SEMINAR NOTICE

Speaker:

Dr. Susmita Ghosh (De)
Professor,
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Jadavpur University,
Kolkata 700032, INDIA

Research Interests: Pattern Recognition, Image and Video Analysis, Data Mining, Evolutionary Computing and Swarm Intelligence, Neural Networks, Soft Computing

Date: June 11, 2018
Time: 11:00 am
Venue: Seminar Room

Brief Bio:

- Ph.D.   2004   Jadavpur University, Kolkata
- M.Tech ,   1994   Indian Institute of Technology, Bombay
- Around 80 papers and co-authored 9 Books / Book Chapters
- Awards
  - European Commission (India4EUII) fellowship   2014
  - UNESCO   CIMPA-UNESCO-INDIA fellowship   2002
  - UNESCO   CIMPA-UNSA-UNESCO-CHINA fellowship   1999
  - Govt. of India National Scholarships   1998
  - Department of Atomic Energy, Govt. of India, Dr. K. S. Krishnan Fellowship as a Senior Research Fellow   1997
- Guided 6 PhD thesis and many post-graduate dissertations
- PI to 8 projects funded by DST, AICTE, European Union amounting to 6.0 crores
- Google Scholar Citation for last 5 years

	Since 2013
Citations	890
h-index	15
i10-index	22

Title: Remotely Sensed Image Analysis using Machine Learning Methodologies
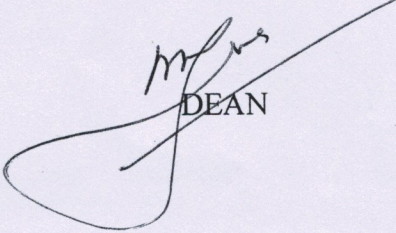
Dr. Ghosh has developed computational models in the context of neural networks, evolutionary algorithms, swarm intelligence, fuzzy logic & neuro-fuzzy techniques, and demonstrated their success for various tasks in pattern recognition and image analysis including remotely sensed and video image analysis.

In remote sensing applications, change detection is a process aimed at identifying differences in the state of land-covers. This plays an important role in various domains like study of land-cover dynamics, monitoring shifting cultivations, burned areas assessment, analysis of deforestation processes, monitoring of urban growth etc. Various kinds of artificial neural networks (and their semi-supervised counter parts), including Hopfield's model, Kohonen's self-organizing feature map and multi-layer networks have been used to solve this problem. Ensemble of networks and active learning strategies are also explored. These systems are very robust and do not require any apriori knowledge about the distribution of the changed regions. These are found to provide accurate prediction of burned forests and flooded areas in LANDSAT images.

The problem of change detection involves handling uncertain and overlapping data. Study is in progress to manage this uncertain and overlapping data with fuzzy sets and fuzzy logic.

Hyperspectral image analysis has gained popularity now a days. Due to the presence of large number of bands, classification of hyperspectral images becomes computation intensive. Moreover, higher correlation among neighboring bands increases the redundancy among them. As a result, dimensionality reduction (band elimination) becomes very essential. A supervised feature selection technique guided by evolutionary algorithms is developed for feature subset generation. An unsupervised band elimination method is also developed which iteratively eliminates one band from a pair of most correlated neighboring bands depending on discriminating capabilities. Clustering and ranking based unsupervised method is also designed to deal with the same task.

Dr. Ghosh is a part of an ongoing International Project under Indo Norwegian collaboration program which aims in detecting faults in power systems (combined heat and power micro gas turbine) using machine learning tools.

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