

# News Letter



## IEEE Computational Intelligence Chapter, Bangalore Section (R-10), Bangalore

Presents

IEEE -CIS(Bangalore Chapter) NewsLetter 2021-22  
From the Technical Advisor, IEEE-CIS, Bangalore Section ( R-10)  
By Dr Sumana M , Dr Megha P Arakeri

# News Letter



Dr. Vijaya Kumar B.P , Technical Advisor, IEEE-CIS, Bangalore Section ( R-10)  
M.Tech (IITR), Ph.D (IISc), SMIEEE, Fellow IETE, LMISTE  
PROFESSOR , Dept. of Information Science and Engineering, MSRIT,  
Bangalore

I whole heartedly congratulate the IEEE-CIS, Bangalore Section ( R-10) student's community and faculty for achieving the targets set forth based on the vision and mission of the IEEE-CIS Bangalore Chapter along with the societal community outreach activities shown implicitly in the academics.

Hope this experience and achievements will provide a strong confidence with clarity to face the challenges across the world professionally in the areas of Computational Intelligence.

I am happy to disseminate the aggregated achievements and activities towards the knowledge enhancement that pave a path for the Information society.

# About IEEE-CIS Student Chapter MSRIT

IEEE CIS Student Chapter of MSRIT is a professional society of IEEE focusing on "the theory, design, application, and development of biologically and linguistically motivated computational paradigms emphasizing neural networks, connectionist systems, genetic algorithms, evolutionary programming, fuzzy systems, and hybrid intelligent systems in which these paradigms are contained. It contains vibrant IEEE members with the sole mission of promoting Computational Intelligence technologies that are of social importance benefit to humankind. By conducting several unique workshops and events, the chapter not only work for the betterment of society but also for individual development from learning new technical skills to developing leadership quality.

S. No.	Position	Student/faculty Name	Mem. ID
1	Branch Advisor	Dr. Megha. P. Arakeri	92996742
2	Chair	Divakar Sharma	98186234
3	Vice-chair	Dhruv Dange	98181778
4	Secretary	Dhatvik.MP	98197134
5	Treasurer	A.V.Kavan	98197325

# List of Projects

Following are the list of funded projects of IEEE CIS members of RIT

S.NO		Funding Organization	Coordinators	Amount	Year
1	Design and Development of Head-Mounted Assistive Device for the Blind Using Computer Vision	EPICS in IEEE	<b>Dr. Megha. P. Arakeri, Dr. Vijaya Kumar. B .P, Dr. Sumana. M</b>	\$4,400.29	2022
2	Local Industry Interactions	IEEE CIS	<b>Dr. Vijaya Kumar. B .P, Dr. Sumana. M Dr. Megha. P. Arakeri,</b>	\$3988.66	2021
3	High School Outreach Program	IEEE CIS	<b>Dr. Megha. P. ArakeriDr. Vijaya Kumar. B .P, Dr. Sumana. M</b>	\$1500	2021
4	Local Industry Interactions	IEEE CIS	<b>Dr. Vijaya Kumar. B .P, Dr. Megha. P. Arakeri</b>	\$1570.85	2020
5	High School Outreach Program	IEEE CIS	<b>Dr. Megha. P. Arakeri, Dr. Vijaya Kumar. B .P</b>	\$2000	2020

## Events Organized for the Academic Year 2021-22

S.No.	Activities
1	<b>Online Vocational Programmes in Computational Intelligence</b>
2	<b>Technical Lectures</b>
3	<b>Partial Delivery of Courses</b>
4	<b>Collaborative Industry Academia Community Outreach Activities</b>
5	<b>Curriculum Development</b>
6	<b>Newsletter and Activities Brochures for Sustainable Outcomes</b>

## 1. Online Vocational Courses in the areas of Computational Intelligence

# Brochure

**Department of Information Science & Engineering**  
**RAMAIAH INSTITUTE OF TECHNOLOGY**

**ORGANIZES**  
**VOCATIONAL PROGRAMME ON**  
**"COMPUTATIONAL INTELLIGENCE: A COMPUTING PARADIGM FOR AN INTELLIGENT FUTURE"**

Sponsored by IEEE CIS under with Local Industry Interaction

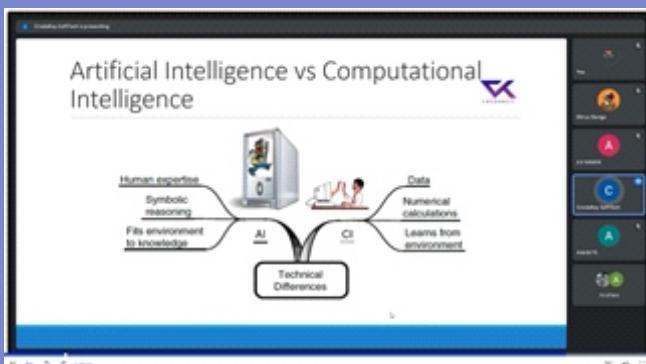
The Objective of the vocational course is to enable learners to understand Computational Intelligence and differentiate it with Artificial Intelligence and machine Learning. This course will familiarize the participants with different learning theories, probabilistic methods and data analysis. The use of Computational Intelligence in the field of Home automation, 5G technology, Healthcare , Biomedicine and several more will also reflected in this course.

**About the company:**

CredoKey SoftTech Pvt. Ltd. is a software solutions provider in the field of EduTech and FinTech. The company has innovative software solutions to automate regular, time consuming tasks by integrating latest technologies to help improve the overall working of individuals. The company also offers various services by implementing hyper-automation to adapt to the growing needs in the field of education and finance. The company also hosts a free self-learning platform for individuals free of cost.

Sl. No.	Topic	Contact Hours	Proposed Dates
1.	Introduction to Computational Intelligence	1	7/1/2022
2.	Difference between Computational Intelligence and Artificial Intelligence and Machine Learning and its applications	2	7/1/2022
3.	Fuzzy logic	3	8/1/2022
4.	Neural networks	3	8/1/2022
5.	Evolutionary computation	3	9/1/2022
6.	Learning theory	3	9/1/2022
	Computational Learning Theory (CoLT)		
	Statistical Learning Theory (SLT)		
7.	Introduction to Probabilistic methods	3	14/1/2022
8.	Introduction to Biomedicine	3	16/1/2022
9.	Introduction to Data analysis	3	16/1/2022
10.	Cyber-Physical Systems	3	21/1/2022
	IoT		
	Robotics		
	Advances in home-automation system		
	Introduction to 5G technology		
<b>Tools:</b>			
1. OpenAI	<b>Course Fee:</b> IEEE members: No registration fees Non IEEE members : Rs 500/-		
2. Node-RED	<b>Registration Details:</b> Bank Name: CANARA BANK		
3. Home Assistant	Bank Account No: 0683101031735		
4. AnyLogic	IFSC Code: CNRB0000683		
5. Torch (PyTorch)			
6. Keras			
<b>Click on the below link to register :</b> <a href="https://bit.ly/3pPFf99">https://bit.ly/3pPFf99</a>			
<b>Click on the link to join WhatsApp group</b> <a href="https://chat.whatsapp.com/LCgAd4lQRzYAFafu">https://chat.whatsapp.com/LCgAd4lQRzYAFafu</a>			
<b>Contact Details:</b> Dr Sumana M , sumana.m@msrit.edu			
<b>Timings:</b> Friday: 5:30PM to 8:30PM Saturday and Sunday: 10AM to 1PM 2:30PM to 5:30PM			

# ScreenShots



Date	7th Jan 2022 to 21st Jan 2022
No. of participants	30
Total Duration of the sessions	30
Industry Involved	CredoKey SoftTech Pvt. Ltd.
Resource person	Mr Koushik S , Co Founder of CredoKey



**Summary:** The Event was inaugurated by the IEEE-CIS members on 7th January 2022 followed by an introduction to Computational Intelligence. The difference between Computational Intelligence, Artificial Intelligence and Machine Learning was discussed in detail with interesting videos and illustrations. Concepts like fuzzy logic, Neural Networks and Evolutionary Computation were elaborated with real life examples. Hands on sessions were conducted to encourage participants in the area of Computational Intelligence, Data Analytics, and probabilistic methods. The last 2 sessions concentrated on several applications in IoT, Robotics, Home automation and 5G Technology. The course materials were shared with the participants. Participants were evaluated for their understanding at the end of the last session.

