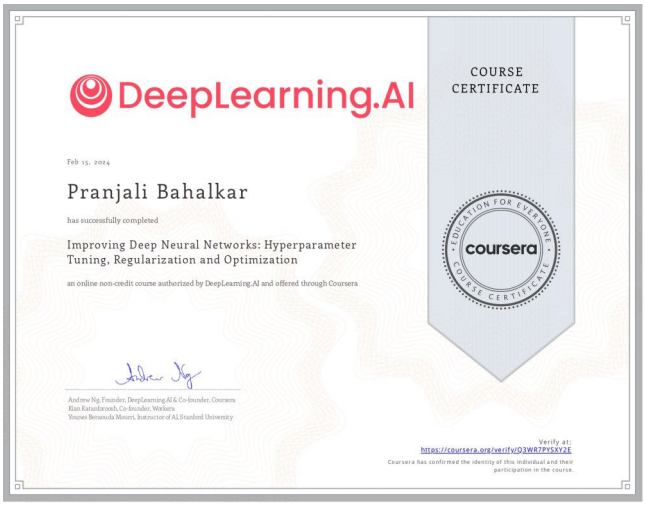
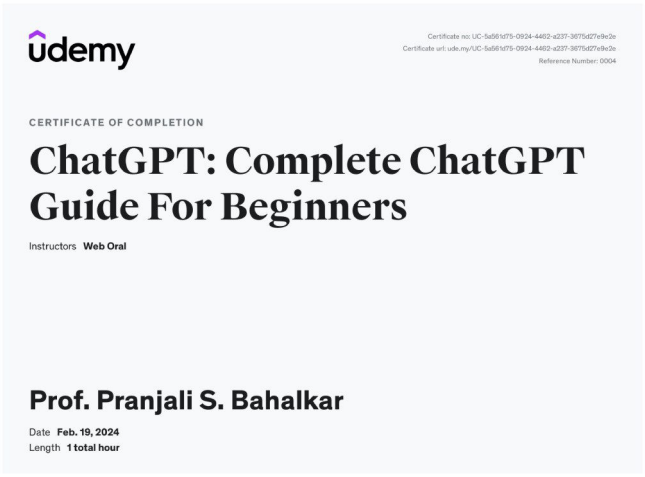
D Y PATIL COLLEGE OF ENGINEERING, AKURDI, PUNE 44
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

NEWS LETTER – FEBRUARY 2024

Faculty Achievements and Participation:

- Mrs. Pranjali S. Bahalkar, Assistant Professor AIDS department, attended workshop "How To Prepare Project Report " on 5th February 2024, and completed certification "Introduction to neural network and deep learning" , "Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization" on 15th Feb. 2024 and "ChatGPT: Complete ChatGPT Guide for beginners" on 19th February 2024.





Faculty Achievements and Participation

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

Dr Vinayak Kottawar
Head of Department

D Y PATIL COLLEGE OF ENGINEERING, AKURDI, PUNE 44
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

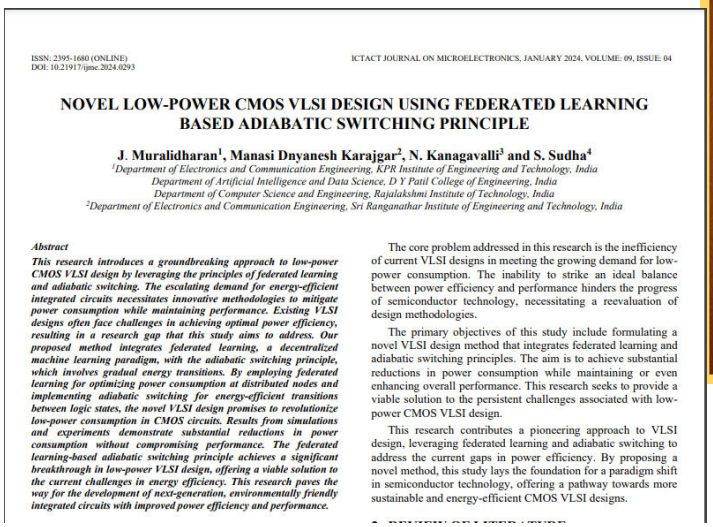
NEWS LETTER – FEBRUARY 2024

Faculty Achievements and Participation:

- In February 2024, Mrs. Manasi Karajgar, Assistant Professor in the AIDS department, published a paper titled "Novel Low-Power CMOS VLSI Design Using Federated Learning Based Adiabatic Switching Principle ." The paper was accepted in January.

- Mrs. Nita Mahale, Assistant Professor AIDS department, has published a paper “Innovation Management with artificial Intelligence: An Overview, Conceptual Framework, and Research Program” and “RC car control with hand gesture and Obstacle Avoidance” in February 2024.

- Mrs. Pranjali S. Bahalkar, Assistant Professor in the AIDS department, has published a book on Business Intelligence with Nirali publication.



