Course Relevance

Deep Learning has had a profound impact on our lives right from the voice based google search, amazon firetv recommending movies based on our interest to the very own Alexa which simplifies most of our queries however naïve they seem. Signal Processing in the deep learning/machine learning era has had a paradigm shift be it Speech, Image and Video Processing.

The focus of this course will be on introducing the broad domain of Deep Learning from Signal Processing point of view especially security related considerations. The course has been envisaged keeping in mind the beginners as well as experts in the broad area of signal processing who need a sneak preview into the domain of Deep Learning. Special emphasis will be given to open source tools like Tensor Flow, Google CoLab, Keras, Jupyter etc.

Course Objectives

- To present a comprehensive overview and understanding of Deep Learning and the current on-going research directions especially from security point of view.
- To demonstrate tools like Tensor Flow, Keras, Jupyter and Google CoLab so that the participants can get started in this domain.
- To provide useful tips for research paper writing.

Expert talks

Dr. Sumantra Dutta Roy, IIT Delhi

Dr. Richa Singh, IIT Jodhpur

Dr. K. P. Singh, IIIT Allahabad

Dr. Bidyut Patra, NIT Rourkela

Dr. Ratnakar Dash, NIT Rourkela

Dr. Manish Okade, NIT Rourkela

This course is partially sponsored by Information Security Education and Awareness (ISEA) project of MeitY, Govt. Of India.

MeitY sponsored Short Term Course on "Deep Learning Applications in Image Processing under Security ambit"

5th -9th October 2020

Co-ordinator:
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ABOUT NIT ROURKELA:

National Institute of Technology (NIT), Rourkela was founded as Regional Engineering College, Rourkela in 1961. It is a prestigious Institute with a reputation for excellence at both undergraduate and postgraduate levels, fostering the spirit of national integration among the students, a close interaction with industry and a strong emphasis on research, both basic and applied. Its been consistently ranked within TOP 20 engineering institutes for 5 consecutive years as per MHRD's NIRF, Govt. of India.

The city of Rourkela is a bustling industrial town, cosmopolitan by nature and is well connected to all parts of the country by road and rail. It is en-route Howrah-Mumbai main line of South-Eastern Railway. Nesting amidst greenery on all sides, NIT campus is approximately 7km from Rourkela railway station. The nearest airports are Jharsguda, Ranchi, Kolkata and Bhubaneswar.

Website: www.nitrkl.ac.in

https://sites.google.com/site/manishokade/

Registration Details	
Category	**Registration fee:**
Faculty/Students/ Industry Participants	**Rs. 500/-**
Registration Link: **Registration for this workshop is now closed.**	

Due to overwhelming response to the course the registration was closed in just 1 day. This is done because (MSTeam, Zoom, Gmeet, Jiomeet) do not support more than a certain number of participants. Please register here for any future workshops in this domain;

https://forms.gle/uze8vMtWuFThdNUy7

Due to COVID-19 restrictions this course will be fully online. Participation certificates and the study material will be sent via India-post to the registered participants. Registration is restricted to 60 participants on first come first serve basis.

5th October 2020:

- Introduction to Neural Networks: Basics, Multilayer Perceptron, Backpropagation Learning.
- Introduction to Deep Networks: Deep v/s Shallow.
- Introduction to Deep Learning Tools: Tensorflow, Keras, Jupyter Notebook.
- Invited Talk

6th October 2020 :

- Convolutional Neural Networks (CNN) and its details with Image applications: Block diagram, Estimating Hyperparameters, CNN examples to Image Object Recognition.
- Demo of CNN with Google Co-lab. .
- Invited Talk

7th October 2020 :

- Recurrent Neural Networks (RNN): Overview, Applications to Security
- Transfer Learning: Concepts, Applications
- Demo of Transfer Learning with Google Co-lab.
- Invited Talk

8th October 2020 :

- Reinforcement Learning: Overview, Applications to Security
- Demo of Reinforcement Learning with Google Co-lab.
- Invited Talk

9th October 2020 :

- Deep Learning in Video Analytics
- Art of research paper writing