Machine Learning Applications to Internet of Things

Course Dates: 16-12- 2017 to 22-12-2017

Overview

The increasingly connected world, combined with devices that are producers and consumers of information, low-cost sensors, and distributed intelligence whose interaction will be facilitated by the Internet of Things (IoT) and will have a transformative impact on industry, producing more data than humans will be able to process. IoT is growing rapidly in decades, various applications came out from academia and industry. IoT is an amazing future to the Internet, but there remain some challenges to IoT for human have never dealt with so many devices and so much amount of data. Machine Learning (ML) can also help machines, millions of machines, get together to understand what people want from the data made by human beings. It is defined as the ability of a machine to vary the outcome of a situation or behavior based on knowledge or observation which is essential for IoT solutions. Over time, its focus evolved and shifted more to algorithms which are computationally viable and robust. machine learning techniques have been used extensively for a wide range of tasks including classification, regression and density estimation in a variety of application areas such as bioinformatics, speech recognition, spam detection, computer vision, fraud detection and advertising networks. The algorithms and techniques come from diverse fields including statistics, mathematics, neuroscience, and computer science and used even boarder, or most areas related to machines nowadays. Also, ML plays an essential role in IoT aspect for handling the huge amount of data generated by those machines. Machine learning gives IoT and those machines a brain to think, which is called "embedded intelligence".

Course Details	
	Day1 ➢ Enabling technologies for IoT ➢ Architectures for the IoT ➢ IoT communication and networking ➢ Network access protocols for IoT **Day 2** ➢ Representative IoT applications ➢ Challenges to realizing the IoT ➢ Security challenges in the IoT ➢ Security solutions in the IoT **Day 3** ➢ Energy Introduction to ML ➢ Bayesian Statistics ➢ Classification Clustering ➢ Dimensionality reduction

	Day 4 ➢ Geospatial analysis ➢ Reinforcement Learning ➢ Deep learning **Day 5** ➢ Concepts of IoT Analytics ➢ Cloud computing for IoT ➢ Fog computing **Day 6** ➢ Concepts of IoT Analytics ➢ Cloud computing for IoT ➢ Fog computing **Number of participants for the course will be limited to forty.**
You Should Attend If…	➢ Scientists/Engineers from Industry and government R&D laboratories, engineering/science departments ➢ Students at the levels: BTech/MTech/PhD ➢ Faculty from academic and technical institutions of India.
Fees	The participation fees for taking the course is as follows: **Participants from abroad: US $500** **Industry/ Research Organizations: Rs. 6000/-** **Academic Institutions: Rs. 3000 /-** **Research Scholar participants: Rs. 1,000/-** **B.Tech/M.Tech students: Rs. 500/-** On request, accommodation will be provided for few participants (depending upon availability) in the campus on payment.
How To Register	**Stage1:** Web (Portal) Registration: Visit http://www.uceou.edu/gian/ and create login user ID and Password. Fill up blank registration form and do web registration by paying **Rs. 500**/- on line through Net Banking/ Debit/ Credit Card. This provides the user with life time registration to enroll in any no. of GIAN courses offered. (If you have already registered in GIAN portal you can skip this step.) **Stage2:** Course Registration (Through GIAN Portal): Log in to the GIAN portal with the user ID and Password already created in Step 1 Click on "Course Registration" option given at the top of the registration form. Select the Course titled **"Machine Learning Applications to Internet of Things"** from the list and click on "Save" option. **Confirm your registration by Clicking on "Confirm Course".**

Dr. Biplab Sikdar - Course Faculty

Dr. Biplab Sikdar received Ph.D in electrical engineering from Rensselaer Polytechnic Institute, Troy, NY, USA and MTech degree in electrical engineering from Indian Institute of Technology, Kanpur in 2001 and 1998, respectively. He is an Associate Professor in the Department of Electrical and Computer Engineering, National University of Singapore, Singapore. He held a Verifone Fellowship during his studies in IIT Kanpur and was awarded the Charles M. Close doctoral award at Rensselaer Polytechnic Institute. He has also been awarded the Tan Chin Tuan fellowship from Nanyang Technological University, Singapore.

Dr. Hari Prabhat Gupta, Course Coordinator

Dr. Hari Prabhat Gupta is an Assistant Professor in the Department of Computer Science and Engineering, Indian Institute of Technology (BHU) Varanasi, INDIA. Previously, he was a Technical Lead in Samsung R&D Bangalore, India. He received his Ph.D. and MTech degrees in Computer Science and Engineering from Indian Institute of Technology Guwahati in 2014 and 2010 respectively; and his B.E. degree in Computer Science and Engineering from Govt. Engineering College Ajmer, India. His research interests include applications of Machine Learning, Wireless Sensor Networks (WSN), Mobile Ad-hoc Networks(MANET), and Human-Computer Interaction (HCI).

Dr. Tanima Dutta, Course Co-host

Dr. Tanima Dutta is an Assistant Professor in the Department of Computer Science and Engineering, Indian Institute of Technology (BHU) Varanasi, India. Previously, she was a Researcher in TCS Research & Innovation, Bangalore, India. She received Ph.D. in Dept. of Computer Science and Engineering, Indian Institute of Technology (IIT) Guwahati in 2014. She has completed her B.Tech. and M.Tech. Degrees in CSE and IT in 2005 and 2010, respectively. Her Ph.D was supported by TCS (Tata Consultancy Services) Research Fellowship and she received SAIL (Steel Authority of India Limited) Scholarship for perusing her B.Tech. Degree. Her research interests include applications of Machine Learning, Digital Media Forensics, Vision and Graphics, Human Computer Interaction, and Ubiquitous Computing.

Location

Department of Computer Science and Engineering
Indian Institute of Technology (Banaras Hindu University),
Varanasi, Uttar Pradesh- 221005, India

Course Duration

One Week: 16-12-2017 to 22-12-2017

Course Coordinator

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Course Registration link

http://www.uceou.edu/gian/