## B. Vocational Course on “Practical Aspects of Computational Intelligence”

### Brochure

**RAMAIAH** Institute of Technology **IEEE** Computational Intelligence Society **IEEE** BANGALORE SECTION

**DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING**

**RAMAIAH INSTITUTE OF TECHNOLOGY**

**ORGANIZES**  
**VOCATIONAL PROGRAMME ON**  
**PRACTICAL ASPECTS OF COMPUTATIONAL**  
**INTELLIGENCE**

Sponsored by IEEE-CIS under Local Industry Interaction

The objective of the vocational course is to introduce students to the Practical Aspects of Computational Intelligence. The course will familiarize the participants with Virtualization concepts, building blocks of cloud computing, practical aspects of Data Science and Artificial Intelligence. The need and usage of Python programming required for Machine Learning will also be educated to the students. Further, participants will be trained to understand the working of various tools such as Azure, Databricks that will benefit them to use Artificial Intelligence in real world problems.

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### About The Course

Speaker Name	Topic	Date	Time	Hours expected for audience
Meeha	Virtualization concept Building blocks of cloud computing Seas, Ports, feels Cloud providers - introduction Distributed programming	02-Apr-22	2:00 PM - 3:30 PM	2 hour
Meeha	What is Data science and AI What is Data science and AI Why Data engineering: Big data is important for Data science and AI Bigdata fundamentals Tools and technologies Bigdata in Azure & Azure	02-Apr-22	4:00 PM - 5:30 PM	2 hour
Meeha	Data Lifecycle Q&A	02-Apr-22	5:30 PM - 6:00 PM	
Varun	Data science fundamentals - I	07-Apr-22	6:00 PM -	2 hour
Varun	Azure ML Services	08-Apr-22	6:00 PM -	2 hour
Raja Ray	Azure ML Ops training	11-Apr-22	6:00 PM -	2 hour
Raja Ray	Databricks fundamentals	12-Apr-22	6:00 PM -	2 hour
Sabari	Time series analysis - Supervised learning	26-Apr-22	6:00 PM -	2 hour
Sabari	Deep learning fundamentals	27-Apr-22	6:00 PM -	2 hour
Sabari	Clustering - Unsupervised learning	28-Apr-22	6:00 PM -	2 hour
Sabari	Associate Rule mining - Unsupervised learning	29-Apr-22	6:00 PM -	2 hour
Meeha	Re-enforcement learning	30-Apr-22	6:00 PM -	2 hour
Anirban and Varun	Real world use cases and implementation	02-May-22	6:00 PM -	2 hour

**Technical Advisors:**  
Dr. Vijaya Kumar B. P, Advisor, IEEE CIS, Bangalore Section  
Dr. Sanjay H A, Professor & Head, Dept. of ISE, RIT

**Coordinators:**  
Dr. Suman M, ISE Dept, SIEEE, MIEEE-CIS  
Dr. Megha. P. Arakeri, Chair, IEEE CIS, Bangalore Section

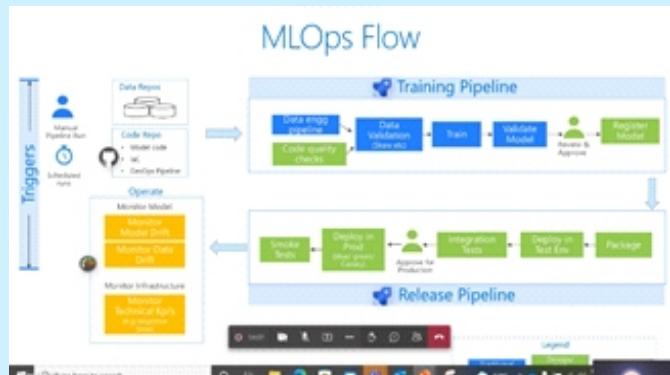
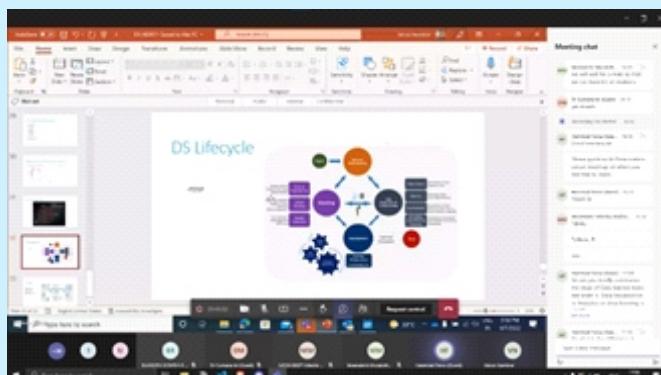
**Student Coordinators:**  
Divyakar Sharma  
Dhrush Dange  
Anurag DS

**QR Code for Registration**

Click on the below link to register : <https://bit.ly/3qey12uc>  
Click on the link to join WhatsApp group <https://bit.ly/3dGmUJZt>  
Contact Details:  
Dr Suman M , sumana.m@msrit.edu

**TIMINGS:**  
**2ND APRIL ONWARDS**  
**4PM-6PM**

### ScreenShots



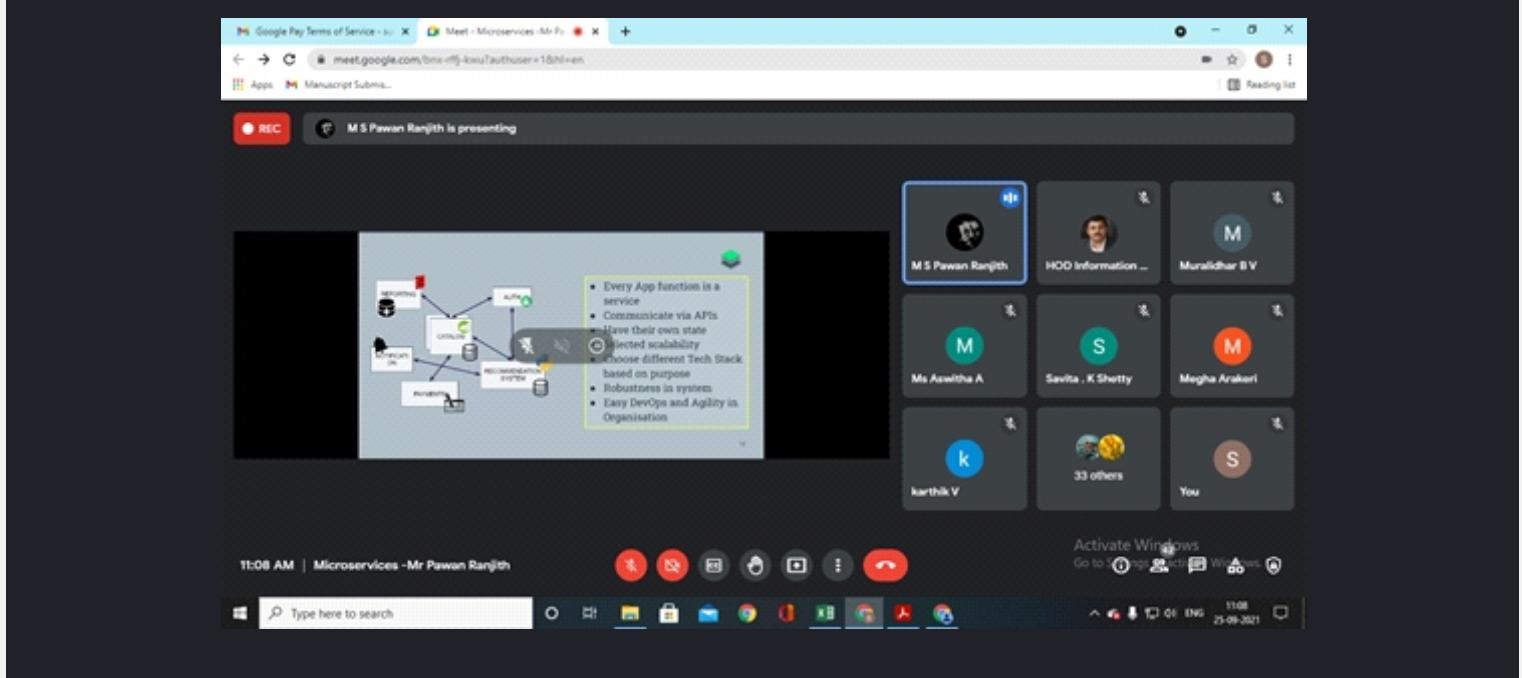
Date	2nd April 2022 to 2nd May 2022
No. of participants	60
Total Duration of the sessions	30
Industry Involved	Mindtree, A Larson and Tourbo Group Company.
Resource person	Meenakshi Muralidharan - Chief Architect of Modern Data Platforms Varun Nambiar - Data Scientist of Data Science & Engineering Raja Ray - Technical Architect of Modern Data Platforms Anirban P - Principal Data scientist of AI Sabarikannan - Senior Solution Architect of Data science & Engineering

