



MITS

SPARK_23

CST DEPARTMENT MAGAZINE



About Us



The Department of Computer Science & Technology (CST) was established in the year 2018 and plays a vital role in producing value-based professionals to cater to the ever-challenging needs of technical excellence in the emerging areas of CST. The department offers one UG program with an intake of 60 students and the intake was enhanced to 180 seats in the year 2019. Department has adequate infrastructural facilities required for imparting high-quality education and the department is fully structured to meet the contemporary needs of the industry. Imparting high quality education is supported by well qualified and experienced faculty members with rich academic and industry exposure, who have pursued Masters/Ph.D degree from prestigious institutions like NITs, IITs, and Central Universities within India and abroad. Seminars, Workshops, and Technical Symposia are conducted in the department to keep faculty and students updated with latest developments in various technologies.



Correspondent Message



WARM GREETINGS!!

I am delighted to share that the Department of Computer Science & Technology (CST) is coming up with the Annually Technical Magazine, SPARK, to showcase important Departmental events, achievements, activities, research and patent publications, Industrial/academical Interactions, Workshops, etc. of the CST department. Artistic sketches, Articles, Creative Corner and Poetry by the CST family have been included to highlight the diverse talent present within the department.

A section on Alumni with their messages shows our desire to keep our association with ex-students of the department alive and their industry-related advice shall help in shaping the mind of budding engineers of the department. Highlights of the Placement of students in an organization of repute have been included and are indicative of the goodwill of the Institute and the Department among prospective employers.

I congratulate the editorial team for their sincere effort to make this newsletter an informative document on our CST family's activities and varied talent. The editorial team has initiated something that will continue to help and guide present and upcoming students of the Department. Personally, I feel that students of MITS are equipped to set high standards and create an environment so that they excel in their areas of interest and accordingly guide more and more students of our institution, for the future.

Best Wishes for the success and bright future of "SPARK".

**Dr. N. Vijaya Bhaskar Choudary, Ph.D.,
Secretary & Correspondent of the Academy.**



Principal Message

Warm greetings!!

I am happy to release the 2023-2024 issue of CST Department Technical Magazine –“SPARK”.

It gives me great pleasure to congratulate Students, Faculty and Staff of the CST department for the publication of the Technical Magazine – “SPARK”, enumerating the various departmental activities and achievements of our students and faculty during this semester.



Technology is changing the way people think and it is crucial to address a variety of engineering and technological challenges, as a result, significant progress has been made in the field of Computer Science and Technology by integrating knowledge, based on theoretical and practical aspects. The Department of Computer Science and Technology makes an effort to enhance this field through its research and teaching. It gives me an immense pleasure that the Department of Computer Science and Technology is releasing the Technical Magazine –“SPARK” for the year 2023-2024. The newsletter is a forum that brings out the best talent among the students and their multitalented skills which showcases their academic and extracurricular activities.

I wish the BEST OF LUCK to all the team members for the publication of SPARK.

Best Wishes ,

Principal
Dr. C. Yuvaraj



HoD's Message

Dear Readers,

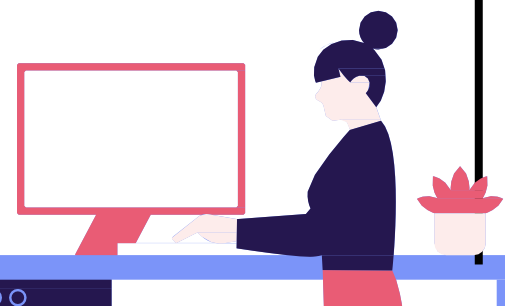
We are more than enthralled to announce the release of our Technical Magazine for the Academic Year 2023-2024.

“Little Drops of Water Make the Mighty Ocean”, a saying we witness coming true each day. Our Technical Magazine is just a droplet in the ocean that has already begun to form. This semester has been a successful one, a fact that will get lighter once you read this Technical Magazine. I would like to heartily thank all the students and faculty for putting their hearts and soul into this Technical Magazine.



The editorial team deserves a special mention for their immense hard work! This newsletter will throw light on the events held by the Department Computer Science & Technology (CST), achievements and the extra-curricular, co-curricular and academic success of the students and the faculty.

Dr. Sreedevi
Professor and HoD
Department of CST



Editorial Board

Greetings from the Editorial Board!!!

I am pleased that the Academic year 2023-2024 issue of the Departmental Technical Magazine _ SPARK is now ready to roll out with good coverage of the news that pertains to the CST department. There are several activities taking place on a regular basis that we have endeavored in our Technical Magazine _ SPARK to provide in a capsule, staff and student achievements, industrial visits, FDPs and workshops, placement details, expert and Alumni talks, and events that are regular fixtures in our department.



