

**A Report on Expert Talk on  
"Artificial Intelligence and Machine Learning"  
Organized by Department of CSE-Artificial Intelligence & Machine Learning  
on 08.11.2024**



**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE**  
(UGC-AUTONOMOUS INSTITUTION)  
Madanapalle - 517325, Annamayya Dist., Andhra Pradesh, India

**Expert Talk**  
on  
"Artificial Intelligence and Machine Learning"

Organized by  
**Department of Computer Science and Engineering - AI & ML**  
in association with Industry Institute Interaction Cell (IIIC)

**Resource Persons**

Date : 8/11/2024  
Time : 10:00 AM  
Venue : Seminar Hall A

		
Abdul Rahman Business Development Executive	Balaji Sampath Senior Project Lead	Manigandan Srinivasan Business Analyst

Chief Patron Dr. N. Vijaya Bhaskar Choudhary Secretary & Correspondent	Patron Mrs. Keerthi Nallala Executive Director	Program Chair Dr. C. Twaraj Principal	Convener Dr. S. Padma Associate Professor & Head	Coordinators Dr. E. Sandhya, Asst. prof Mr. B.S.H. Shayeez Ahmed, Asst. prof
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**Report Submitted by: Dr. E. Sandhya, Assistant Professor, Department of CSE-AI & ML; Mr. B.S.H. Shayeez Ahamed, Assistant Professor, Department of CSE – AI & ML.**

**Resource Persons Details: Mr. Abdul Rahman, Business Development Executive, Xenovex Technologies; Mr. Manigandan Srinivasan, Business Analyst, Xenovex Technologies, Mr. Balaji Sampath, Senior Project Lead, Xenovex Technologies, Chennai.**

**Participants: II Year CSE – AI & ML and CSE – Networks – 141 Students**

**Venue: Seminar Hall – A**

**Mode of Conduct: Offline**

**Report Received on 12.11.2024**

Department of Computer Science & Engineering – AI & ML has organized an expert talk to the students titled “Artificial Intelligence and Machine Learning” on **08.11.2024** (Friday).

**Welcome Address:**

The event commenced at 10:00 AM with a warm and engaging welcome address to all by Dr. E. Sandhya, Asst. Professor, Department of CSE – AI & ML, Madanapalle Institute of Technology & Science (MITS), Madanapalle. The sessions' primary goal is to make a smart computer system like humans to solve complex problems. The program motivated the students with insights of how to accelerate their career and sharpen their skills in the field of AI & ML. The program also highlights the latest emerging trends and career opportunities in Artificial Learning area.



**Keynote Address:**

Dr. S. Padma, Associate Professor & Head, Department of CSE – AI & ML, Madanapalle Institute of Technology & Science (MITS), Madanapalle welcomed the resource persons with her keynote address and motivated the students to enrich themselves. She elaborately discussed about the purpose of AI which is to reduce the workload of humans. As such, AI automates routine and repetitive tasks which helps reduce the time and manpower that's usually needed to complete such tasks.

Dr. P. Ramanathan, Professor, ECE, Vice Principal – Academics, MITS, Madanapalle explained about the Innovative Ideas. He motivated the students to enlighten among themselves by utilizing the Presentation and he discussed about the importance of skills, insisted about the practical knowledge & benefits of the session.

### Resource Person Lecture:

Mr. Abdul Rahman, Business Development Executive at Xenovex technologies explained about the projects & services provided by Xenovex Technologies.

### The resource person shared the following points in the session

- The resource person highlighted the impact of AI & ML in today's life.
- Artificial Intelligence has undergone an exciting period of growth and development.
- Humans are concerned about the risks linked with AI as it has advanced to a degree never before seen.
- AI is popular to create machines that can do tasks without the help of human intelligence.
- The main goal of artificial intelligence is to automate jobs by building robots.
- These robots have the capacity for reasoning, learning, and adapting to various situations. They will act much like humans would in any situation.
- One can achieve AI by learning and analysing the behaviour of humans to develop intelligent systems.
- For example, they learn and try to make decisions to act in certain situations. The idea is to observe humans while problem-solving in simple tasks and using those results for developing intelligent systems.
- The goal of AI is to create technology that allows machines and computer systems to do smart work.

