**Joint Chapter of IEEE Computational Intelligence, Geoscience & Remote Sensing Societies**
**IEEE Hyderabad Section**
**Presents**
**6-Day Summer School 2018 on**
**Computational Intelligence: Theory, Implementation & Applications**
**22-27 November 2018**

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# Chairs



Atul Negi, Program Chair
IEEE CIS Summer School 2018



M. Naresh, Program Co-Chair,
IEEE CIS Summer School 2018
Chair CIS/GRSS Jt. Chapter, Hyd Section

**About the Chapter:** The IEEE Computational Intelligence Society Hyderabad Chapter is TWICE identified as the Outstanding CIS Chapter for the year 2013 & 2016. This award is being given for the outstanding contributions to IEEE CIS for the greatest overall contribution and service to its members; the local scientific, professional, governmental, and educational communities; and the IEEE CIS. This recognition served as the motivation for the society to launch IEEE CIS sponsored Summer School in Hyderabad, India.

**Brief about the Summer School:** The A 6-day IEEE Computational Intelligence Society Summer school was conducted at MJCET, Hyderabad from 22-27 November 2018. The event was financially supported by IEEE CIS Society, IEEE GRSS Society, IEEE Hyderabad Section and the host institute MJCET. A total of 50 participants had participated out of which 15 participants were from the other states like Chattisgarh, Uttrakhand, Mumbai, Karnataka, Andra Pradesh etc. Two workshops have been organized in two different places as PRE-EVENT activity to motivate the participants and to provide the prerequisites of this summer school. Poster presentations, Hands-on sessions, Demonstrations and local tours for Technology HUB had differentiate this Summer School from other events. The program was widely covered by both print and electronic media.

**Pre-Events:** In order to encourage the participation in summer school, following two pre events were conducted by CIS counters, IEEE Hyderabad section.

- Two-Day National Level Workshop on 'Artificial Intelligence and Machine Learning (AIM 2018)', conducted by GPREC, IEEE Information Theory Society Student Chapter, Kurnool, 24-25 Sept 2018
- Two-Day National Level Workshop on 'Machine Learning using Python' organized by IEEE Hyd Section in collaboration with IEEE Anantapur sub-section at JNTUACE Kalikiri, AP, 6-7 Oct 2018

**Following are the Eminent Speakers from all parts of the world:**

- Dr. P.N. Suganthan, NTU, Singapore
- Dr. J. Sarangapani, Missouri Univ. of Science & Technology, Rolla, USA
- Dr. Risto Miikkulainen, Univ. of Texas, USA
- Dr. Janez Brest, Univ of Maribor, Slovenia
- Dr. M. Pratama, NTU, Singapore
- Dr. Sabrina Senatore, Univ. of Salerno, Italy
- Dr. Anand Parey, IIT Indore
- Dr. Akira Hirose, Univ. of Tokyo, Japan
- Dr. Farookh Hussain, Univ. of Technology, Sydney, Australia
- Dr. Avik Bhattacharya, IITB, Mumbai, India
- Dr. Ashish Ghosh, ISI Kolkata, India
- Dr. Alok Singh, Univ. of Hyderabad, India
- Dr. Tilottama Goswami, Professor, BVRIT, Hyderabad (Hands-on Sessions)
- Dr. Srija Katta, Vyas Labs, Hyderabad (Hands-on Sessions)

## 22nd November:

This magnificent event was Inaugurated in the gracious presence of the **Chief Guest Dr. P.N. Suganthan,** Professor, Nanyang Technological University, Singapore and the **Guest of Honor Dr. Sabrina Senatore,** Professor, University of Salerno, Italy along with the Chairman of IEEE Hyderabad Section, Chairs of the event, Chapter leadership and Special invitees from the Host institute.



Glimpses of the Inaugural Ceremony



John McCarthy Memorial Lecture (Flagship event of IEEE CIS Chapter, Hyderabad) has been organized as the first lecture of this Summer School. Prof. **P. N. Suganthan,** Nanyang Technological University, Singapore delivered an excellent talk on "***Non-iterative Learning Algorithms***".

**Suganthan** delivered another lecture on "***Numerical Optimization by Swarm and Evolutionary Algorithm***".

Memento presentation by Prof. Atul to Dr.P.N Suganthan

**Dr. Sabrina Senatore** had delivered two lectures on "Soft computing perspective for knowledge extraction and modeling".

The lectures were quite informative, covering from the basics till the applications. The basic elements of Soft Computing techniques fuzzy theory, Evolutionary computing and Machine Learning were explained in detailed.



Dr. Sabrina Senatore

## 23rd November:

The second day of the school had 5 Lectures focusing on the theory and applications of various Computational Intelligence methods.

Artificial Bee Colony Algorithm and It's Applications – By Alok Singh, University of Hyderabad.

Towards intelligent Blockchain – Confluence of Blockchain and Artificial Intelligence- By Dr. Farooq Hussain, UTS Sydney

Evolving Neural Networks – By Dr. Risto Miikkulainen, Univ. of Texas, USA.