We also highlight the diverse talents present in our students and faculties and hope to motivate them positively through our Technical Magazine _ SPARK. I would like to thank The Management of MITS, The Correspondent of the Academy, Dr. N. Vijaya Bhaskar Choudary, Principal, Dr. C. Yuvaraj, HOD, Dr. M. Sreedevi, and the student editors for their great effort to make this Technical Magazine _ SPARK a significant publication. We welcome suggestions to improve our content.

Sincerely ,

Mr. N. Junnu babu
Assistant Professor
Department of CST



SAI DEVIKA
4TH YEAR



MADHUMIDHAN
4TH YEAR



HYNDAHAVI
3RD YEAR



NAGA PRANAY
3RD YEAR



SAI GANANIKA
3RD YEAR



JYOTHSNA
3RD YEAR



KIRANMAIE
2ND YEAR

Editorial Team



Department Vision, Mission, PEOs & PSOs

Vision

To bring forth globally competent engineers with societal consciousness, who thrive in academics and research in Computer Science and Technology.

Mission

- ♦ **M1:** To deliver technical education of the highest quality by improving the curriculum and using effective pedagogical techniques by qualified faculty.
- ♦ **M2:** To foster interaction between Industry and academia, to improve students' abilities in research, innovation, and entrepreneurship.
- ♦ **M3:** To prepare the students to become professionally competent and intellectually adept by imparting required Skills to mitigate the societal problems.

Program Educational Objectives (PEOs)

- ♦ **PEO1:** Graduates will have successful career by contributing for innovation of new technologies and systems in the key domains of Computer Science and Technology.
- ♦ **PEO2:** Graduates will be able to perform technical/ administrative roles in information technology industry / R&D sectors and pursue higher education in reputed institutions.
- ♦ **PEO3:** Graduates will be ethically and socially responsible towards the societal development and opting a career as an entrepreneur with moral values in various domains of Computer Science & Technology.

Program Specific Outcomes (PSOs)

- ♦ **PSO1:** Ability to design algorithms using mathematical models and implement problems through different programming tools to solve real world problems.
- ♦ **PSO2:** Ability to apply Software Engineering Principles & Practices in the domain of compilers, Computer Networks, Operating Systems and allied areas, Mobile and web based applications under realistic constraints.
- ♦ **PSO3:** Ability to implement the principles and techniques of Artificial Intelligence and Machine Learning, IoT and Cloud Computing, Data Analytics & Security by applying them to develop intelligent systems and data-driven solutions.



Applications of Augmented Reality

K.MONISH

21691A2897

3rd Year CST

Augmented Reality is a combination of a real and a computer-generated or virtual world. It is achieved by augmenting computer-generated images on real world. It is of four types namely marker based, marker less, projection based and superimposition based augmented reality. It has many applications in the real world. AR is used in various fields such as medical, education, manufacturing, robotics and entertainment. Augmented reality comes under the field of mixed reality. It can be considered as an inverse reflection of Virtual Reality. They both have certain similarities and differences. This paper gives information about Augmented Reality and how it started. It analyses various types of augmented reality, its applications and its advantages and disadvantages. This paper also gives us knowledge regarding those major threats that augmented reality will face in the near future and about its current and future applications. It gives us a comparison between the two related topics, Augmented reality and Virtual reality. The following paper also helps us know about the effect of Augmented Reality on the human life.

There are four types of Augmented Reality (AR) observed namely,

Marker based AR

This type of reality is also known as Image Recognition . A camera and a visual marker such as a QR code or a 2D code is used. First the marker is sensed by the reader and then the output is given. Apps based on this type uses a camera to differentiate a marker from any other real world object. Markers can be anything which are unique yet simple (e.g. QR Code) and should be detectable by the camera. Calculations of position and orientation is done.

Marker less AR

This type of reality is also known as Location-based reality or GPS. Data which is provided is based on our location and is provided with the help of a digital compass, accelerometer, velocity meter or GPS. All these are inserted in our devices. This type of reality is possible because of the location detection features available on our smartphones these days. It recognizes things that were not directly provided to the application in advance, unlike Marker Based AR. Here, the algorithm only has to identify the patterns, the colors, and the other features in order to provide results.

Projection Based AR

As the name suggests, artificial light is projected onto realworld objects. This allows for human interaction by sensing the touch of that projected light. User's touch is detected by distinguishing between an expected projection and an altered projection. A digital operating canvas is created on virtually any work surface. Projection based AR is used to project a 3D interactive hologram.

