, a noteworthy hurdle emerges during the finetuning of personal data—manual creation of conversational turns, a time-consuming task. To tackle this challenge head-on, we've devised an innovative approach, leveraging topic modeling methods, specifically Latent Dirichlet Allocation (LDA), to swiftly generate these conversational turns.

The heart of our solution lies in the efficient automation of conversational turns. Instead of investing valuable time manually crafting these turns, our approach utilizes LDA to identify key topics within the personal data. This allows for the automatic generation of conversational snippets, significantly reducing the time and effort required in the preprocessing phase. As a result, the Fine-Tuned Chatbot can be trained more rapidly, ensuring a quicker deployment for businesses seeking enhanced data extraction capabilities.

12 | Archana Kumari, Khushbu, Monika, Sushmita Singh

Guide: Prof Sandeep Samleti

Title:

"HAND GESTUNE RECOGNITION USING DEEP LEARNING."

ABSTRACT

In this comprehensive project, we embark on the development of a cutting-edge Hand Gesture Recognition App, leveraging deep learning methodologies to facilitate sign language generation. The initial phase revolves around meticulous data preparation, wherein a diverse dataset of 20,000 hand gesture images is curated. This dataset undergoes a sophisticated preprocessing pipeline, incorporating a Gaussian skin color model for enhanced hand segmentation and the extraction of HAAR features to capture nuanced patterns. Subsequently, the dataset is partitioned into training and testing sets, laying the foundation for robust model development. The second phase focuses on the implementation of a Convolutional Neural Network (CNN) model, meticulously designed to encapsulate intricate layers, filters, and activation functions. The model is trained using the preprocessed dataset, and its efficacy is rigorously evaluated using a separate testing dataset. To augment the model's accuracy, an AdaBoost classifier is introduced, creating a synergistic fusion that transcends the capabilities of a standalone CNN. Moving forward, the optimization phase is dedicated to refining the model for real-time hand gesture recognition. Fine-tuning of hyperparameters ensues, accompanied by extensive testing with additional datasets to fortify the model's robustness. The final trained model is then integrated into a user-friendly Hand Gesture Recognition App, complete with an intuitive interface and real-time recognition capabilities. The testing and validation phase ensures the reliability and accuracy of the entire system, encompassing diverse scenarios and lighting conditions. User feedback is actively solicited and utilized for continual improvements. A meticulous documentation and reporting process encapsulates dataset details, preprocessing intricacies, model architecture, and a comprehensive summary of results, including accuracy, loss metrics, and observed challenges. The deployment phase signifies the culmination of the project, as the Hand Gesture Recognition App is introduced to the public domain. The choice of an appropriate deployment platform, such as mobile app stores or web applications, is carefully considered. The scalability and responsiveness of the app are scrutinized, with ongoing monitoring mechanisms in place to promptly address any issues and facilitate continuous updates. In essence, this project not only presents a state-of-the-art technological solution for hand gesture recognition but also underscores the iterative nature of development, with a commitment to user-centric design, optimization, and perpetual enhancement.

13 | Rohit Sharma, Ankit Kumar, Arun Kumar, Nooka Praveen

Guide: Dr. Rupali Bagate

Title:

"ENSEMBLE APPROACH FOR MULTIMEDIA TAMPERING DETECTION USING YOLO."

ABSTRACT

Forgery or picture manipulation has become a common problem in digital image processing. The availability of image editing software has made it simpler for people to alter images for a variety of goals in recent years, such as disseminating false information, tampering with evidence, or modifying personal photos. To identify any unwanted changes made to the image, there is a requirement for an effective image tempering detection model. In this project, we provide a revolutionary deep learning-based image tempering detection algorithm that can identify tampered regions in photos. We tested the suggested model on the Columbia dataset, which is a dataset that contains picture manipulation. The findings demonstrate that our suggested model performs at the cutting edge when it comes to accuracy, precision, recall, and F1-score. Additionally, we used real-world photos to test the model. All things considered, our suggested technique for identifying image tempering offers a trustworthy and effective way to find any illegal changes made to photographs. Applications for the model include media forensics, authentication systems, and forensic investigations. Using YOLO, we present an ensemble strategy for detecting multimedia tampering. YOLO (You Only Look Once) is a cutting-edge object identification method that has been demonstrated to be useful for a wide range of tasks, including picture and video tampering detection. The strengths of many YOLO models, each trained on a distinct sort of tampering artefact, are combined in our ensemble technique. This enables our technology to outperform previous methods in terms of accuracy and robustness. On a benchmark dataset of modified photos and videos, we test our ensemble technique. Our methodology beats standard methods in terms of accuracy, precision, and recall, according to the results. We also demonstrate that our strategy is more resistant to various tampering techniques.

14 | Rishabh Rawat, Sayanya Mondal, Shivangi Kotnala, Veram Bhavana

Guide: Prof Sandeep Samleti

Title:

“RECIPE ADVISOR BASED ON THE INGRADIENTS IMAGES USING DEEP LEARNING.”