Summary: Meenakshi Muralidharan (Chief Architect of Modern Data Platforms) Briefed about the cloud and web applications. Indicating that Servers and companies that own datacenter. She discussed about Utility based computing (Cloud Services) which includes Virtualisation, dividing physical server into virtual servers using a virtualisation software, Data center. She elaborated on Service Models that provide Platform (PaaS), Infrastructure (IaaS), Software (SaaS) with suitable examples. Further, concepts of big data and distributed computing was elaborated on. Varun Nambiar explained the fundamentals of data science and Azure ML concepts with programs and illustrations. Raja Ray introduced the participants to the DataBricks framework and introduced python programming in this platform. Sabari Kannan and Meenakshi delivered sessions on various form of learning such as supervised and unsupervised Learning. The last session by Anirban included discussion regarding real world use cases and approaches on implementing them. The course materials were shared among the participants. Software Licenses were bought for handling the sessions. Appropriate Cloud Infrastructure was provided to enable understanding the practical aspects.

## **2. Technical Lectures and Partial Delivery of courses**

### **A. Technical Lecture 1**

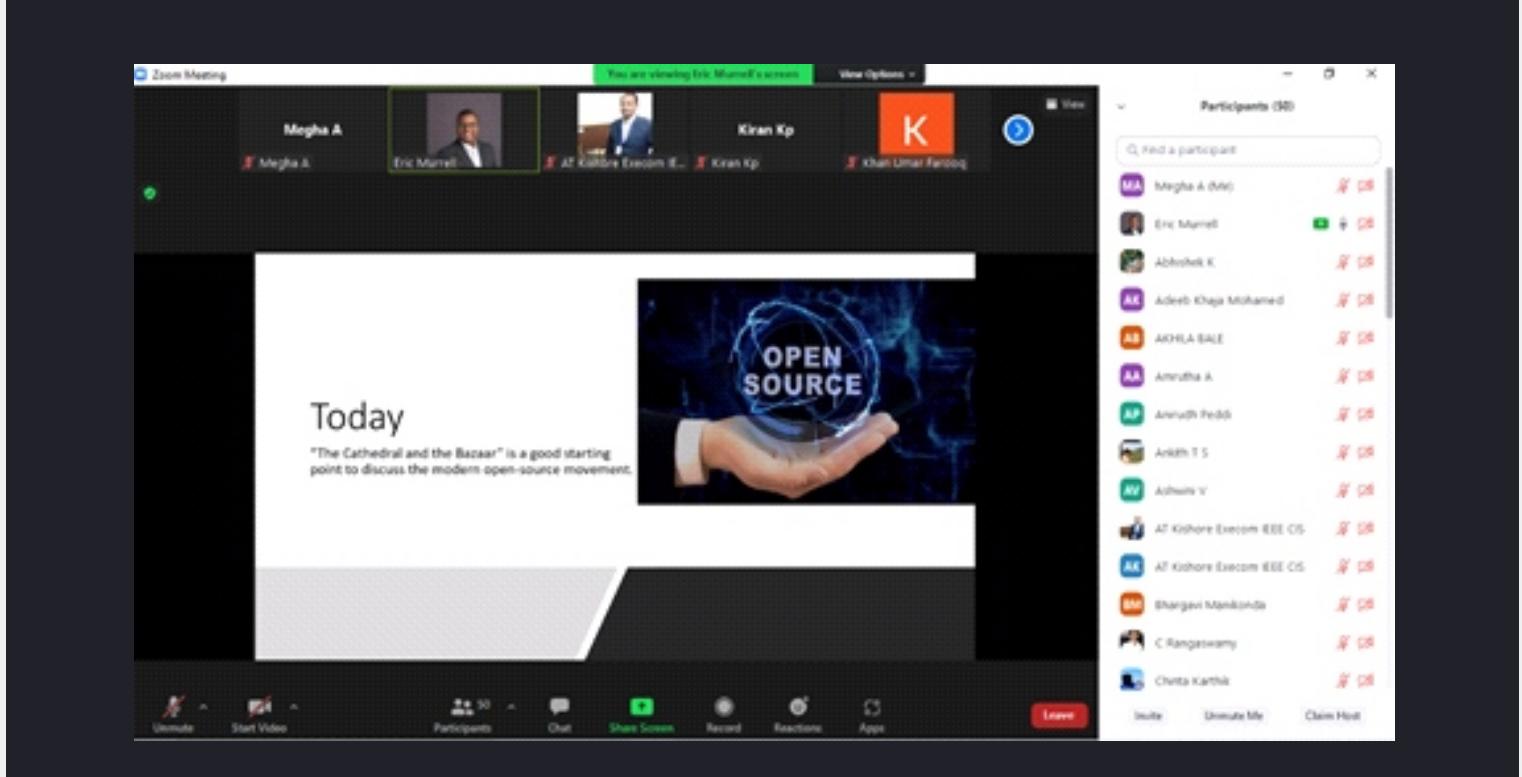
<b>Topic</b>	<b>Microservices: Evolving Cloud Architecture Pattern</b>
<b>Date</b>	25 Sep 2021 at 10.30am
<b>No. of participants</b>	45
<b>Resource person</b>	Mr M S Pawan Ranjith, Software Engineer at JP Morgan Chase & Co



Every day, our needs are changing, and these changes are happening on a dynamic scale. For Instance, ten years before traffic wasn't a part of our urban life, today traffic is part of our livelihood. Similarly, the landscape of modern IT solutions is changing dynamically, and Microservices helps to cater to these needs in an energy-efficient and cost-efficient way. Microservices are an approach to distributed systems that have fine-grained services that can be changed, tested, scaled, and deployed independently of others. As part of this webinar agenda, we would look upon the Key concepts of microservices, Advantages of the microservices approach, The patterns and anti-patterns of Microservices, how to break a Monolith into Microservices, and How Cloud can enable a faster way to hit production.

## B. Technical Lecture 2

<b>Topic</b>	Making projects work with open -source
<b>Date</b>	March 14th,2022 Time:7.30 pm to 8.30pm
<b>No. of participants</b>	45
<b>Resource person</b>	Mr Eric Murell, Director -Ecosystem Development, Open Networking Foundation, USA



The speaker answered the following questions such as why is open source required and why should one contribute towards open source. The need of open-source software is immense in the recent scenarios and as the result it makes our task easier to maintain. The various steps of creating and working with open-source software was conversed. Several illustrations and trends in open source were the cream of the technical seminar. The key benefits, community needs and interesting statistics regarding the usage of open source was elaborated.

### C. Technical Lecture 3

<b>Topic</b>	<b>Health care Technology – Beyond Machines, Perspective and Prospective</b>
<b>Date</b>	March 24th,2022 Time:9:30 am to 11:00 am
<b>No. of participants</b>	50
<b>Resource person</b>	Dr Nandakumar B S , Associate Professor, Ramaia Medical College



Healthcare technologies are required in making accurate decisions regarding health and the type of treatment to be provided. Healthcare changes dramatically because of technological developments, from anesthetics and antibiotics to magnetic resonance imaging scanners and radiotherapy. Future technological innovation is going to keep transforming healthcare, yet while technologies will drive innovation, human factors will remain one of the stable limitations of breakthroughs. The speaker discussed that one of the biggest and most heartening developments being witnessed is the emergence of

collaborative and patient-centric healthcare delivery. With each service focus on its own area of operation, there were plenty of gaps as far as coverage and quality of care is concerned. Telemedicine and doorstep delivery of medicines has eased in providing suitable assistance to the patients. This session was held offline .