### How Does Artificial Intelligence Work?

- AI is a section of computer science that aims at building smart machines. The way [how does AI work](#), varies significantly depending on the specific application and approach.
- An AI system accepts data input in the forms of speech, text, images, etc. to start. The system then processes data by using different rules and algorithms. It interprets, makes predictions, and takes appropriate action. Following processing, the system outputs the results of the data input, indicating success or failure.
- After that, the outcome is evaluated by analysis, research, and feedback. Then, the system modifies its desired outcomes, rules, and input data based on its evaluations.
- It repeats this loop until it attains the desired outcome. Artificial Intelligence examples include the search algorithm, face detection theory, recognition algorithm, and chatbots, among others.



- **Key AI Components:** AI components have a broader context that reflects an understanding of their environment. All its parts must cooperate for it to be considered artificial intelligence, though. Let's comprehend the main elements of AI.

**Machine Learning:** AI applications that use machine learning automatically learn from the data. It gets better at handling data from the past without the need for explicit programming.

- **Deep Learning:** A subset of ML, deep learning learns by processing data with the aid of artificial neural networks.
- **Neural Networks:** Computer systems called neural networks, which enable deep learning, work on the neural connections in the human brain.
- **Cognitive Computing:**
  - Computer modelling that mimics human thought processes is known as cognitive computing. It aims to mimic and enhance human-machine interaction by knowing spoken language and the significance of visual cues.
  - Later Mr. Balaji Sampath who is a Senior Project Lead at Xenovex, where he oversees and manages the execution of critical projects, ensuring their successful delivery within scope and on time discussed about Design Thinking.

### Design Thinking:

- Design thinking is a systemic, intuitive, customer-focused problem-solving approach that organizations can use to respond to rapidly changing environments and to create maximum impact.
- It is based heavily on the methods and processes that designers use (hence the name), but it has actually evolved from a range of different fields—including architecture, engineering and business. Design thinking can also be applied to any field; it doesn't necessarily have to be design-specific.
- Design thinking is extremely user-centric. It [focuses on humans first and foremost](#), seeking to understand people's needs and come up with effective solutions to meet those needs. It is what we call a solution-based approach to problem-solving.

### Difference between Solution-Based and Problem-Based Thinking?

- Solution-based thinking focuses on finding solutions; coming up with something constructive to effectively tackle a certain problem. This is the opposite of problem-based thinking, which tends to fixate on obstacles and limitations.

- A good example of these two approaches in action is an empirical study carried out by Bryan Lawson, a Professor of Architecture at the University of Sheffield. Lawson wanted to investigate how a group of designers and a group of scientists would approach a particular problem.
- He set each group the task of creating one-layer structures from a set of coloured blocks. The perimeter of the structure had to use either as many red bricks or as many blue bricks as possible, but there were unspecified rules regarding the placement and relationship of some of the blocks.
- The scientists adopted a technique of trying out a series of designs which used as many different blocks and combinations of blocks as possible as quickly as possible. Thus, they tried to maximize the information available to them about the allowed combinations. If they could discover the rule governing which combinations of blocks were allowed, they could then search for an arrangement which would optimize the required color around the layout.

The designers, on the other hand, selected their blocks in order to achieve the appropriately coloured perimeter. If this proved not to be an acceptable combination, then the next most favourably coloured block combination would be substituted and so on until an acceptable solution was discovered.

### Five Phases of Design Thinking:

Later, Mr. Balaji Sampath discussed about the phases of design thinking.

