

# THEORETICAL AND PRACTICAL ASPECTS OF THE INDUSTRIAL INTERNET OF THINGS

---

## Overview

Industrial Internet of Things (IIoT) or Industry 4.0 is a very recent trend to interconnect industrial computers, sensors and actuators using Internet technologies. It extends the industrial networks to the global Internet to improve observability and controllability of industrial processes and applications, calling for efficient, safe and secure protocols and solutions. This course covers recent technical developments and actual and future research questions around the IIoT, which clearly is interdisciplinary. It covers an advanced introduction into the overall (and rapidly changing) architectures of distributed and multi-stage computing, into the protocols being used in Industrial communication, and into actual and future research questions in the field of scalability, security, network management, and machine learning for autonomous applications. The course will include specific case studies on selected applications and thus, will also give an insight into industrial collaboration in Germany's high-tech industries. This advanced-level course will help students to interconnect and advance their basic knowledge about computer networks, embedded systems, control theory, and security. Students will learn about relevant protocols and technologies, which will be presented. The labs and self-learning phases will help them to deepen this theoretical knowledge.

## Objectives

The primary objective of this course is to introduce and familiarize participants with:

- Current state of the art in Industrial Internet of Things (IIoT) architectures, protocols, and technologies.
- Advanced technological problems of IIoT concepts and solutions.
- Practical applications of IIoT on local embedded system, gateway and cloud side.

<b>Dates</b>	<ul style="list-style-type: none"> <li>• <b>5 February 2018 -16 February 2018.</b></li> <li>• <b>Number of participants for the course will be limited to fifty.</b></li> <li>• <b>Registration is on first come, first serve basis and space is limited.</b></li> </ul>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ Research Scholars, Graduate students, Computer Science researchers and graduate students from different institutes across the country.</li> <li>▪ Researchers in R &amp; D laboratories of IT industries.</li> <li>▪ Faculty and academics interested in cross disciplinary research in Automation, Communications, and Intelligent Computing.</li> </ul>
<b>Pre Requisite</b>	<ul style="list-style-type: none"> <li>▪ Good knowledge in embedded programming (ANSI-C)</li> <li>▪ Good knowledge in computer networks</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows: Participants from:</p> <ul style="list-style-type: none"> <li>• Abroad : US \$100</li> <li>• Students / Industry / Academic Institutions / Research Organization: Rs. 2000.00</li> <li>• Participants from Host Institution: Rs. 1000.00</li> <li>• The above fee includes training program, Wi-Fi connectivity, and computer use for tutorials, assignments etc.</li> </ul>
<b>General Information</b>	Participants are encouraged to bring their own laptop. Also participants need to make their own arrangements for food and accommodation.

## The Faculty



**Prof. Dr.-Ing. Axel Sikora** holds a diploma of Electrical Engineering (Dipl.-Ing./M.Sc.) and a diploma of Business Administration (Dipl. Wirt.-Ing., MBA), both from Aachen Technical University. He has done a Ph.D. in Electrical Engineering at the Fraunhofer Institute of Microelectronics Circuits and Systems, Duisburg, with a thesis on SOI-technologies. After various positions in the

telecommunications and semiconductor industry, he became a professor at the Baden-Wuerttemberg Cooperative State University Loerrach in 1999. In 2011, he joined Offenburg University of Applied Sciences, where he is scientific director of the Institute of Reliable Embedded Systems and Communication Electronics (ivESK). Since b/o 2016, he is also deputy member of the board and head of the division "Software Solutions" at Hahn-Schickard Association of Applied Research (Germany), one of the leading research institutions around Industrial Internet of Things (IIoT). In 2002, he founded the Steinbeis Transfer Center Embedded Design and Networking, which was successfully spun off as STACKFORCE GmbH in 2014.

His major interest is in the system development of efficient, energy-aware, autonomous, secure, and value-added algorithms and protocols for wired and wireless embedded communication.

He is member of the steering, program or advisory boards of many international conferences and workshops, including being Conference Co-Chairman of the annual Embedded World Conference, the largest conference worldwide on the topic. He is author, co-author, editor and co-editor of several textbooks and of around 150 peer-reviewed papers.



**Dr. V.N. Manjunath Aradhya** received the M.S. and Ph.D degrees in Computer Science from University of Mysore, Mysuru, India, in 2004 and 2007 respectively. He did his Post Doctoral from University of Genova, Italy in 2010. He is currently working as an Associate Professor in Dept. of MCA,

Sri Jayachamarajendra College of Engineering, Mysore. He is a recipient of "Young Indian Research Scientist" from Italian Ministry of Education, University and Research, Italy in 2009. Also awarded as "Young Scientist" from the Department of Science and Technology (DST) in 2009 under FAST TRACK SCHEME. He successfully completed two major research projects one from DST and another from AICTE.

His research interest includes, Pattern Recognition, Image Processing, Internet of Things (IoT), Document Image Analysis, Computer Vision, Machine Intelligence, Applications of Linear Algebra for the Solution of Engineering Problems, Biclustering of Gene Expression Data and Web Data Analysis and Understanding. He is currently guiding six Ph.D's and completed four Ph.D's. He has published more than 80 research papers in reputed International Journals, Conference proceedings, and edited books.

### Course Co-ordinator

**Dr. V.N. Manjunath Aradhya**  
Associate Professor  
Dept. of MCA  
Sri Jayachamarajendra College of  
Engineering  
Mysuru - 570006.  
Phone: +91-98868 96108  
E-mail: aradhya@sjce.ac.in

.....  
<http://www.gian.iitkgp.ac.in/GREGN>