## D. Technical Lecture 4

<b>Topic</b>	<b>Enabling Machine human interaction at the Edge using ROOF Computing (IEEE P1931.1)</b>
<b>Date</b>	March 25th,2022 ,Time:2:00pm-3:30 pm
<b>No. of participants</b>	50
<b>Resource person</b>	Mr Nishant Krishna, co-founder , Tech Machinery Labs



Roof is a federated networking and computational paradigm for the Internet of Things (IoT) that is always available for real time onsite operations facilitation including next-hop connectivity for the Things, realtime context building and decision triggers, providing efficient data connectivity to the Cloud/Service providers, and always-on security. The Roof is implemented as a software platform on various devices that proxy the Things and their IoT services to the rest of the world including but not limited to mobile phones, home routers, gateways, personal computers, servers and other computing platforms as appropriate. The speaker discussed the origin of Roof Computing. The role of Roof on Internet of Things, its context and several aspects of Roof Computing were elaborated. The four main functionalities such as Interoperable connectivity for the Things under the Roof, Context building and decisions to take actions in realtime, Information management and efficient connectivity to the Cloud and Service providers and Security & privacy by design were exaggerated with suitable examples.

## E. Technical Lecture 5

<b>Topic</b>	<b>5G be Good for Industry 5.0?</b>
<b>Date</b>	March 26th, 2022 , Time:2:00pm -3:30 pm
<b>No. of participants</b>	50
<b>Resource person</b>	Mr Chetan Kumar, Senior Director of Engineering, 5G MEC



The basic principles

- The three pillars of Industry 5.0
- Put people first
- Our planet is important
- Can be adaptable to all scenarios

The speaker discussed how 5G will support over 250 connected devices per square kilometre, with each device being able to support up to 1GHz in bandwidth. This will see sensors on any device being capable of interconnectivity regardless of wi-fi availability, leading to mobile devices having 24/7 access to bandwidth. It's the end of the dreaded mobile internet 'dead spot'. Perhaps more importantly, the applications 5G will enable are potentially limitless. 5G will enable huge advances in important technology fields - AI, machine learning, IoT and driverless cars to name a few. It's clear that business and industry will need to brace themselves for a fifth industrial revolution- what the tech community is calling 'industry 5.0'. Self-driving cars rely on a constant stream of navigational data will be enabled by 5G to build highly detailed pictures of road networks and creating a connected internet of autonomous vehicles. Virtual reality, which relies on massive amounts of data processing, will be able to take advantage of latency decrease and information transfer capability to generate true virtual environments for consumers.

## Partial Delivery of Courses

### A. Machine Learning Course

Topic	Machine Learning
Date	19 <sup>th</sup> February 2022– 26 <sup>th</sup> March 2022
No. of participants	30
Resource person	Mr Abhijith Chandrababu, Julia Computing Bangalore

**Introduction to Data Science, Data mining and Big Data using Julia**

**About the Course**  
This course is an introductory course on data science and will provide a good in-depth training on various aspects of data science and analytics. Duration of the course will be 2 days, 10 hours each day. All the concepts are general data science concepts and will be taught with examples developed in Julia language. Each module will contain hands on exercises and coding tests. If the tests are passed, a training certificate will be provided to the student.

**Course Content**

**Part I : Data Science**

- Introduction
  - 1. What is Data Science
  - 2. Data Science Workflow
  - 3. Why is Data Science Important?
- Data ETL (Extract Transform Load)
  - 1. Ways to collect data
  - 2. Web Scraping
  - 3. Regular expressions
  - 4. Data Reshaping
  - 5. Data Cleanup
  - 6. Introduction to databases

**Data Analysis**

- 1. Probability review
- 2. Statistical models
  - Generalized linear models
  - Parametric and non-parametric models
  - Regression analysis
- 3. Data Visualization

**Part II : Data Mining**

**Linear Algebra Concepts and Matrix Decompositions**

- 1. Vectors and Matrices in Data Mining and Pattern Recognition
- 2. Linear Systems and Least Squares
- 3. Orthogonality and QR
- 4. Singular Value Decomposition
- 5. Reduced-Rank Least Squares Models

**Data Mining Applications**

- 1. Classification of Handwritten Digits
- 2. Text Mining
- 3. Page Ranking for a Web Search Engine
- 4. Face Recognition

**Part III : Handling Big Data**

**Introduction to Julia**

- 1. Why bet on Julia instead of Python, R or Java.
- 2. Julia solves the multi-language curse.
- 3. Installing Julia and getting hands on.

Mini project solving a Big Data Problem



## B. Cognitive Computing Course

Topic	Cognitive Computing
Date	22 <sup>nd</sup> October 2024 / 27 <sup>th</sup> November 2021
No. of participants	30
Resource person	Nishant Krishna, Software Arch Inventor and Mentor. -Coounder – TechMachinery Labs   Director

**Things to consider while building a Cognitive Application**

Define Information Architecture (IA)

Consider Taxonomy or Classification

Define Ontology or State of the parts/component s of the system

Create a Corpus which is large enough for the application

Consider Cleansing and Filtering of unwanted noise

Consider Metadata and make the system ready for it

Give thoughts to Domain Specific Cognition

Make sense of aggregation of data from disconnected sources

**Process of building a Cognitive Application**

- Implementing a cognitive solution is a multistep process that begins with understanding the goals and objectives of the project.
- These steps begin by establishing your objectives: the domain and key user attributes.
- You also have to define the type of questions you expect users to ask and what insight they may be looking for.
- You are also required to determine and find the relevant data sources both from internal and external sources.
- After these stages are complete, you create and refine the corpora.
- The final stage is the training and testing process.

Building a Cognitive Application is not a serial process. It is iterative because data continues to change, and the nature and attributes of users changes.



### 3. Virtual Lab

#### A. Virtual Lab on Python Essentials of Data Science

<b>Date</b>	4 <sup>th</sup> -9 <sup>th</sup> April 2022
<b>No. of participants</b>	65
<b>Resource person</b>	Vetrivel Raju Senior Architect of Modern Data Platforms, MindTree

**RAMAIAH**  
Institute of Technology

**IEEE Computational Intelligence Society**

**DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING**

**RAMAIAH INSTITUTE OF TECHNOLOGY**

**ORGANIZES**

**VIRTUAL LABS ON**

**PYTHON ESSENTIALS FOR DATA SCIENCE**

Sponsored by IEEE-CIS under Local Industry Interaction

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## About The Course

Sl. No	Name of the Speaker	Topic	Date	Timing	Number of Hours
1		Python Fundamentals - I	04-Apr-22	04:00 PM - 05:00 PM	2 hour
2		Python Fundamentals - II	05-Apr-22	04:00 PM - 05:00 PM	2 hour
3	Vetri	Python Handon programming	06-Apr-22	04:00 PM - 05:00 PM	2 hour
4	Menna	Python Libraries for Data science	09-Apr-22	02:00 PM - 04:00 PM	2 hour

**Technical Advisors:**  
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 Dr. Sanjay H A, Professor & Head, Dept. of ISE, RIT

**Coordinators:**  
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 Anurag DS

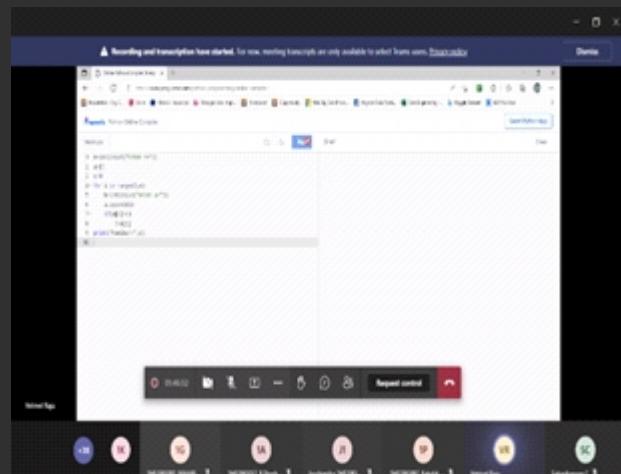
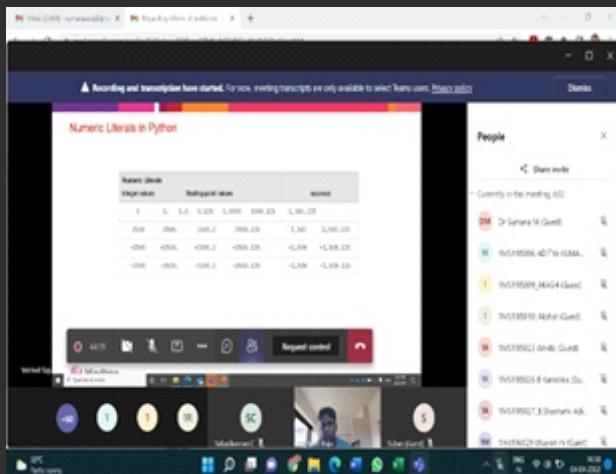
Click on the below link to register :  
<https://bit.ly/3wv12uc>

Click on the link to join WhatsApp group  
<https://bit.ly/36GmUzT>

Contact Details:  
 Dr Sumana M , sumana.m@msrit.edu

**TIMINGS:**  
**4TH APRIL - 9TH APRIL**  
**4PM-6PM**

## Screenshots



**Summary:** Python programming is an essential language for programming applications related to Data Science. Lot of essential libraries are available to allow modelling projects. This virtual lab trained students with the functional, logical and object-oriented aspects of Python programming. The speaker introduced the participants with the python fundamentals, provided hands on training on building applications using python and finally introduced the essential libraries required for modelling machine learning applications.

