DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

AICTE ATAL Sponsored

5-Day Online FDP on

Artificial Intelligence (AI) on System-on-Chip (SoC)

Date: Jan. 10-14, 2022
Time: 10 am – 3.30 pm
Organizer: ECE, IIIT Delhi

Co-ordinator:

- Dr. Sumit Darak

Registration Details:

- Dates: January 10-14, 2022
- Registration Guide: https://atalacademy.aicte-india.org/assets/data/portalFlowParticipant.pdf
- Workshop number: 1614008231
- Title: AI on SoC
- Coordinator: Sumit J Darak
- Institute: IIIT Delhi
- Registration is FREE but limited number of seats are available

Day 1: January, 10, 2022 Monday

Session Details	Speaker	Topics
Session 1: 10 am – 11.30 am	Dr. Saket Anand, Associate Professor, IIIT Delhi Website: https://www.iiitd.ac.in/anands	**Introduction to Machine Learning** • Logic and Linear Regression • Gradient descent for optimization • Overfitting/underfitting and hyperparameter tuning
Session 2: 1pm – 2.30 pm	Dr. A. V. Subramanyam, Associate Professor, IIIT Delhi Website: https://iiitd.ac.in/subramanyam	**Introduction to Machine Learning** • Autoencoders • Multilayer perceptron (MLP)
Session 3: 3pm – 4.30 pm	Dr. Manjesh Hanawal, Assistant Professor, IIT Bombay Website: https://www.ieor.iitb.ac.in/mhanawal	**Introduction to Online Machine Learning** • Multi-armed bandit setup and regret • State-of-the-art algorithms

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Day 2: January, 11, 2022 Tuesday

Session Details	Speaker	Topics
Session 1: 10 am – 11.30 am	Mr. Hem-Dutt Dabral, Staff Engineer, STMicroelectronics India Website: https://www.linkedin.com/in/hem-dutt-dabral/	**Edge-AI using STM32 Ecosystem** • Introduction to STM32 • Case Study: Wireless Industrial IoT
Session 2: 1pm – 2.30 pm	Mr. Danilo Pau, Technical Director, STMicroelectronics Italy Website: https://www.linkedin.com/in/danilopietropau/	**Edge-AI** • In sensor AI Computing • Automated TinyML for hyperparameter tuning • Case Study: XCubeAI on Cifar10 for STM32 (IoT Node)
Session 3: 3pm – 4.30 pm	Dr. Sumit Darak, Associate Professor, IIIT Delhi Website: https://www.iiitd.ac.in/sumit	**Intelligent and Reconfigurable Architectures** • Evolution of SoC architectures • Hardware-software co-design • Case Study: MAB algorithms

Day 3: January, 12, 2022 Wednesday

Session Details	Speaker	Topics
Session 1: 10 am – 11.30 am Session 2: 1pm – 2.30 pm	Dr. Vipin Kizheppatt, Assistant Professor, BITS-Pilani Goa, India Website: https://www.bits-pilani.ac.in/goa/kizheppattv/profile	**Mapping DL Algorithms on Hardware via Verilog HDL** • Building blocks of DL algorithms • Implementation challenges • Tutorial: Neural network on SoC
Session 3: 3pm – 4.30 pm	Dr. Dabanjan Bhowmik, Assistant Professor, IIT Bombay Website: https://web.iitd.ac.in/~debanjan/	**Emerging Devices and Architectures for AI** • Topics to be discussed

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Day 4: January, 13, 2022 Thursday

Session Details	Speaker	Topics
Session 1: 10 am – 11.30 am	Prof. Smruti R. Sarangi, Professor, IIT Delhi Website: https://www.cse.iitd.ac.in/~srsarangi	**Theoretical framework for mapping ML algorithms to processing elements**
Session 2: 1pm – 2.30 pm	Dr. Sanjit Kaul, Associate Professor, IIIT Delhi Website: https://www.iiitd.ac.in/skkaul	**Introduction to Reinforcement Learning**
Session 3: 3pm – 4.30 pm	Rohith Rajesh, ECE, IIIT Delhi and Dr. Sumit Darak Associate Professor, IIIT Delhi Website: https://www.iiitd.ac.in/sumit	**Mapping on DL Algorithms on SoC** • LeNet-5 digit recognition on MNIST dataset • Training using PyTorch • Implementation using HLS and optimization

Day 5: January, 14, 2022 Friday

Session Details	Speaker	Topics
Session 1: 10 am – 11.30 am	Rohith Rajesh, ECE, IIIT Delhi and Dr. Sumit Darak Associate Professor, IIIT Delhi Website: https://www.iiitd.ac.in/sumit	**Mapping on DL Algorithms on SoC** • Demo on SoC • Extension to any other DL model • Tiny-YOLO Demo
Session 2: 1pm – 2.30 pm	Dr. Sneh Saurabh, Associate Professor, IIIT Delhi Website: https://sites.google.com/site/snehsaurabhhome/home	**Applications of ML in EDA** • Motivation for using AI In EDA Tools • Issues in system level design, implementation, verification and testing • Challenges and Promises
Session 3: 3pm – 4.30 pm	Mr. Sumit Nagpal Director, AI/ML Acceleration, Xilinx. Website: https://www.linkedin.com/in/sumit-nagpal-a83732/	**Vitis AI and Demo** • Introduction to Vitis AI • Vitis AI workflow and features • Demo
Exam		