Superimposition Based AR

In this type of reality, the original view of an object is either partially or fully replaced with a newly augmented view of that same object . Here, object recognition plays an important role. E.g. IKEA - Augmented Reality Furniture catalogue. It is a virtual furniture app that augments furniture onto real floor.

ADVANTAGES

- AR can be used to increase the knowledge bars of people.
- AR's availability is improper in social situations. AR can help people share experiences over long distances.
- AR has a form of escapism
- A life-like experience can be established by AR games.

DISADVANTAGES

AR's availability is improper in social situations.

- There are no strong security features in this technology.
- AR has a feature of spam
- There are various issues like that of performance, alignment and interaction.



APPLICATIONS OF AUGMENTED REALITY

Medical : Augmented Reality will be far-reaching in the near future. It is being widely used in healthcare sector where there is a need of visualizing the medical information and the patient within the same physical space . Augmented Reality can be used to perform surgeries and can help surgeons perform real time surgeries without being physically present near the patient . Some of the real life examples where AR is being used in medical field are

EyeDecide : This is a medical app which simulates the impact of specific conditions or medicines on a person's vision using a camera. E.g. EyeDecide can demonstrate the impact of cataract.

AccuVein : This app uses a handheld camera which projects over the skin. Thus nurses and doctors get to know where the veins are in the patients' bodies.

Entertainment and Games Augmented Reality can be proved to be a game-changer for entertainment and games. Here, it is possible to interact with the real world and reel world using this technology. AR can be used in Television Broadcasting. Many sports channels use AR thus allowing audience to view graphic overlays . AR is widely used in Gaming too. Apps such as Ingress and Pokémon Go use augmented reality to let gamers play with virtual characters in real world.

Robotics : In this field, AR makes it easier for robots for communicating complex information to humans. Moreover, this technology can help robots perform surgeries by combining AR with surgical robot system for performing head surgeries. In a nutshell, AR is a platform that has made human-robot collaboration possible. Manufacturing Augmented reality has helped in improving the understanding of the product assembly tasks to be carried out. Information overload and the training required for assembly operation can be reduced using the AR approach. In manufacturing, AR can help in complex assembly of machinery, in maintenance of parts and in providing expert support.

Education : Augmented reality in education has been proved to be very fruitful. The young learners can now visualize complex spatial relationships [7] and abstract concepts. This technology helps students to engage in phenomena that are not possible in real world. Moreover, the invisible concepts [7] like magnetic field can now be visualized easily using AR. Augmented Reality can open additional ways and methods of making the learning process easier and interesting.

IoT(Internet of Things)

B NIRANJAN KUMAR REDDY

21691A28B0

3rd Year CST

We are entering in a beginning of a new of computing technology i.e. Internet of Things (IOT). IOT is a sort of “universal global neural network” in the cloud which connects various devices. The IOT is an intelligently connected devices and systems which be made up of smart machines interacting and communicating with other machines, environments, objects and infrastructures and the Radio Frequency Identification (RFID) and sensor network technologies will go up to meet this new challenge. As a result, a very large in size data are being generated, stored, and that data is being processed into useful actions that can “command and control” the things or devices to make our lives much easier and safer—and to reduce our influence on the environment. This paper gives an overview of Internet of Things (IOT) and brief information about IOT applications and challenges in various fields.

The phrase "Internet of Things" was invent by Kevin Ashton in 1999. He made at his place of employment, Proctor & Gamble. During his time there, Ashton came up with the idea of putting a RFID tag on each lipstick and having them communicate with a radio receiver. He put forward as fact that such data collection can be used to solve lots of problems in the real world. At the moment, a lot of connected devices can talk to internet and to our smart phones, and maybe even some similar products, but most of them can't talk to one another because of branded hardware and software with differing standards, languages and communication protocols. For most of the current smart household items, you'll need to use a different app or website to interface with the device. Unless they were especially designed by the manufacturer to work together. K. Rose in 2015 gave reasons that why IOT is possible. He said it is possible due to following reasons: Ubiquitous Connectivity, widespread adoption of IP– based networking, computing economics, advances in Data Analytics, rise of Cloud Computing so, the IOT is the conjunction of a variety of computing and connectivity trends that have been evolving for many decades.

APPLICATION OF IOT IN DIFFERENT FIELDS

- IOT in industry: Indoor Air Quality: Monitoring of oxygen levels and toxic gas inside chemical plants to ensure workers and goods safety. Monitor the temperature inside the industry. In food factories monitoring of ozone levels during the drying meat process. Information collection from Can Bus to send real time alarms to emergencies or provide advice to drivers.