## B. Virtual Lab on Artificial Intelligence and Machine Learning

Date	Date 13 <sup>th</sup> -25 <sup>th</sup> April 2022
No. of Participants	45
Resource Person	Raja Ray - Technical Architect of Modern Data Platforms, MindTree

**RAMAIAH** Institute of Technology **IEEE Computational Intelligence Society** **IEEE BANGALORE SECTION**

**DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING**

**RAMAIAH INSTITUTE OF TECHNOLOGY**

**ORGANIZES**  
**VIRTUAL LABS ON**  
**AI AND ML CONCEPTS**

Sponsored by IEEE-CIS under Local Industry Interaction

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## About The Course

S.No	Name of the Speaker	Topic	Date	Timings	Number of Hours
1	Databricks ML	DataBricks ML	13-Apr-22	04:00 PM–06:00 PM	2 hour
2	Raja Ray	Algorithms of importance - Databricks	20-Apr-22	04:00 PM–06:00 PM	2 hour
3	Anirban	Azure AI Services	22-Apr-22	04:00 PM–06:00 PM	2 hour
4	Anirban's team	Azure AI Services - part 2	23-Apr-22	04:00 PM–06:00 PM	2 hour
5	Anirban's team	Azure AI Services - part 3	25-Apr-22	04:00 PM–06:00 PM	2 hour

**Technical Advisors:**  
Dr. Vijaya Kumar B. P, Advisor, IEEE CIS, Bangalore Section  
Dr. Sanjay H A, Professor & Head, Dept. of ISE, RIT

**Coordinators:**  
Dr Sumana M, ISE Dept, SIEEE, MIEEE-CIS  
Dr. Megha P. Arakeri, Chair, IEEE CIS, Bangalore Section

**Student Coordinators:**  
Divakar Sharma  
Dhruv Dange  
Anurag DS

**Click on the below link to register :**  
<https://bit.ly/3wy12uc>

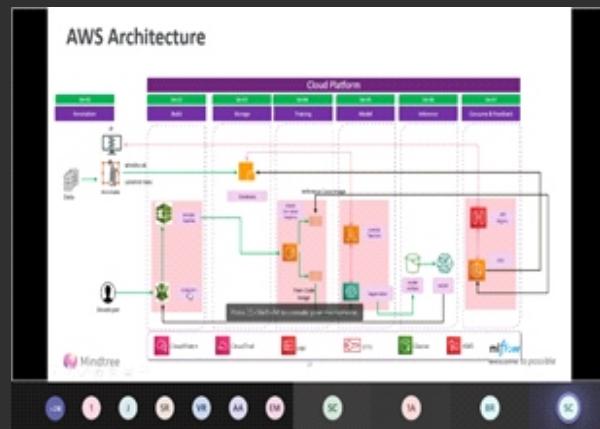
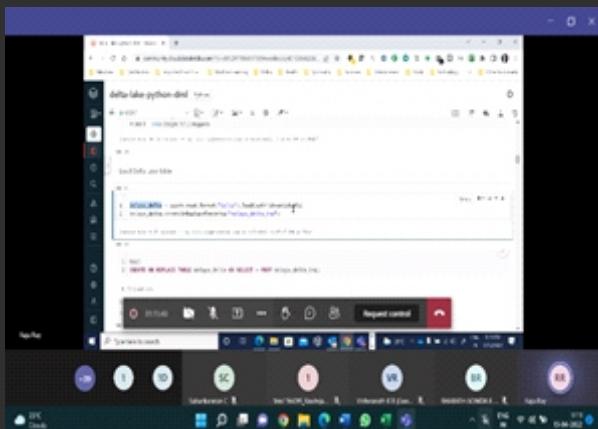
**Click on the link to join WhatsApp group**  
<https://bit.ly/36GmIJZt>

**Contact Details:**  
Dr Sumana M , sumana.m@msrit.edu

## TIMINGS:

**13TH APRIL - 25TH APRIL**  
**4PM-6PM**

## Screenshots

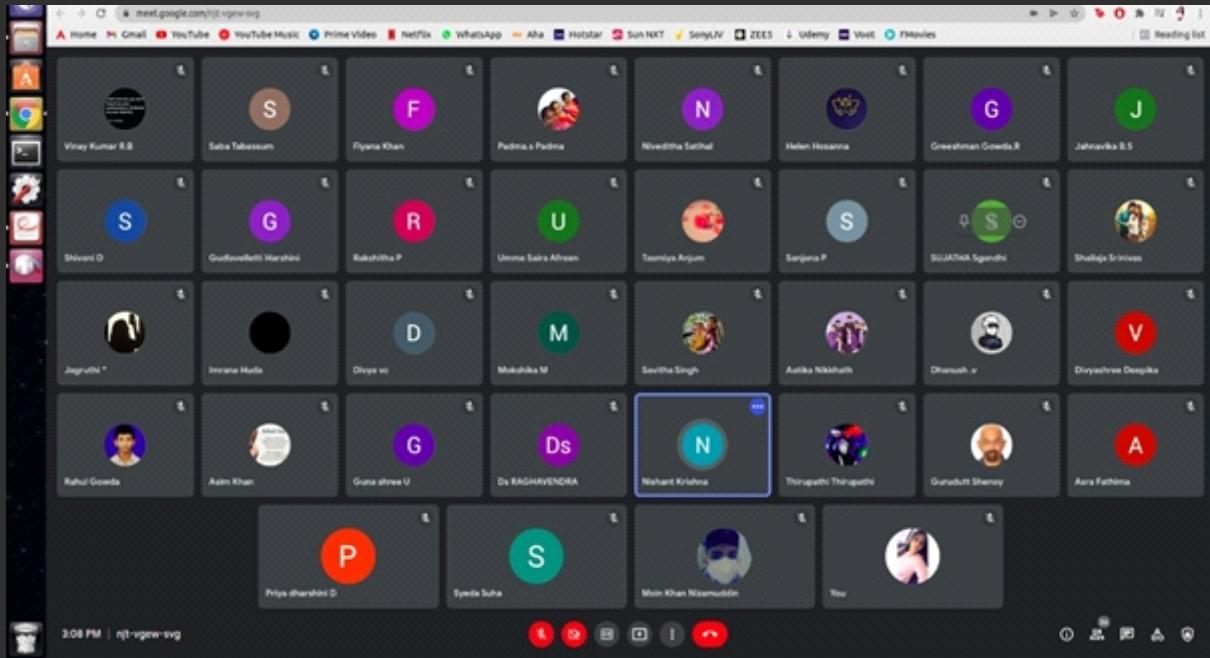


**Summary:** The sessions included introduction to Data Lake, Data bricks ML. Students registered to Data bricks and understood working with big data. The concept of spark was explained to the participants. The Azure AI platform was further discussed. An overview of the AWS, Azure and Google Cloud was provided making Azure framework clear to the participants. Simple AI applications were modelled using Azure AI.

