

Neuromorphic Architectures

Advanced Topics on Spiking Neural Networks and their Learning Algorithms

Overview

This course will present the recent developments in neuromorphic architectures, mainly covering spiking neural networks (SNN) and their learning algorithms. It will also highlight where these systems are being used in different application areas.

The primary objectives of the course are:

- Exposing participants to the fundamentals of spiking neurons (similar to that in the brain).
- Using the spiking neuron models to develop neural network architectures that emulate the networks in the brain.
- To study the learning algorithms for spiking neural networks with special lectures on the recently developed SNN algorithms.

These lectures will provide:

- Building confidence and capability amongst the participants in the development of spiking neural networks and their learning algorithms.
- Providing exposure to practical problems and their solutions using spiking neural networks, through case studies and hands on projects.
- Enhancing the capability of the participants to use and develop SNNs and enhance the AI applications in their domains.

Dates	December 19 – December 30, 2017
Participation	Number of participants for the course will be limited to fifty on a first come first serve basis.
You Should Attend If you are ...	<ul style="list-style-type: none"> ▪ Students and Research Scholars, from institutes across the country or abroad. ▪ Young researchers in R & D laboratories of IT industries. ▪ Faculty interested in cross disciplinary research in AI, Machine learning, Neuromorphic architectures/VLSI. ▪ Faculty/researchers from Medical Colleges/Hospitals working in brain modelling/ neuro science areas.
Pre-requisite	<ul style="list-style-type: none"> ▪ Good programming skills ▪ Participants are encouraged to bring their own laptop
Fees	<p>The participation fees for taking the course is as follows:</p> <p>Participants from India: Rs.2000/-</p> <p>Participants from abroad: USD100/-</p> <p>The above fee includes training program, Wi-Fi connectivity, and computer usage for tutorials & assignments.</p> <p>Participants need to make their own arrangements for food and accommodation.</p>

The Faculty



Narasimhan Sundararajan received the B.E in Electrical Engineering with First Class Honors from the University of Madras in 1966, M.Tech from the Indian Institute of Technology, Madras in 1968 and Ph.D. in Electrical Engineering from the University of Illinois, Urbana-Champaign in 1971. From 1972 to

1991, he worked in the Indian Space Research Organization, Trivandrum, India starting as a Control System Designer to Director, Launch Vehicle Design Group contributing to the design and development of the Indian satellite launch vehicles PSLV and GSLV. He worked as the Project Engineer (Mission) for the first Indian Satellite Launch Vehicle project SLV3 team working directly under Dr. Kalam. He also was a NRC Research Associate at NASA - Ames in 1974 and as a Senior NRC Research Associate at NASA Langley in 1981-86 under the National Academy of Sciences, USA program. From 1991 to 2010 he was working in the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore as a Professor and retired from that position in July 2010. Presently, he is a Senior Research Fellow in the School of Computer Science & Engineering, NTU, Singapore. Dr. Sundararajan is a Fellow of IEEE, an Associate Fellow of AIAA and also a Fellow of the Institution of Engineers, (IES) Singapore. His research interests are in the areas of aerospace control, machine learning, neural networks and their applications and have more than 250 papers and five books in the area of neural networks.



S K Padma received her B.E in Electronic and Communication with First Class Distinction and M.Tech in Computer Engineering with First Class Distinction from the University of Mysore in the years 1984 and 1994 respectively. She obtained her Ph.D in Computer and Information Sciences from Visvesvaraya

Technological University, Belgaum in 2009. She has worked in the area of Machine learning algorithms for her doctoral thesis, more specifically RBF Neural networks and published more than 20 papers in refereed journals and conferences. She was the organizing secretary of IEEE CCIP 2016 International Conference which was held at Sri Jayachamarajendra College of Engineering, Mysore during August 2016. She is a life member of ISTE, Chair person on Board of Studies nominated by VTU, External examiner for PhD examinations

Course Co-ordinator

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