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NOVEL LOW-POWER CMOS VLSI DESIGN USING FEDERATED LEARNING BASED ADIABATIC SWITCHING PRINCIPLE

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Department of Artificial Intelligence and Data Science, D Y Patil College of Engineering, India
Department of Computer Science and Engineering, Rajalakshmi Institute of Technology, India
[2]*Department of Electronics and Communication Engineering, Sri Ranganathar Institute of Engineering and Technology, India*

Abstract

This research introduces a groundbreaking approach to low-power CMOS VLSI design by leveraging the principles of federated learning and adiabatic switching. The escalating demand for energy-efficient integrated circuits necessitates innovative methodologies to mitigate power consumption while maintaining performance. Existing VLSI designs often face challenges in achieving optimal power efficiency, resulting in a research gap that this study aims to address. Our proposed method integrates federated learning, a decentralized machine learning paradigm, with the adiabatic switching principle, which involves gradual energy transitions. By employing federated learning for optimizing power consumption at distributed nodes and implementing adiabatic switching for energy-efficient transitions between logic states, the novel VLSI design promises to revolutionize low-power consumption in CMOS circuits. Results from simulations and experiments demonstrate substantial reductions in power consumption without compromising performance. The federated learning-based adiabatic switching principle achieves a significant breakthrough in low-power VLSI design, offering a viable solution to the current challenges in energy efficiency. This research paves the way for the development of next-generation, environmentally friendly integrated circuits with improved power efficiency and performance.

The core problem addressed in this research is the inefficiency of current VLSI designs in meeting the growing demand for low-power consumption. The inability to strike an ideal balance between power efficiency and performance hinders the progress of semiconductor technology, necessitating a reevaluation of design methodologies.

The primary objectives of this study include formulating a novel VLSI design method that integrates federated learning and adiabatic switching principles. The aim is to achieve substantial reductions in power consumption while maintaining or even enhancing overall performance. This research seeks to provide a viable solution to the persistent challenges associated with low-power CMOS VLSI design.

This research contributes a pioneering approach to VLSI design, leveraging federated learning and adiabatic switching to address the current gaps in power efficiency. By proposing a novel method, this study lays the foundation for a paradigm shift in semiconductor technology, offering a pathway towards more sustainable and energy-efficient CMOS VLSI designs.

Faculty Achievements and Participation

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

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Head of Department

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NEWS LETTER – FEBRUARY 2024

Students Achievements and Participation:

- Ms. Pooja Karkhile from TE A div, has successfully completed the Infosys Springboard certification course “Scrum in Practice”, “Agile Scrum Certification” and “Hands on data Visualization with Microsoft Power BI”, respectively on16th February 2024, 13th February 2024 and 16th February 2024 .
- Ms. Isha Waghulde from TE A div, has successfully Published a research article “Early Prediction of Plant disease ESCA” in International Journal of Scientific Research in Engineering and Management 2nd February 2024.

Students Achievements and Participation Certificates

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

Dr Vinayak Kottawar
Head of Department

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NEWS LETTER – FEBRUARY 2024

Students Achievements and Participation:

- Mr. Yogesh Salunke from SE A div, has successfully completed the Infosys Springboard certification course "Learning Internet of Things with Thingworx", on 8th February 2024.
- Ms. Prajakta Nile From BE A div, has successfully completed Certification course on Udemy "ML for Business Professionals using No-Code AI tools" on 6th February 2024.
- Mr. Neel Vadvekar from SE A div, has successfully completed the Be10x 1-Day workshop on "AI-Tools" on 4th February 2024.
- Ms. Maitri Jadhav From BE A div, has successfully completed Certification course on Great Learning "UI/UX for beginners" on 6th February 2024.

Students Achievements and Participation Certificates

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

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Head of Department

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Students Achievements and Participation:

- Ms. Aditi Desai From TE A div, has successfully completed Certification course on Great Learning "Generative AI for beginners" and "ChatGPT for NLP" in the month of February 2024.
- Mr. Abhishek Nandimath From TE B div, has successfully completed Certification course on Udemy "Building Credit Card Fraud Detection with Machine Learning" on 3rd February 2024.
- Mr. Aansh Sharna from TE B Div, successfully completed Google Certification course "Foundation of Cyber Security" on 16th February 2024.

Students Achievements and Participation Certificates

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

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Head of Department

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NEWS LETTER – FEBRUARY 2024

Students Achievements and Participation:

- The IntellexAI Student Association from the AIDS Department organized tech events including "Survive the AI," "Oracle Blocks Contest," "Hop Site Game," and "Dart Throwing Game" in the Advait Tech Fest 2024. Around 80 individual participants took part in "Survive the AI," 10 in the "Oracle Blocks Contest," 15 in the "Hop Site Game," and over 70 in the "Dart Throwing Game."

Some Glimpses Advait Tech Fest 2024

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

Dr Vinayak Kottawar
Head of Department

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NEWS LETTER – FEBRUARY 2024

Students Achievements and Participation:

- The SPPU toppers from the AIDS department were recognized at the DYPCOE annual day event:

1. SE University Rank 4 in 2022: Gaikwad Arya Atulkumar
2. SE University Rank 4 in 2021: Pame Yash Gajanan
3. SE University Rank 8 in 2021: Patil Swaraj Madhav
4. SE University Rank 10 in 2021: Kaklij Aditya Vilas

- Mr. Yash Pame from the AIDS department was awarded the title of Best Outgoing Student at the Annual Fest of the academic year 2023-2024.