### 4. Collaborative industry academia community outreach activities

#### A. Talk by Mr Nishant Krishna on “ Industry Trends in Computational Intelligence”

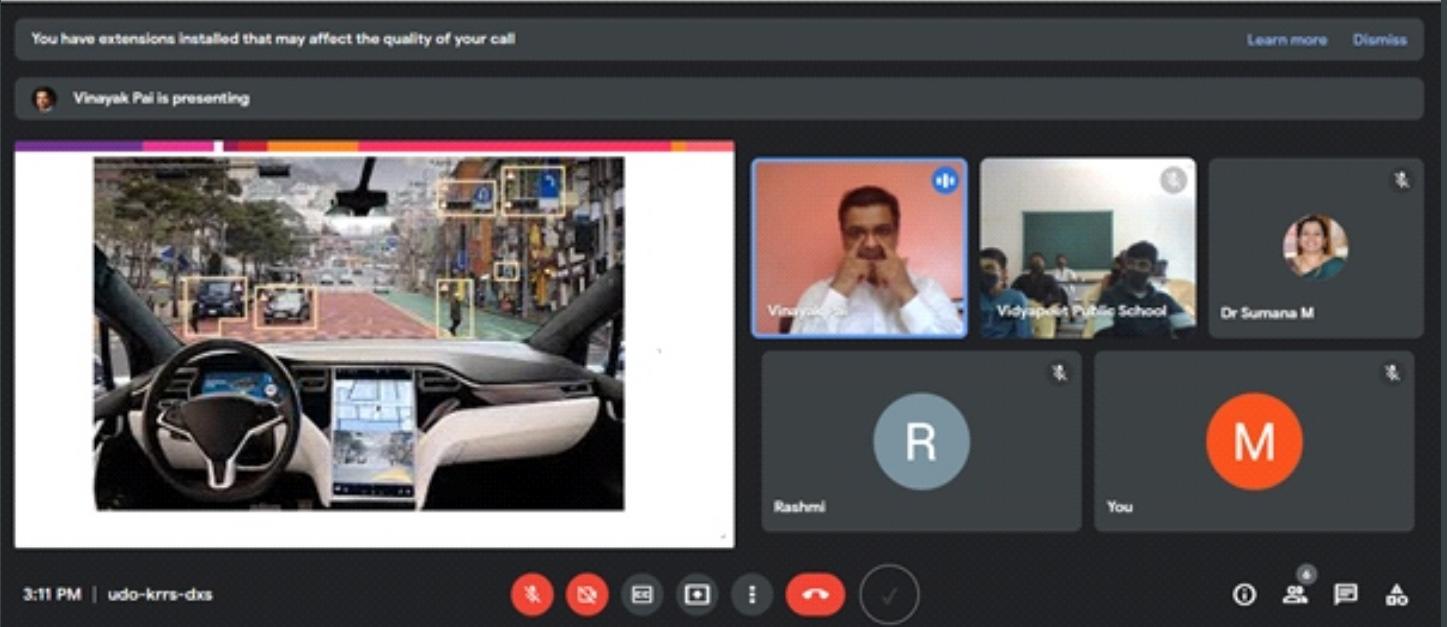
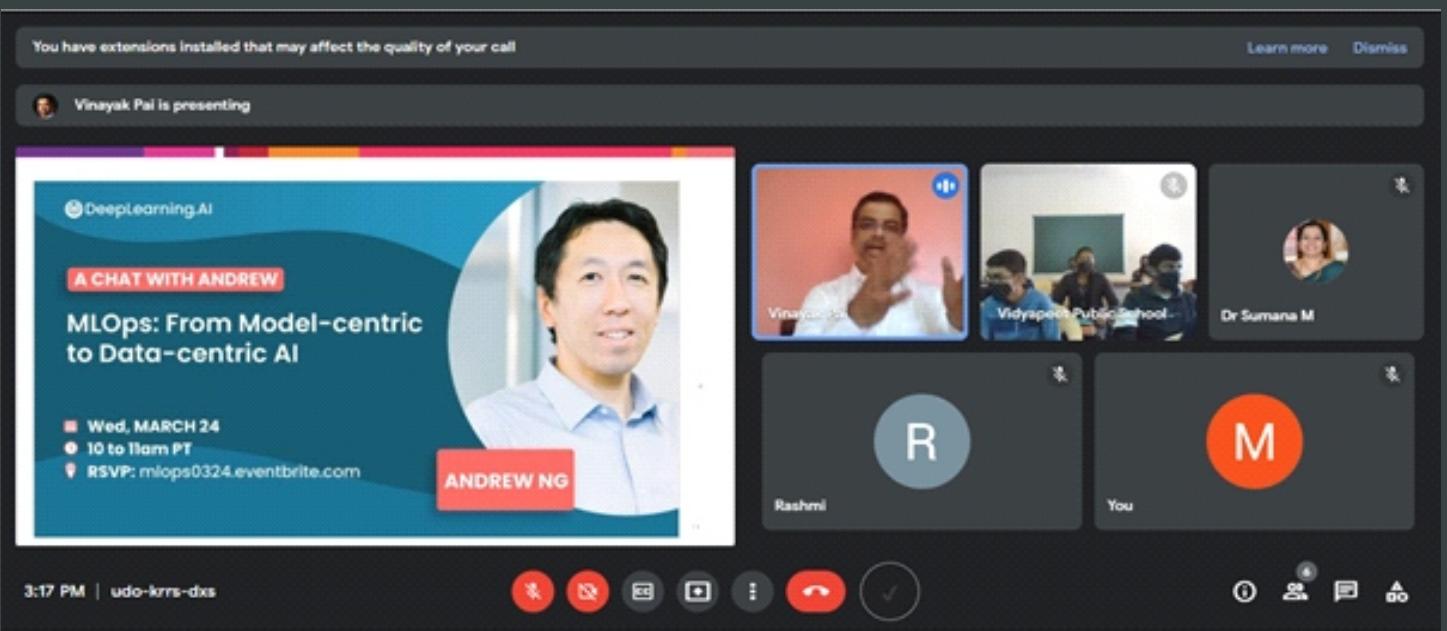
Date	29 <sup>th</sup> January 2022
No. of Participants	35
Resource Person	<b>Mr. Nishant Krishna</b> , Co-Founder, Tech Machinery Labs



The participants in this talk were interested school children from various government schools such as BBMP high school, Iqra high school, Balak English school, M S Ramiah high school, Bapu high school. It was a highly interactive session with students asking the speaker the role, need, recent trends in the industry related to Artificial Intelligence, Data Science and Data Analytics. They wanted to know the reason behind the buzzword “Machine Learning”. Identification of schools to educate the concepts of computational intelligence was a major challenge.

## B. Talk by Mr Vinayak Pai on “ What should a school Kid Know about AI”

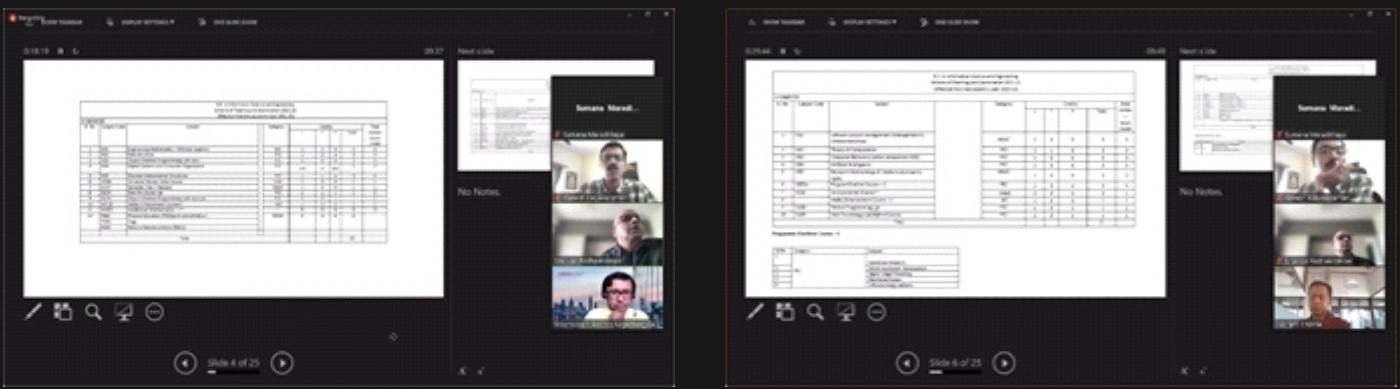
Date	13 <sup>th</sup> January 2022
No. of Participants	35 (School has 30 Students)
Resource Person	<b>Mr. K Vinayak Pai</b> , Practice Lead - Data Engineering Mindtree



The participants in this talk were interested school children from MS Ramaiah government school. The speaker was excited in providing a reflection to the students regarding the career opportunities in Computational Intelligence. He mentioned AI as an ability to taste, see, listen, speak, smell, write, understand, interpret, think and act. He spoke about SIRI, ALEXA, and SOPHIA.