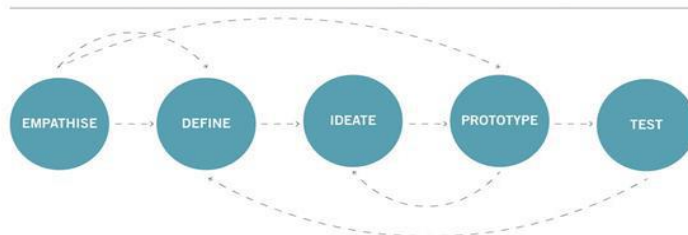
- Later the next resource person Mr. Manigandan Srinivasan who is a Business Analyst at Xenovex, where he plays a key role in analyzing and optimizing business processes to drive operational efficiency and strategic growth explained about Machine Learning & Natural Language Processing
- Natural language processing has become a part of our daily lives. It now plays a crucial role in simplifying once-time consuming tasks.
- A perfect example is sending a voice command to a smartphone, a virtual home assistant, or even a car to get a task done. Voice-enabled tools, including popular ones like Google Assistant, Alexa, and Siri, all use NLP and [machine learning](#) to function properly.
- Machine learning, natural language processing, and [artificial intelligence](#) are often used interchangeably. However, there are significant differences among the three.
- AI is a branch of computer science that lets computers learn and accomplish tasks previously handled by humans.
- Machine learning is a part of AI that gives computers the capability to learn and become better from experience without the need to be explicitly programmed again.
- Natural language processing is also a type of AI that gives systems the ability to read, understand, and interpret human language. This means machines can make sense of spoken or written text and execute tasks such as sentimental analysis, automatic text summarization, and speech recognition.

### THE 4 PRINCIPLES OF DESIGN THINKING

- 1. THE HUMAN RULE**  
All design activity is social in nature
- 2. THE AMBIGUITY RULE**  
Ambiguity is inevitable — experiment at the limits of your knowledge!
- 3. ALL DESIGN IS REDESIGN**  
While technology and social circumstances may change, basic human needs remain unchanged.
- 4. THE TANGIBILITY RULE**  
Prototypes help to make ideas tangible, enabling designers to communicate them effectively.



### 5 PHASES OF THE DESIGN THINKING PROCESS



## Relationship between ML and NLP

- There is sometimes a confusion over the association between machine language and natural language processing. ML can be applied in NLP technology, but there are several types of NLP that function without relying on AI or ML. A good example is an NLP tool that is designed to simply extract basic data. It may rely on systems that do not need to learn continually through AI.
- Machine learning for NLP encompasses a series of arithmetical systems to identify different sections of speech, sentiment, entities, and other text aspects. These systems can be in the form of a model that can be applied to other sets of texts in what is known as supervised machine learning.
- In addition to being a model, the systems can also be a series of algorithms that function across large datasets to extract meaning in what is called unsupervised machine learning.
- When dealing with NLP in machine learning, it is vital to understand the main dissimilarity between supervised learning and unsupervised learning. This way, it is easier to obtain the best out of both in just one system.

## Important Python libraries for NLP

### Natural Language Toolkit (NLTK)

- NLTK is one of the top frameworks for creating Python applications that can operate on human language data. Sentence identification, tokenization, lemmatization, stemming, parsing, chunking, and POS tagging are just a few of the text processing functions that it has. Over 50 corpora and lexical resources can be accessed through NLTK's user-friendly interfaces.

### spaCy

- Python's spaCy is an open-source NLP package. It allows you to create applications that process massive amounts of text because it is specifically intended for use in production environments. It can be used to build information extraction or natural language processing systems. It has word vectors and pre-trained statistical models, and can accommodate more than 49 languages for tokenization.

### TextBlob

- TextBlob provides very convenient APIs for standard NLP tasks, including POS tagging, noun phrase extraction, sentiment analysis, classification, language translation, word inflection, parsing, n-grams, and WordNet integration. The objects it creates can be thought of as Python strings with NLP training.

### CoreNLP

- Since CoreNLP is developed in Java, a device must have Java installed. The library does, however, provide programming interfaces for a number of well-known languages, such as Python. Numerous NLP technologies from Stanford are included in the tool, such as named entity recognizer (NER), part-of-speech tagger, sentiment analysis, bootstrapped pattern learning, and coreference resolution system. In addition, CoreNLP supports Arabic, Chinese, German, French, and Spanish languages.

### Vote of thanks:

The session formally concluded with a vote of thanks delivered by **Dr. E. Sandhya, Assistant Professor, Department of CSE – AI & ML**. she expressed sincere gratitude to resource persons for the time to share their expertise. She extended her thanks to the Management, Principal and the HOD for their support to conduct the workshop.

### Outcomes:

At the end of Workshop, Students will be able to

1. Understand the necessity of AI components.
2. Understand the significance of Design Thinking.
3. Understand the concept of Natural Language Processing using Machine Learning.
4. Analyzing the Python libraries for Natural Language Processing.