Neural network based techniques for change detection in remotely sensed images – By Dr. Ashish Ghosh, ISI Kolkata

Autonomous Construction of Deep Neural Networks for Lifelong Learning of Nonstationary Data Streams (DEVNN) – By Dr. M. Pratama, NTU, Singapore



Dr. Naresh presenting a memento to Dr. Alokh Singh



Dr. Farooq Hussain



Dr. Risto Miikkulainen's Lecture over SKYPE

Dr. Asish Ghosh



Dr. Prathama

**Poster Presentation:**

Four posters were presented by the participants in the Afternoon Session. The speakers and fellow researchers had fruitful interactions with the authors of the posters. The posters were made available in the remaining days and all the participants were allowed for deliberations during Tea Brakes.

- Trajectory Tracking Modelling of a Quadcopter Using Fuzzy Logic Intelligent Control Technique – By Pramit Singhi et.al.
- Vision Based Autonomous Navigation of Quadcopter using Reinforcement Learning – By Akshay Walvekar et.al.
- Binary Tree based Partitioning approach to Decision Tree classification – By Shankru Guggar
- Development of Flexible Autonomous Car System Using Machine Learning and Blockchain - By Enoch Arul Prakash









Dr. Janez, Dr. Prathama, Dr. Atul Negi and Dr. Tilottama along with the Other attendees @ Poster Session.

Dr. Janez had explained the history of Differential evolution algorithms. He also explained Single objective & Multi Objective DE concepts with self-adaptive control parameters. Some applications of DE in animations in constructing the 3D images of growing trees and generating synthetic forests etc. were also demonstrated.

In this second talk he explained the applications of Differential Evolution techniques to solve complex combinatorial problems.



Dr. Janez Brest



Dr. Naresh presenting a memento to Dr. Asish Ghosh

Dr. Ashish Ghosh had explained the concepts of Perceptron, Mutli-layer neural networks, back propagation algorithm for training the Neural networks. The motivation for Deep Learning was presented in an appreciable manner. The speaker also explained the applications of Supervised and Unsupervised methods for dimensionality reduction and change detection in remotely sensed images.

Two interesting lectures were presented by Dr. Prathama. One on "An Incremental Construction of Deep Neuro Fuzzy System for Continual Learning of Nonstationary Data Streams" and the second was on "PAC: A Novel Self-Adaptive Neuro Fuzzy Controller for Micro Aerial Vehicles". The illustrations and the detailed explanation on tuning the parameters for continuous learning were impressive. The motivation for autonomous construction of DNN and some advanced concepts like Deep evolution NN, Autonomous Deep Learning and Incremental DNN were also discussed.



Dr. Prathama

The last presentation of the day was by Prof. Jagannath Sarangaani from Missouri University of Science & Tech. USA. The talk was on "Optimal adaptive Control Using Approximate Dynamic Programming". Though it was the last lecture, the presentation with real time examples, demonstrations and video presentations made the lecture very interesting.

Dr. Jagannath Sarangapani

## 25th November:



Prof. Jagannath Sarangaani delivered the first talk of the day on "Direct Error Driven Deep Learning". He explained the BIG DATA Problem in Control applications. The recent works on error driven learning and the necessary proofs were discussed in detailed. The query and answer session was very productive with the active discussion by all the participants.

A memento being presented to Dr. Sarangapani.
(From left to Right) Dr. Atul, Prof. Sarangapani, Dr. Naresh and Dr. Hitendra

Dr. Janez Brest delivered another talk on "Differential evolution and continues optimization problem (protein folding)".

Dr. Anand Parey, IIT Indore on "Gearbox fault diagnosis using vibration monitoring and ANN".

Both lectures were well received and thought provoking for the young researchers.



Dr. Naresh, Dr Atul , Dr. Anand Parey and Sri Maruthi, IEEE HYD Section Chair (from left to Right)

The applications of Computational Intelligence in Geoscience and Remote Sensing areas were also discussed at length. Prof. Avik Bhattacharya of IITB, Mumbai had delivered a talk on "Polarimetric SAR Image Analysis: Physics to Machine Learning". This lecture had made the participants to explore the suitable applications of Machine Learning like classification, regression and clustering techniques in analyzing the SAR Images.
**Dr. Naresh presenting a memento to Dr. Avik**
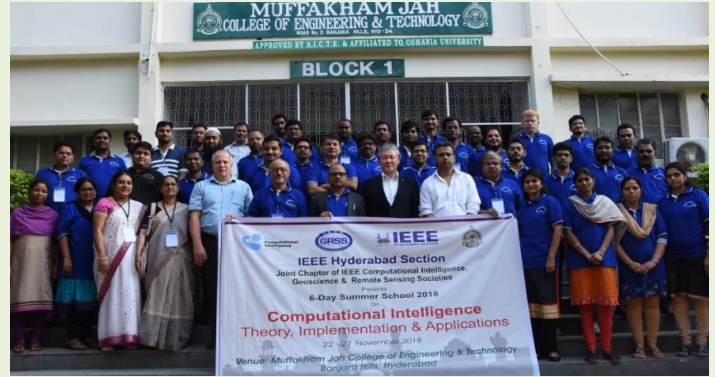




Dr. Tilottama, Dr. Janez, Dr. Atul Negi, Dr. Naresh, Dr. Akira, Dr. Avik Bhattacharya and the participants

Hands-on sessions were organized by Dr. Tilottama Goswami to provide an overview of Datasets and Tools to be used in the subsequent laboratory tasks. All the lecture contents and the Codes of all the algorithms which were discussed during the lectures were shred to all the participants through Moodle.

