Special Research Lab for Artificial Intelligence and Machine Learning

Department of Computer Science and Engineering,
B V Raju Institute of Technology, Narsapur

Report for the Period April-July, 2023

1. **About the Laboratory:**

   In the days of rapid evolutions in the fields of Artificial Intelligence and Machine Learning and highly dynamic novel technology induction rates dominating the computer world, The laboratory was unofficially inaugurated in the November of 2022, with 1 Student in charge, 6 Students, and 1 Faculty in charge. The Laboratory is primarily devoted to cutting-edge research in Artificial Intelligence Methods and Algorithms, Machine Learning and Deep Learning societal applications, and Disruptive technologies. To date, Research has been majorly focused on Behavioral analysis and Data Set Based Scalability of Deep Learning Models. With more possible inductions and equipment support, the laboratory is poised to become a potential State Of Art Research Center in the Department of Computer Science and Engineering on the campus.

2. **Mission, Vision, and Goals:**

   The major aim of this laboratory is to initiate research-oriented exposure to the advancements of Artificial Intelligence and Machine Learning and their societal implications. The mission of the lab is to induce the spirit of building society-oriented systems, involving computer intelligence, with new innovations sprouting daily so as to benefit society with efficient academia-industrial collaborations. The vision of the lab is to design simple economic computer intelligent systems/models which can scale to community and society levels ultimately.

   The goals/Objectives desired in the lab are:

   - To facilitate an effective exposure of students to disruptive technologies and their societal advantages.
   - To ensure maximal disbursal of efficient materials and resources among a broad audience to enhance the academia-societal benefits of Artificial Intelligence and the related Disruptive technologies.
   - Initiate proof-of-concept level collaborative projects and activities for society problem statements
   - Broadcast emerging technologies to all the students and encourage active collaboration and diversity leading to a considerable scale of contributions to society.

3. Laboratory Activities

The major categories of lab activities initiated/planned to be initiated include:

- Fellowships
- Research/Society Projects
- Fundings/Collaborations with external agencies
- Fundings from the Government

A. Fellowships:

Interested students, with a keen research aptitude, can approach the faculty or student supervisors to inquire about the existing projects in progress or to propose their solutions, whether novel or existent. Such prospective candidates may be given the opportunity to work as a student fellow in the lab, which allows them to leverage their industrial experience and adds as one of the valuable contributions in their careers.

B. Research/Society Projects:

Voluntary consultations may be initiated on a periodic basis or on receipt of one's request for collaboration in large-scale projects where student and faculty teams are formed to work on the project with regular reviews with the clients, ranging from pilot surveys to prototyping/proof of concept. In this way, the students can be exposed to agile software principles and extreme programming techniques thus building industry-level professional communities ultimately.

C. Fundings/Collaborations with external agencies:

Innovations and ideas/ suggestions from students may be sent as proposals to various private/public funding agencies that can initiate potential groundbreaking projects in the field of AIML, provided necessary funding, approvals, and Permissions are provided.

D. Fundings from the Government:

The lab supports student aptitude in bringing world-class solutions that can impact communities and ultimately the whole world. With necessary support from the government, the lab aims to initiate certain developmental activities at atomic levels, critical to considerable development for the whole nation.

Activities initiated to date:

1. Identification of interested students from the departments to form multidisciplinary teams to work on society-level projects.

2. PadhAI and School of AI(Eva8 Extensive AI course), Bangalore shared with the teams to implement learn-and-apply strategies.
3. Student-led research performed on the architecture and behavior of various deep learning models with weekly reviews.
4. Collaborated with Civil, ECE departments, and Vedic to work on smart traffic management at Patny X Roads
5. Delivered updates to the concerned agencies from time to time.
6. Research Paper drafting of all the projects in progress.

Project	**Paper title**	**Authors**	**Outcome**
AIML Technologies	Apriori Analysis of Deep Learning models	Sai Sathwik Kosuru Padmanabha Reddy YCA Snehaja Parsi Perala Akanksha Chaitanya Kotagiri Ch Madhu Babu(Hod)	Paper drafted. Reviews in progress. Submission to a reputed conference/journal
AIML Technologies	Scalability of Lightweight Networks	Sai Sathwik Kosuru Padmanabha Reddy YCA Rishanka Madamshetty Sai Ujwal Chelamkury Shreya Ch Madhu Babu(Hod)	Paper is being drafted. Considering submission to a reputed conference/journal
Smart Cities	Smart Traffic Management from CCTV Footage using YOLO NAS and ByteTrack	Sai Kiran Pullela Sai Sathwik Kosuru Padmanabha Reddy YCS	Paper is being drafted. Considering submission to a reputed conference/journal

Members:

Founding Members:

Name	Lab Position	Designation
Dr. Padmanabha Reddy YCA	Faculty Head	Associate Professor, Department of Computer Science and Engineering
Sai Sathwik Kosuru	Student Head	Student, Enrollment Number: 21211A05R6-Second Year, Department of Computer Science and Engineering

Initial Fellows/Lab Teams:

Team 1:

Research Area: Deep Learning Model Architecture and Behavioral Analysis

Name	Roll Number
Sai Sathwik Kosuru	21211A05R6
Snehaja Parsi	21211A05M1
Perala Venkata Akanksha	21211A05N3
Rishanka Madamshetty	21211A05F3
Chaitanya Kotagiri	21211A05D9
Sai Ujwal Chelamkuri	21211A05R7
Akiti Shreya	21211A6702

Team 2:

Research Areas: Smart Cities project in India

Name	Roll Number
Sai Sathwik Kosuru	21211A05R6
Sai Kiran Pullela	21211A05Q0

Drafted by:

Sai Sathwik Kosuru,
Student Lead, and Student Research Fellow,
Special AIML Research Lab