- IOT for Smart Home: IOT that turns the automated home into the smart home. With a combination of sensors, smart systems, IOT connects everyday objects to a network, enabling those objects to complete tasks and communicate with each other, with no human input. This in turn the home automation, connected devices and IOT you get a Smart Home. And a modern smart home can be easily controlled through a smart phone, tablet or computer.
- IOT for Agricultural Production: Implementing IOT in agricultural field for developing the supply and growth of the crop by collecting the information from the environment sensor. The need of agricultural products could be predicted measurably, but due to the slight difference in condition of harvest and weather change, disease and insect damage etc. could not be predicted, so that the supply and need of agricultural products has not been controlled properly. To overcome it, the IOTbased monitoring system to analyze crop environment and the method to improve the efficiency of decision making by analyzing harvest statistics.
- IOT for Health Care: IOT in the healthcare application is used to observe and check the progress the health condition of patient in one end from other end of the spectrum; especially it is more useful for patient in the remote location. IOT Healthcare solutions can remotely monitor patients be affected from various disorders like diabetes, dementia, Alzheimer etc., These applications will not only improve the access to care while increasing the quality of care but also reduce the cost of care.
- IOT in Transportation: IOT less in amount traffic congestion in the city. GPS and time information from city buses is displaying a city-wide view of the public transport system, with the action of predicting something of bus arrivals, transit times and route congestion on a digital map of the city. Based on this information, the city can take designed to correct the action to reduce traffic congestion and keep city buses running smoothly.

CHALLENGING AREAS

Security: There is a lot of chances of malware entering into the IOT network because it connects a lot of devices in the network. In case of less intended to protect someone where the devices are also less expensive are a subject to make unauthorized alterations. The integration of middleware, APIs, machineto machine communication, etc. produce a lot of complexity and new security risks.

Trust and Privacy: With remote sensors and the action of watching a core use case for the IOT, there'll be heightened sensitivity to dominant access and possession of knowledge. The action can still be a significant issue in medical and assisted-living applications, which might have life and death unwelcome consequence of an action. New compliance frameworks to deal with the IOT's serving to distinguish it from others problems can evolve. Social and political issues during this space may make it difficult IOT adoption.

- Complexity, confusion and integration problems: With multiple platforms, various protocols and huge numbers of arthropod genus, IOT systems integration and testing are challenges refer to briefly the smallest amount. The uncertainty about what is happening around evolving standards is nearly bound to slow adoption. The fast evolution of arthropod genus can probably consume out of the blue development resources that may diminish project teams' talents to feature core new practicability.
- Evolving architectures, protocol wars and competitive standards: With such a large amount of players attached the IOT, there are sure to be in progress an area wars as a legacy corporations ask for to shield their proprietary systems blessings and open systems proponents try and set new standards.
- . Concrete use cases and compelling worth propositions: Lack of clear use cases can cut down adoption of the IOT through technical specifications, theoretical uses and future ideas might serve for a few early adopters, thought adoption of IOT would force reasoned, customer-oriented communications and electronic communication around "what's in it on behalf of me."

Through IOT, each and every object in this world can be identified, connected and take decisions independently. In the near future the Internet and wireless technologies will connect different sources of information such as sensors, mobile phones and cars in an ever tighter manner. The number of devices which connect to the Internet is – seemingly exponentially – increasing.

Application of AI/Machine Learning

SAYEED . S

20691A28F5

4TH Year CST

Machine Learning (ML) and Artificial Intelligence (AI) techniques learn models or inference rules from data. Classification, clustering, rule based systems, etc., are some sub categories which learn the latent knowledge of the domain using training data. In early days limitations in data availability and computing power made them to use only for simpler tasks. Recent advances in robust algorithms combined with huge data publicly available and increase in computing power created more successful applications making ML/AI techniques very popular. Presently, ML/AI techniques are being used in all fields. In this paper, we are going to present few selected papers in which ML/AI techniques are successfully applied.

Data exploratory techniques like PCA and sparse representations are discussed in Signal and Data Processing applications. Section on Human Computer Interaction system explains in detail about OCR for printed and handwritten data of Indic script, Document Image segmentation techniques and text detection in images. Computer system section discusses in detail about performance of cache, schedulers in system performance

subsection and about intrusion detection, trust models and replica selection in the subsection system security. Finally, few different applications using Neural Network are discussed in the section applications of Neural Networks.