Students Achievements Glimpses

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

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Head of Department

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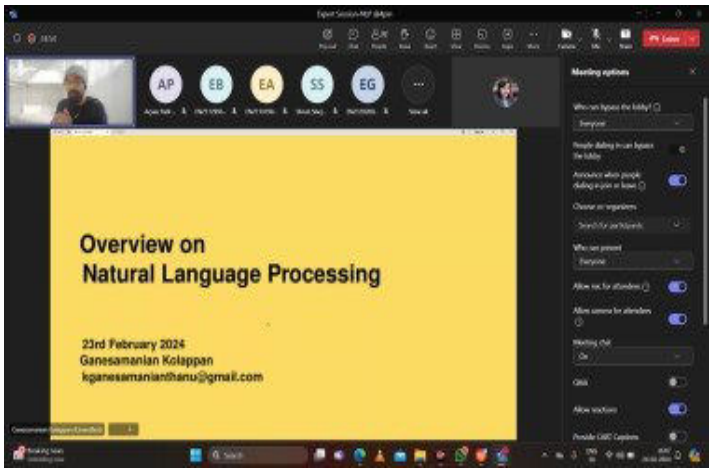
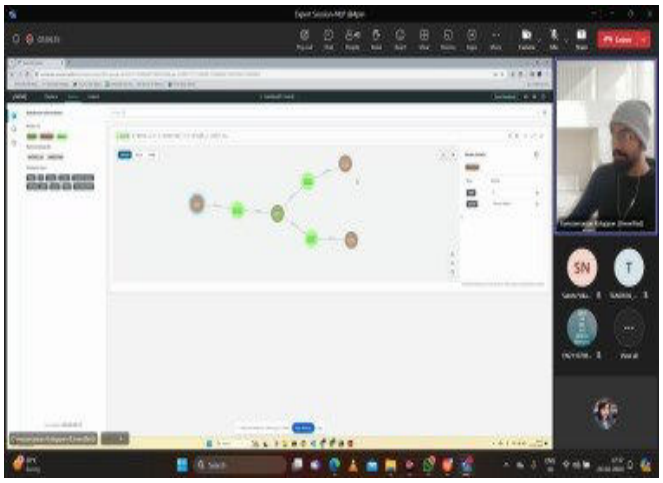
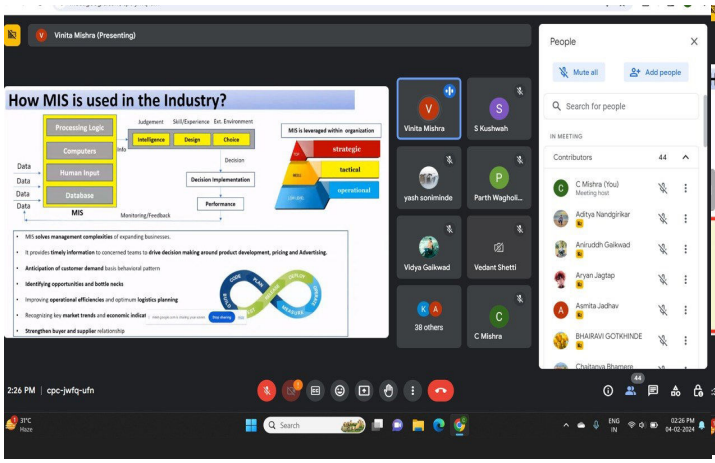
Department activities:

- Department of Artificial Intelligence and Data Science Engineering Organized Expert lecture on "Natural Language Processing (NLP) - Overview on Natural Language Processing" for Third Year students on 24th February 2024. , Mr. Ganesamanian Kolappan, Data Scientist, Advosense GmbH, Cologne, North Rhine-Westphalia, Germany, was the speaker for the session. Mrs. B. A. Tingare coordinated the session. Around 71 students attended the session.

- Department of Artificial Intelligence and Data Science Engineering Organized Expert lecture on "Management information system - Digital market analysis" for Second Year students on 4th February 2024. Mrs. Vinita Mishra , Senior manager at Amazon, was the speaker for the session. Mrs. Chandrakala Mishra and Mrs. Surabhi Kushwah coordinated the session. Around 52 students attended the session.







Some Glimpses of the session

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

Dr Vinayak Kottawar
Head of Department

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Department activities:

- The Department of Artificial Intelligence and Data Science Engineering organized a debate competition on the occasion of Science Day on 28th February 2024. Mrs. Pranjali Bahalkar and Mrs. Manasi Karajgar coordinated the event. Around 24 students participated in the competition.

Some Glimpses of the Competition

Name of Faculty Coordinator : Mrs. Trupti G. Lonkar

Dr Vinayak Kottawar
Head of Department