## 5. Curriculum Development

Date	09 <sup>th</sup> April 2022
No. of Participants	34
Resource Person	<ol style="list-style-type: none"><li>1) <b>Nishant Krishna</b>, Chief Technology Officer, TechMachinery Labs</li><li>2) <b>Ganesh Kalyanraman</b>, Vice President, Cognizant, Bangalore</li><li>3) <b>Shankar Radhakrishna</b>, Associate Vice President, Mindtree, Bangalore</li><li>4) <b>Srinivasan Adarsh</b>, Unisys, Bangalore</li><li>5) All faculty members of ISE Dept</li></ol>



**Summary:** This meeting was held to design and develop the NEP curriculum by taking the inputs from the industry experts. The panel consisted of 4 industry experts and faculty members of ISE department. The NEP scheme and syllabus was presented to the industry experts and they provided following suggestions to tune the syllabus.

- Programs of Data structure and Object-oriented programming labs in 3rd semester must be developed using Python as it is a high-end programming language in data engineering, science and analytics
- Data structure and object-oriented programming courses may be fused into one subject.
- Incorporation of the Design thinking course in the first-year syllabus was appreciated as it provides holistic approach to real-world problem solving
- It was advised to schedule industry practitioner's talk on sustainability with respect to software project management, real world problems and industry needs.
- Students should study Statistics and Linear Algebra subjects prior to Data Science
- Discuss more applications /use cases in every subjects
- Intellectual Property Rights (IPR) Subject must be partially delivered by industry expert to give knowledge about patent/product development
- Introduction of more practical sessions and internships in NEP curriculum was appreciated.
- Internship must focus on next generation techniques like cyber security, information security and product management

## 6. Project Showcase

On 11th June 2022, about 11 projects were showcased and evaluated by Mrs Meenakshi from Mindtree, Mr Nishanth from Techmachinery and Mr Chetan from Aikaan Labs. Dr Vijaya kumar B P was the internal evaluator of the projects. These projects were the outcome of the vocational program as well as training on virtual labs. 4 best projects were identified and awarded suitably. This event was coordinated by Dr Sumana M and Dr Megha P Arakeri.

**Department of Information Science and Engineering**  
**MSRIT**  
organizes

## **Project Showcase**

(Outcome of the IEEE-CS Sponsored Vocational Course on  
“Practical Aspects of Computational Intelligence”  
by MindTree)

Date : 11th June 2022

Venue : ISE Lab1

Timings : 9.30 am onwards

Faculty Coordinator  
**Dr. Sumana M**

Technical Advisor  
**Dr. Vijaya Kumar B P**

Head of the Department  
**Dr. Sanjay H A**

Student Coordinators  
**Divakar Sharma**  
**Dhruv Dhangne**  
**Anurag S**

# **Project Abstracts of the showcased Projects are as Follows :**

## **1.Project Title: Image Caption Generator**

### **Members:**

1. **Vinay K, INFORMATION SCIENCE AND ENGINEERING**
2. **Pavana H A, INFORMATION SCIENCE AND ENGINEERING**
3. **Rohan Kumar Shetty, INFORMATION SCIENCE AND ENGINEERING**

### **Abstract**

The project develops a system for users, which can automatically generate the description of an image with the use of CNN along with LSTM. Automatically describing the content of images using natural language is a fundamental and challenging task. With the advancement in computing power along with the availability of huge datasets, building models that can generate captions for an image has become possible.

The project employs the use of a multilayer Convolutional Neural Network (CNN) to generate vocabulary describing the images and a Long Short-Term Memory (LSTM) to accurately structure meaningful sentences using the generated keywords. The convolutional neural network compares the target image to a large dataset of training images, then generates an accurate description using the trained captions.

## **2. Project Title: DDoS attack detection system**

### **Members:**

1. **Gaurav Gupta (1MS19IS040)**
2. **G Sai Jayachandra (1MS19IS039)**
3. **Aditya Arya (1MS19EE004)**

### **Abstract**

DDoS detection is the process of distinguishing distributed denial of service (DDoS) attacks from regular network traffic in order to perform effective attack mitigation. DDoS attacks are primarily designed to restrict access to a network service or application, thereby denying legitimate users access to those services.

DDoS attacks are widely used today and they are continuously becoming more sophisticated. But they all have one goal: overwhelm targeted network resources with traffic or requests for service from dozens, hundreds, or even thousands of different sources. This effectively makes it impossible to stop the attack simply by identifying and blocking a single IP address. As a result of the sheer amount of sources from which attacks originate, legitimate user traffic is very difficult to differentiate from attack traffic.

DDoS mitigation appliances are the primary means of detecting (and remediating) DDoS attacks in real-time. In the face of larger volume threats, they can become expensive and have a short life cycle.

This project proposes an ML model which analyses flow data and network metadata to predict possible DDoS attacks. The goal is to develop a model and predict traffic types by using the deployed model via API.

**3.Project Title:** Deep Learning Based Recyclable Waste Classification and Comparison Between Different Machine Learning Algorithms

**Bharath Gowda R**

**Abstract**

Garbage classification is a social issue related to people's livelihood and sustainable development, so letting service robots autonomously perform intelligent garbage classification has important research significantly. Waste pollution is one of the most significant environmental issues in modern world. The importance of recycling is well known, both for economic and ecological reasons and industry demands high efficiency. Current studies towards automatic waste detection are hardly comparable due to lack of benchmarks and widely accepted regarding the dataset.

The project proposes a smart waste management system in developing countries like India, where smart bins can be used which can be adjusted with level sensing sensor and then when the bins are filled the signals are send to municipalities and the trucks can be allotted to collect the filled bins and then they are sent for classification of recyclable wastes. In this project, 'garbage collection dataset' is trained to build a model that helps in classifying recyclable objects and helps in efficient recycling. The dataset contains 6 different image data: cardboard (393), glass (491), metal (400), paper (442), and trash (1289) and other 4 metadata.

The separation of biodegradable and nonbiodegradable classification can be done by keeping 2 coloured bins (green for biodegradable and blue for nonbiodegradable) but classifying recyclable garbage is difficult, so this project helps in classifying recyclable wastes with the help of deep learning image processing convolution neural networks algorithms in order to train the model. Jupyter notebook IDE is used for training the model and for deploying it. The main objective of this model is to conduct a comparative study between different object detection models based on their performance on my dataset. Models are tuned so as to get higher accuracy and better results in the most unlikely conditions.

Further, a Garbage Detection System is introduced to automatically identify and locate the garbage in real-world images and videos. On training the different models on our custom data set, each model was tested on 5000 garbage images previously not seen by the model. The performance of each model was observed by examining how precisely the model detects and locates the correct class of objects in a particular test image. Convolution neural networks, Recurrent neural networks and Transfer learning algorithm are used for training the model. It is observed that transfer learning model provides highest accuracy with RNN model providing least accuracy and the difference between them is deployed in this model.

#### **4. Project Title: Automated Essay Scoring**

Members:

1. Ankita M Thakur
2. Anusha Chaturvedi
3. Anvita V L

#### **Abstract**

Automated Essay Scoring (AES) is a tool for evaluating and scoring essays. It can be defined as the process of scoring written essays using computer programs. The process of automating the assessment process could be useful for both educators and learners since it encourages the iterative improvements of students' writings.

This project has a great advantage in terms of saving the time for evaluation of the essays and also making it realistic. First the file containing the essay will be preprocessed where null values will be filled and valid features will be selected from the entire dataset after a thorough study. Machine learning algorithms cannot be applied on sentences or words; they can only be used upon numeric data. The dataset has a field which has essays that need to be converted into a numeric form first in order to train it. To do this CountVectorizer is used.