APPLICATIONS TO HUMAN COMPUTER INTERACTION

Another important application to ML/AI is Human Computer Interaction systems. Here variety of applications are built like Optical Character Recognition (OCR) for printed and handwriting, documents preprocessing, etc. In following sections we will discuss few popular applications.

Printed Recognition Classical OCR problem converts text in images or scanned documents into editable text format. The complete OCR system has several steps like data preprocessing, segmentation and then recognition. OCR problem is a well studied problem in literature. Here, we present work done on one of the Indic scripts, Telugu. Telugu is a South Indian language with more than 100 million speakers. Authors used glyphs (connected components) as basic recognition units. They used fringe maps to represent the glyphs and performed template matching for classification. Different factors in segmentation and recognition stage that affect the system performance are discussed in detail. A complete system for printed Telugu OCR is first presented. Authors in this paper proposed novel techniques for handling broken characters and poor segmentation. For broken characters they are identifying the abnormal Connected Components (CC) by matching them with the templates in database and merging with the nearest CC.

If the merged CC is normal then it is stored otherwise it is not stored. The authors also proposed segmentation based on orthographic properties of Telugu script. Binarization of images also affect the system performance.

HANDWRITTEN CHARACTER RECOGNITION

Handwritten character recognition is an extension to printed character recognition. Models built for handwritten character recognition fail to work with handwritten data due to high intra-class variance present in the data. Differences in writing styles of the writers increases the intra-class variance making this problem interesting and more challenging. Authors worked on basic Telugu handwritten characters. They generated sequence numbers for handwritten characters and stored them in tries, which they call as 'sequence tries'. Sequence tries are generated for all templates and now the classification is simply reduced to string matching. For classifying test samples, all that is required is to generate sequence tries and perform string comparison with stored sequence tries.

IDENTIFICATION OF TEXT IN IMAGES

Another important application of ML is identifying text in images. It is different from classical OCR problems as the images contain graphics along with text and layouts also differ. Recognition part may be same but the difficulty lies in text segmentation. One such efficient system for text identification can be seen .Here first Sobel gradient magnitudes for image are found and then Hough transforms are applied to get text regions. Since Telugu script is circular in nature, Hough transforms for circles are used to locate text. Recursive XY cut approach is used on located regions to segment into regions of paragraphs, lines and words. A bottom up approach is employed to extract words from located regions. Zoning is done using a 4×4 grid on locally binarized words to identify glyphs. Cavity filling is done after analysis of glyphs to generate structural feature vectors. Finally template matching is used for classification of glyphs.

APPLICATIONS OF ML TO COMPUTER SYSTEMS

System Performance

ML can be used to optimize resource utilization leading to system improvement. Generally, in process scheduling, systems consider the time constraint. Using a ML framework which reduces the total turnaround time of the processor. Authors used C4.5 algorithms to predict the important static and dynamic attributes of the programs. Based on these predicted attributes, customized time slices are used in scheduling. This framework reduced the total number of context switches resulting in reduced turnaround time

System Security

Intrusion Detection: Intrusion detection is widely studied problem using ML techniques. In general, intruders are hard to find due to their malicious behavior. Using ML techniques, we can learn models on normal user profiles and some known intruder profiles and this model can be used for intruder detection. **Masquerade:** detection is also another kind of intrusion detection, but one user will be assuming to act as another one.

In this paper, a wide range of systems is revised. These are all based on the works of the first author and his associates. It shows how AI and ML methods are ubiquitous and widespread in their applications to computer systems.

New Analytic Framework of Public Mental Health Prediction Using Data Science

Madhu Sree Sane

20691A2883

4th Year CST

Abstract

This study investigates how social media usage contributes to social network mental disorders (SNMD), such as cyber dependence, information overload, and network crush. By utilizing data science and social media mining, the research proposes a novel approach for early detection of SNMD without traditional self-diagnosis questionnaires. The framework employs a tensor-based model called Social Network Mental Disorders Detection (SNMDD) to analyze user behavior and predict mental health risks effectively.

Introduction

Mental health issues often go unnoticed, significantly affecting individuals' thoughts, behaviors, and overall wellbeing. Depression, anxiety, and related disorders have become more prevalent due to increased social media engagement. This study explores a data-driven approach to identifying SNMD based on patterns in online behavior.

Key developments include:

- Identifying three types of SNMD: Cyber Relation (CR), Net Compulsion (NC), and Information Overload (IO).
- Leveraging machine learning algorithms for precise prediction.
- Analyzing online-offline interaction, social capital, and user activity patterns for detection.