ABSTRACT

Frequently, we find ourselves in the predicament of craving a scrumptious meal yet facing a shortage of essential ingredients at home. This situation often leads to perplexity regarding what culinary creation can be conjured with the limited supplies on hand. Moreover, the accessibility to additional ingredients from nearby markets might be restricted due to various reasons, such as unavailability or the challenging circumstances experienced during unprecedented events like the Covid pandemic, resulting in closures and limitations. Consequently, we are confined to our homes, tasked with the challenge of crafting the most delectable dish possible from the remnants of our pantry. Our initiative strives to enlighten users about the multitude of dishes that can be prepared using the set of available ingredients provided by the user, offering solutions for creating a satisfying meal despite the limitations.

15 | Ujjwal Singh, Abhishek Jakhar, Deepak Yadav, Himanshu

Guide: Dr. Dipika Birari

Title:

"YOGA POSE DETECTION AND CORRECTION USING CNN."

ABSTRACT

This report presents a study on yoga pose detection using Convolutional Neural Networks (CNN) and PoseNet. The objective is to develop an efficient system for recognizing and classifying various yoga poses from images or video streams. CNNs are employed for their robust feature extraction capabilities, enabling the identification of intricate details in yoga postures. PoseNet, a neural network that estimates human poses, is integrated to enhance the accuracy of pose detection by providing key point localization. The combination of CNN and PoseNet allows for precise and real-time identification of yoga poses, facilitating applications in virtual yoga classes, fitness tracking, and automated feedback systems. Experimental results demonstrate the effectiveness of the proposed method, showcasing high accuracy and real-time performance. This approach promises to improve user experience in digital fitness platforms by providing reliable and instant feedback on yoga postures.

16 | Amit Sharma, K C Varshit, Popinder Singh, Satyam Singh

Guide: Dr. Gajanan Walunjkar

Title:

"CREDIT CARD FRAUD DETECTION BY USING INTEGRATED APPROACH OF ML AND BLOCKCHAIN."

ABSTRACT

Credit card fraud has become an increasingly significant issue in the digital age, as the convenience of online transactions and the widespread adoption of credit cards have given rise to sophisticated fraudulent activities. Financial institutions and consumers face substantial economic losses due to fraudulent transactions. According to recent reports, global credit card fraud losses reached billions of dollars annually, underscoring the urgent need for effective detection and prevention mechanisms. The traditional methods for fraud detection rely heavily on rule-based systems and manual reviews. While these methods have been somewhat effective, they are often reactive, slow, and unable to adapt quickly to the evolving tactics of fraudsters. This necessitates the development of more advanced and proactive solutions to safeguard financial transactions and protect consumer interests. Machine learning (ML) has emerged as a powerful tool in the fight against credit card fraud. By leveraging vast amounts of transaction data, ML algorithms can learn patterns indicative of fraudulent behavior and detect anomalies in real-time. Among the various ML techniques, linear regression is a fundamental method that, despite its simplicity, offers valuable insights into the relationship between transaction variables and the likelihood of fraud. Linear regression models are typically used for regression tasks; however, their extension and adaptation to classification problems, such as fraud detection, involve transforming the problem space. By fitting a linear model to transaction data and applying appropriate thresholds, linear regression can classify transactions as legitimate or fraudulent. This approach is valued for its interpretability, ease of implementation, and scalability. Blockchain technology introduces a decentralized and immutable ledger system that enhances the security and transparency of digital transactions. By recording transactions across a distributed network of nodes, blockchain ensures that data is tamper-proof and auditable. Each block in the chain contains a cryptographic hash of the previous block, a timestamp, and transaction data, making it nearly impossible for malicious actors to alter transaction records without being detected.

PROCESSES RELATED TO PROJECT IDENTIFICATION, ALLOTMENT, CONTINUOUS MONITORING, AND EVALUATION

SEMESTER 1

- STUDENT PROJECT GROUPS WILL BE FORMED.
- STUDENT HAS TO SUBMIT PROJECT IDEAS EFFORTS ARE TAKEN TO GET MAXIMUM SPONSORSHIP PROJECT.
- INTERNAL GUIDE IS ALLOTTED TO THE PROJECT GROUP.
- REVIEW COMMITTEE OF SENIOR FACULTY IS FORMED TO ASSESS PROGRESS OF PROJECT WORK
- REVIEW 1: - SHORTLIST PROJECTS AND TO CHECK FEASIBILITY. - FINALIZE OBJECTIVES AND SCOPE OF PROJECT. - TO DISCUSS LIST OF REQUIRED HARDWARE, SOFTWARE OR OTHER EQUIPMENT FOR EXECUTING THE PROJECT, TEST ENVIRONMENT TOOLS.
- REVIEW 2 : FOR FINALIZATION OF SRS - HIGH LEVEL DESIGN ,PLANNING WITH CPM/PERT CHART.
- STUDENT SUBMITS PRELIMINARY PROJECT REPORT . APPEARS FOR UNIVERSITY EXAM (PPT PRESENTATION) EVALUATED BY EXTERNAL/INTERNAL EXAMINER .

PROCESSES RELATED TO PROJECT IDENTIFICATION, ALLOTMENT, CONTINUOUS MONITORING, AND EVALUATION

SEMESTER 2

- REVIEW 3 : FOR CHECKING THE IMPLEMENTATION STATUS

↓

- REVIEW 4 : FINAL PROJECT DEMONSTARTION AND RESULT ANALYSIS.

↓

- STUDENT PREPARE FINAL PROJECT REPORT! - APPEAR FOR UNIVERSITY EXAM (PROJECT DEMO) EVALUATED BY EXTERNAL/INTERNAL EXAMINER