Training data will be fed into the Embedding Layer which is Word2Vec. Word2Vec is a shallow, two-layer neural network. Word2Vec is a particularly computationally-efficient predictive model for learning word embeddings from raw text. Long short-term memory (LSTM) networks were invented to set accuracy records in multiple application domains. Long short-term memory (LSTM) block or network is an advancement to the simple recurrent neural network which can be used as a building component or block for an eventually better serial analysis using the recurrent neural network. Finally, the Dense layer with output 1 predicts the score of each essay.

#### **5 .Project Title : ML model to analyse and predict human illness**

Members:

1. Vishwanath K R
2. Amrutha A

#### **Abstract**

In this project python modules are used. Machine learning model is built and analysed to predict the human disease/illness. Source is from Kaggle, dataset comprises of two CSV files one for training and the other for testing the models. All the columns in the dataset are numerical and the target column i.e., prognosis is a string type and is encoded to numerical form using a label encoder. The cleaned data is used to train all the four models and we will be using confusion matrix to determine the quality of the model. The K-Fold Cross Validation technique for training of the model on k-1 subsets and the remaining one subset is used to evaluate the model performance. Support Vector Classifier algorithm tries to find an optimal hyperplane that accurately separates the samples into different categories in hyperspace. Gaussian Naive Bayes Classifier is a probabilistic machine learning algorithm that internally uses Bayes Theorem to classify the data points. Random Forest Classifier in a random forest classifier, all the internal decision trees are weak learners, the outputs of these weak decision trees are combined i.e., mode of all the predictions is as the final prediction. Bernoulli Naïve Bayes Classifier is another useful naïve Bayes model. The assumption in this model is that the features are binary (0s and 1s) in nature.

Inference: After training the four models we will be predicting the disease for the input symptoms by combining the predictions of all the models (by taking mode). This makes our end prediction much more accurate.

## **6.Project Title : SELF DRIVING CAR SIMULATION**

Members:

**1. Brinda S**

**2. Chandana T**

### **Abstract**

The project touches on building a four wheel vehicular prototype that will detect the obstacles and in turn avoids collision and moves safely towards destination. A test environment is simulated for the simulation tests and ANN algorithms are used for training the model. The main logic has been built using javascript. Preliminary technologies used are HTML, CSS and JavaScript. The various Objectives/ Subtasks that are involved include Perception, planning and decision making. Model is trained using Neural networks, also known as "Artificial neural network" (ANN). An Artificial neural network is usually a computational network based on biological neural networks that construct the structure of the human brain. An evolutionary approach is used.

The Evolutionary algorithms which rely on the population of individual elements each of which represents a search point in the space of derivation and performance. Also comes the concept of Genetic algorithm, i.e., an adaptive heuristic search algorithm is being used that involves 5 phases: Initialization, Fitness , Assignment, Selection, Reproduction and Termination. The population of points, which is usually initialised randomly, evolves towards better regions of search by means of selection, recombination and mutation.

One of the key features of the model is parallelism which is inherent in the search, thereby making it more efficient and leads to improved training times. Another predominant concept is Population Based Incremental Learning, a combination of iterative and evolutionary optimisation techniques. Finally the outcome is a trained model of the chosen car alongside a parallel population of traffic cars(in the simulated environment), being able to sense and detect the lane structures and its adjacent cars, thereby steering accordingly and reaching the destination.

## **7. Project Title: Text Generation using RNN**

Members:

**I MUNI SAI HANEESH (1MS19IS047)**

**HIMANSHU BEHL (1MS19IS046)**

### **Abstract**

The dataset considered is from Shakespeare's Writings text file from Tensorflow.(Open-source). The models used in the project are RNN - LSTM, GRU and Supervised Learning. The project aims to help learners understand how to generate text similar to that of Shakespeare's writings. Automatic text generation using LSTM and GRU Networks is performed and difference between the performance of the 2 methods is learned. In recent years, deep learning technology has made great progress, and text generation based on deep learning has received extensive attention. Text Generating Bots are very useful nowadays in various fields such as Banking, Finance, Public Service, Education, etc. Many bots are available for generating English texts.

The project builds a Shakespeare bot that generates text similar to the writings of Shakespeare that can be of any desired length based on any word(s) we pass as input. It is modelled for literature enthusiasts who are interested in learning about William Shakespeare's writings. Model is constructed using 2 RNN Networks namely LSTM and GRU. Trained the models to many epochs to check the knee point on the loss-epoch graph to find the best number of epochs to train. The project serves as a review of both the methods to find out which one is more accurate. LSTM model may have reached a good accuracy and the loss is less compared with GRU but, the GRU model is more generalized. Also, the LSTM model took more time (nearly 30%) to train compared to the GRU model.

## **8. Project Title: Emotion classification using audio**

Members:

**1.Amith Shubhan (1MS19IS012)**

**2.Bhuvan M (1MS19IS029)**

**3.Shashank adiga (1MS19IS027)**

### **Abstract (150 to 200 words)**

Emotion classification is the process of classifying displayed human emotions using artificial intelligence based technologies in order to evaluate non-verbal responses to products, services or goods. An emotional classification system is modelled that is embedded in a website built using flask and react. Using audio, the deep learning model classifies it into one of the emotions like anger, disgust, fear, happiness, neutral, pleasant surprise and sadness.

It's major advantage lies in health care industry because to decide when patients need medicine, assess their emotional response in clinical trials or to help physicians in deciding how to best triage their patients.

## **9. Project Title: Deep Reinforcement Learning in Unity - Bridge Crossing**

Members:

**1.B Kanishka Reddy**

**2.Aneeq Ahmed**

### **Abstract**

Unity is a cross-platform game engine developed by Unity Technologies, primarily used to develop video games and perform simulations. The Unity Machine Learning Agents Toolkit (ML-Agents) is an open-source project that enables games and simulations to serve as environments for training intelligent agents. A simple environment is created where a single agent, in the form of a ball, has to cross a bridge, without falling off of it, to reach the opposite platform, where its target, a cube is located. It must then contact the cube. A deep RL model is trained using the PPO algorithm, on multiple parallel environments to speed up training, with the agent being able to cross the bridge to reach the target reliably.

## **10. Project Title: Face Mask Detection Using Support Vector Machine and openCV**

Members:

**1. Akshat Saxena (1MS19IS010)**

**2. Mehwish Najam (1MS19IS069)**

### **Abstract (150 to 200 words)**

In the Project data set is created by taking 221 images of face with mask and 221 images of face without mask . Algorithms used are Support Vector Machine (SVM), Support Vector Classifier (SVC), Principal Component Analysis (PCA) and OpenCV.

Covid-19 affected all of us in the worst way it could. Although the very first solution for this was to maintain social distancing and wearing face mask. So wearing a mask became one of the primary protection mechanisms not only to avoid diseases like COVID -19 but also other easily transmittable diseases. As of now, WHO also stated the importance of wearing mask in public and workplaces, so to manage this a model is built to detect if a person is wearing a mask or not. The aim is to model and predict whether a person had worn a mask or not.

In the model it is predicted whether a person has worn a mask or not with the use of Support vector machine Algorithm. In this live images of the person are taken and then it is sent to our model to give the predictions. Before predictions, Pre-processing on image is applied using PCA and OpenCV. A Face Mask Detection Model provides an accuracy >97% depending upon the dataset. It is faster and have better accuracy than the other Algorithm such as CNN(VGG16)

## **11.Project Title: STOCK PRICE PREDICTION USING LSTM**

Members:

- 1.Washitwa Mani Jaiswal-1MS19IS140
2. Yashaswini M-1MS19IS141
- 3.Niharika H G – 1MS19IS081

### **Abstract**

The stock market is known for being volatile, dynamic, and nonlinear. Accurate stock price prediction is extremely challenging because of multiple (macro and micro) factors, such as politics, global economic conditions, unexpected events, a company's financial performance, and so on. But, all of this also means that there's a lot of data to find patterns in. So, financial analysts, researchers, and data scientists keep exploring analytics techniques to detect stock market trends.

LSTM is used to predict the stock prices. Proposed that the Long Short-Term Memory is the most popular RNN architecture. In the secret network layer, LSTM introduces a memory cell; a processing device that replaces conventional artificial neurons, using these memory cells, networks can effectively link memory and remote input in time, making it suitable to dynamically capture data structure over time with a high predictive limit.

Dataset: Tesla stock price, we are using dataset to try and predict the stock prices of tesla Time-series(sequential) dataset is used. So predictive models like linear regression and decision trees are not used instead RNN is used.