Related Work

The research builds upon prior studies in internet addiction and mental health, emphasizing the growing impact of technology on psychological wellbeing. Key references include:

- Internet addiction and its subtypes such as cybersex and online gaming.
- Associations between mental health conditions (e.g., ADHD, depression) and excessive internet use.

Proposed System

The SNMDD framework consists of three main components:

1. Data Collection: Extracting activity metrics, such as login/logout patterns, selfie counts, and interaction durations, to capture user behavior.
2. Tensor-Based Feature Analysis: Using tensor models to analyze latent behavior patterns and classify users based on their risk of SNMD.
3. Semi-Supervised Learning: Employing machine learning algorithms like mini-batch gradient descent to enhance prediction accuracy and scalability.

Advantages

- Automated detection of SNMD based on behavioral patterns.
- Efficient handling of large-scale data through tensor decomposition.
- Real-time prediction capability.

Results and Discussion

The proposed SNMDD framework was validated through a survey involving 3,126 social media users. Key findings include:

- High accuracy in detecting SNMD symptoms.

- Effective differentiation among the three identified types of disorders.

Limitations of the approach include:

- Dependence on the quality of input data.
- Ethical concerns regarding the use of personal data for prediction.

Conclusion

This framework successfully demonstrates the potential of data science in identifying mental health risks associated with social media usage. While the results are promising, integrating additional data sources such as wearable devices and health records could further enhance predictive capabilities. Ethical considerations and privacy concerns remain critical challenges.

Future Scope

- Expanding data sources to include medical records and user surveys.
- Developing intervention mechanisms for individuals identified as high-risk.
- Enhancing model interpretability to facilitate broader adoption in clinical settings.

Detection and Classification of Pneumonia in Chest X-ray Images Using Deep Learning Techniques

Nimmanapalle Ruhin TaJ

24691D5822

4th Year CST

Abstract

Pneumonia, a respiratory disease affecting the lungs, is a major health concern, particularly in developing countries. Early detection is critical for effective treatment and improved survival rates. This study presents a computer-aided diagnosis (CAD) system that utilizes deep learning techniques to automate pneumonia detection from chest X-ray images. Key components of the system include advanced convolutional neural networks (CNNs) and transfer learning models such as VGG16, CovXNet, and RNN. The proposed approach demonstrated high accuracy on public datasets, offering a promising solution for clinical applications.

Introduction

Pneumonia is a leading cause of hospitalization and mortality worldwide, especially among vulnerable populations such as children and the elderly. Traditional diagnostic methods involve manual examination of chest X-rays, which can be subjective and prone to delays. Automated systems powered by deep learning offer the potential to enhance diagnostic accuracy and efficiency.

Literature Survey

The study reviews existing approaches to pneumonia detection:

Combination Models: Techniques combining handcrafted features with deep CNNs for multi-disease classification.

COVID-19 Detection: Systems using X-rays to identify early signs of diseases, achieving high sensitivity and specificity.

Interpretable Systems: Models integrating Bayesian frameworks for enhanced interpretability.

Advanced CNNs: Architectures like DenseNet-169 and self-supervised learning methods for chest X-ray classification.

Proposed System

The proposed system leverages deep learning models for accurate pneumonia detection:

- 1.Convolutional Operation: Extracts features from images using convolutional layers.
- 2.Pooling Layers: Reduces spatial dimensions while retaining important features.
- 3.Flattening: Converts pooled features into a single-dimensional vector.
- 4.Fully Connected Layers: Performs classification based on extracted features.

Key Models:

VGG16: Pre-trained model fine-tuned on chest X-ray datasets for feature extraction and pneumonia classification.

CovXNet: Focuses on local feature learning to handle complex patterns in X-ray images.

RNN: Utilized for sequential data analysis, providing additional robustness in feature recognition.

Methodology

1. Dataset Preparation: Publicly available chest X-ray datasets were used, with images preprocessed to enhance quality and ensure consistency.
2. Model Training: CNN models were trained and fine-tuned using transfer learning techniques.
3. Performance Metrics: Accuracy, sensitivity, specificity, and F1-score were used to evaluate model performance.

Results and Analysis

Accuracy: High accuracy was achieved using VGG16 and CovXNet, surpassing baseline models.

F1-Score: The models demonstrated superior performance in distinguishing pneumonia-affected cases from normal cases.

Visualization: Heatmaps were generated to illustrate areas of interest in the X-ray images, aiding interpretability.

Conclusion

The proposed CAD system effectively automates pneumonia detection using advanced deep learning techniques. Its high accuracy and robustness make it a viable tool for assisting radiologists in clinical settings.