Dr. Madhav Negi, Executive Committee Member, IEEE Hyderabad Section had given a presentation on IEEE Membership Benefits and other opportunities like IEEE Collabratec, IEEE Tv and Job Portal etc., for the IEEE members.

A banquet dinner and a cultural program were organized on the theme of Indian cultural. Students performed traditional dance like Bharatanatyam, Kuchipudi and Instruments which made the evening a memorable one.



Resource persons, Students, IEEE CIS Chapter Execom Members, Dignitaries from MJCET and IEEE Hyderabad Section Officials @ Cultural Program

## 26th November:

Dr. Akira Hirose, University of Tokyo, Japan, delivered two lectures. First lecture on "Advanced Neural Adaptive Processing in Interferometric and Polarimetric Radar Imaging: I. Basic concept of complex-valued neural networks for complex-amplitude information processing" and the second lecture was on "Advanced Neural Adaptive Processing in Interferometric and Polarimetric Radar Imaging: II. Quaternion networks for polarization information processing III. Structurization of SAR data". The great knowledge of the speaker in the applications of CI techniques in Radar Image Analysis helped the participants to explore the research avenues in this area.



Dr. Akira Hirose with the organizing committee members
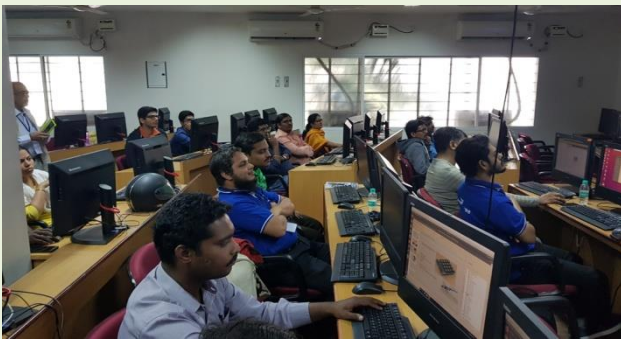


Participants @ Laboratory

Productive hands-on session was conducted by Dr. Srija Katta on "AI Applications in Health Care", followed by Dr. Tilottama Goswami on "Fuzzy Logic practice using python".

## 27th November:

Dr. Akira delivered another talk on "Advanced Neural Adaptive Processing in Interferometric and Polarimetric Radar Imaging: Self-organizing map for adaptive grouping in ground penetrating radars".

All the sessions were highly interactive, lively and interesting and credit goes to all the participants and the speakers.



Participants @ t hub, Hyderabad

A local tour was organized to visit **T-Hub (Telangana Hub)** (India's largest incubator for startups) to get the exposure of real time implementation of Artificial Intelligence, Machine Learning and other latest technologies. **T-Hub** It is community space for start-ups, investors, incubators and accelerators in India.

The event concluded with a valedictory function. During the function the following addressed the gathering:

- **Dr. Akira Hirose,** University of Tokyo, Japan.
- **Dr. Janez Brest,** University of Maribor, Slovenia
- **Dr. Atul Negi**, Program Chair
- **Dr. M. Naresh**, Program Co-Chair & Chair, CIS/GRSS Jt. Chapter, IEEE Hyderabad Section
- **Dr. Mousmi Ajay Chaurasia,** Professor & Head IT dept, MJCET

Finally, certificates of participation were presented to all participants. Day- wise feedback and an overall event feedback were taken by the participants through Moodle services. It has been excellent and were asked to organize more such events in the future.



Certificate Distribution @ valedictory function

## *Budget Details:*

| Income | |
|---|---|
| Registration : | 198087 |
| IEEE Hyderabad Section: | 75000 |
| MJCET: | 100000 |
| IRC fund: | 50000 |
| CIS award money: | 84000 |
| CIS SS fund 8000$ | 548160 |
| GRSS SS fund 3000$ | 205560 |
| **TOTAL** | **1260807** |
| **Expenditure** | **1260440** |
| **Extra Expenses incurred** | **367** |

***Note of Appreciation…***

*The motive of the program has been successfully achieved and all participants were highly satisfied with the sessions. 80% membership growth was expected in IEEE CIS and GRSS chapters.*

*Entire organizing team had put all their efforts to set this milestone. Everyone has set their sights high and made every effort leading to grand success.*

**Venue:** Muffakham Jah College of Engineering & Technology, Hyderabad (M.J.C.E.T) It is located at Banjara hills in the heart of the city and one of the prime locations in Hyderabad. MJCET campus is one the most happening places in Hyderabad with many IEEE student chapter activities. It is covered by lush green gardens almost everywhere.

## Brochure& Schedule link:
https://drive.google.com/drive/folders/1MwLg3oHqUsciVWfNvXUL8sHhok2Xt3gN?usp=sharing