Future Scope

Future enhancements include:

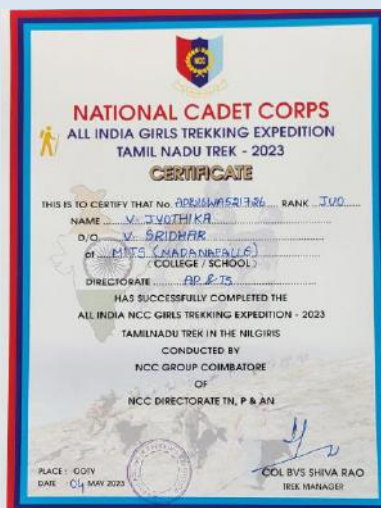
- Expanding datasets to include diverse populations and conditions.
- Integrating additional modalities such as CT scans for improved diagnostic accuracy.
- Developing lightweight models for deployment on mobile and edge devices.

Student Extra Circular Activities



NCC:

The NCC activities for the academic year 2023–2024 involved 7 dedicated cadets from the institution, with significant achievements and contributions at both individual and group levels. The following details provide a comprehensive breakdown:



V. Jyothika (21691A2863)

Total Participants: 7

4 (3rd Year) received C Certificates; 1 student attended an Army Camp.

3 (2nd Year) received B Certificates.

Key Highlights**Training Focus:**

The cadets were trained in leadership, discipline, and defense skills during their tenure in NCC.

Certification Details:

‘C Certificate’: Recognized for enhancing opportunities in defense services and adding weight to career profiles.

‘B Certificate’: Serves as a prerequisite for ‘C Certificate’ and demonstrates active participation in basic training.

Army Camp Participation:

The Army Camp attendee gained exposure to advanced drills, weapons training, and teamwork, offering a pathway to excel in defense-related pursuits.

Summary of Contributions

The NCC cadets of the institution actively participated in activities that fostered discipline, leadership, and national service. Their achievements in earning certifications and attending camps reflect their commitment to personal growth and their potential to contribute to national defense initiatives.

NSS (National Service Scheme):

The NSS (National Service Scheme) for the academic year 2023–2024 showcased significant student participation in community service, health camps, and special programs. Here’s an in-depth account of the activities and contributions:

Key Activities and Participation**Blood Donation Camp**

Venue: MITS

Participation: 15 students actively donated blood and supported the event.

Impact: Contributed to saving lives and raising awareness about the importance of blood donation.

7-Day Special Camp

Venue: Seelamvaripalli

Participation: 5 students attended this week-long camp.

Activities:

Cleaning and sanitization drives.

Tree plantation and environmental awareness campaigns.

Educational sessions and interaction with the local community.

Eye Check-Up Camp

Venue: MITS

Participation: 3 students were part of this initiative.

Focus: Provided free eye examinations for students and staff, promoting eye health and early detection of issues.

Heart Check-Up Camp

Venue: MITS

Participation: 3 students volunteered.

Focus: Assisted in organizing heart health check-ups, emphasizing awareness about cardiovascular well-being.

Key Highlights

Volunteer Efforts: NSS volunteers played a vital role in organizing and ensuring the smooth execution of these events.

Skill Development: The participants developed leadership, organizational, and communication skills while contributing to the welfare of society.

Community Impact: The camps and programs directly benefited local communities and created awareness about health and hygiene.

Summary of Contributions

The NSS unit of the institution demonstrated remarkable commitment to social responsibility. Through their participation in health camps and community activities, they made a positive impact, aligning with the NSS motto: "Not Me, But You."

Total Participants: 33

15 students contributed to a Blood Donation Camp at MITS.

5 students participated in a 7-Day Special Camp at Seelamvaripalli.

3 students participated in an Eye Check-Up Camp at MITS.

3 students participated in a Heart Check-Up Camp at MITS.

Sports & Games

Total Participants: 10

Basketball: 3 medals (2 boys, 1 girl).

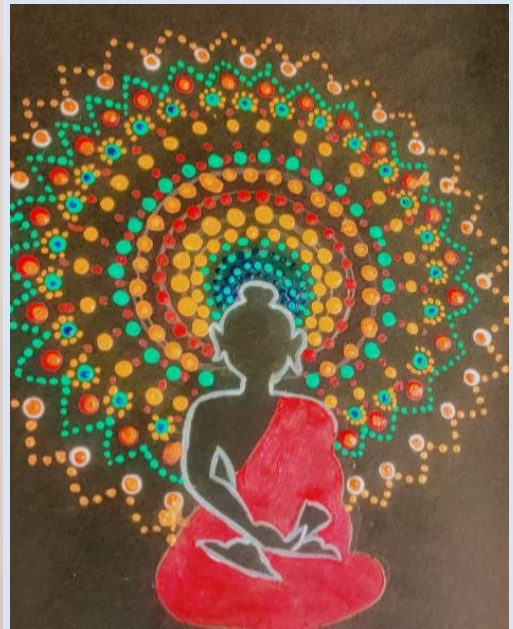
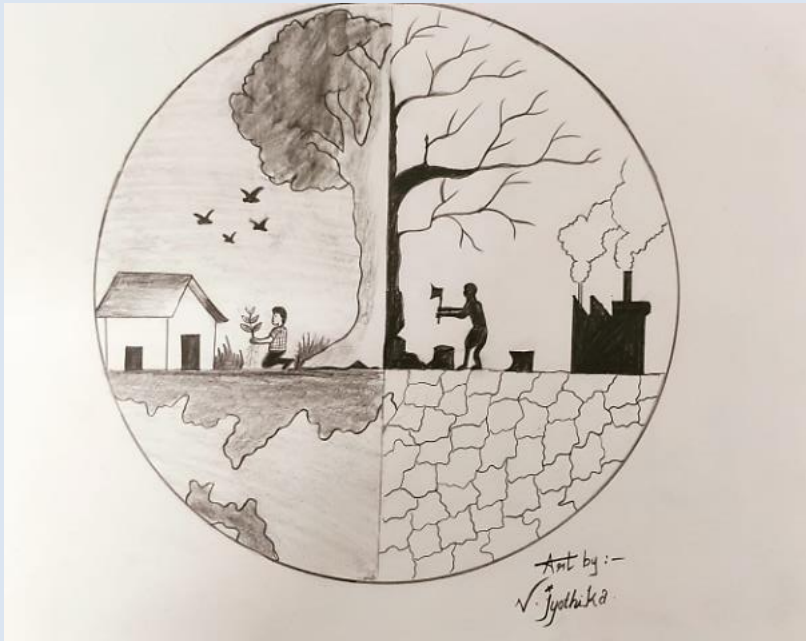
Volleyball: 3 medals (2 boys, 1 girl).

Badminton: 2 medals (2 girls).

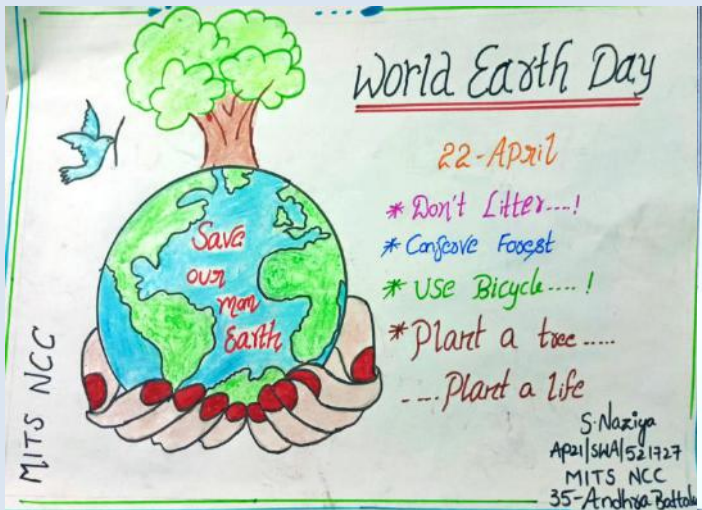
Kabaddi: 2 medals (1 boy, 1 girl).

Throwball: 2 medals (2 girls).

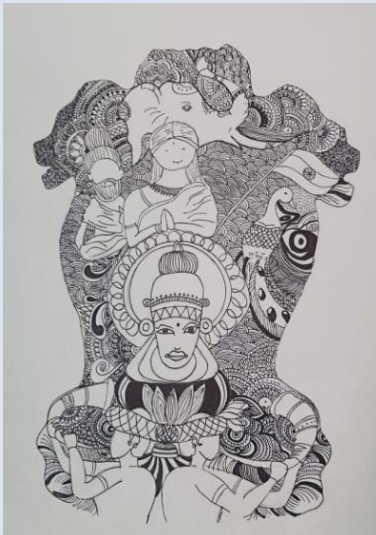
V. Jyothika (21691A2863)



Naziya . S (21691A28A9)



K. Charitha sai (21691A2817)



S. Jayanthi (21691A2860)

