Nordic IoT News

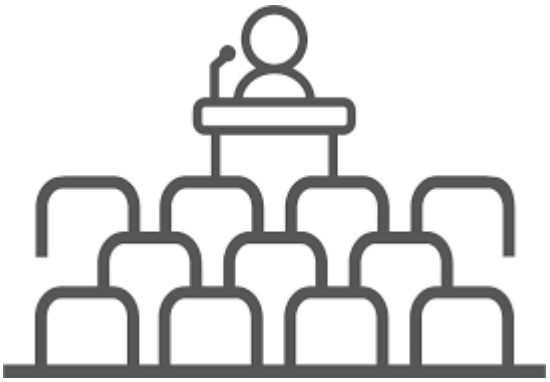
No. 2-2019

Two Summer schools completed

Mid-June the Nordic IoT center completed two Summer schools:

The *Summer School on Cyber Physical Systems* took place on June 10-14 at KTH, Stockholm. The integrative thread throughout the Summer School was provided by industrial examples – case studies – that were provided the first day, and through the theme of trustworthy autonomous CPS. The red thread was maintained by daily reflections, discussion sessions and exercises – to revisit the topics treated, bring up open problems and questions – promoting dialogue and learning. Invited speakers and additional experts was joining these sessions to take part in the discussions and provide further insight into ongoing research and state of the art. The course was well attended (32 participants) and our students could receive 2.0 – 4.0 ECTS points (based on related homework).

The *Nordic IoT Summer School on Edge and Fog Computing* took place on June 17-21 at DTU, Lyngby. This course was attended by 22 students with a possible credit of 2.0 ECTS. Also, this Sumer school was a mix of industrial and theoretical presentations. The summer school is a successor to two traditions: the DTU summer session on embedded computing and Georgia Tech summer schools on IoT and CPS. We were very pleased to have professor Marilyn Wolf from Georgia Tech as a key note and facilitator for the sessions.



New activities

In the most recent board meeting it was agreed to initiate three new Hub activities, namely:

Collect information on available IoT equipment among the partners

All information will be gathered in the shared Google drive. Information collected includes, among other: availability, instructions required to use the equipment, can it be shared by another department, benchmarks, use cases.
It is our intention that all PhD students affiliated to the Hub can get access to the equipment. Whenever a Hub student exploits the equipment, they will be encouraged to share their use cases, data sets and possible benchmarks within the Hub

An IoT Ambassadors programme

In this programme we will motivate the PhD students to share their knowledge across the departments involved in the Hub. This could be done by giving presentations at regular department meetings, mingle with fellow students, setting up thematic days/workshops, etc.
This action will be coordinated by Dr. Bahram Zarrin – baza@dtu.dk

Distinguished Nordic IoT lecturer programme

In this programme, coordinated by Associate professor Xenofon Fafoutis (xefa@dtu.dk) we will promote and share e.g. invited lecturers across the borders. This could be done by financially supporting their Hub visits or by sharing their presentations enabled by the Logitech Zoom equipment demonstrated during the Yearly meeting in Otaniemi.

The Hub at Folkeuniversitetet (Danish University Extension)

On 20 May, the Hub gave a public presentation at Folkeuniversitetet in Copenhagen on the subject "Internet of Things – Things' internet". The presentations addressed the potential impact of IoT and how it together with the 5G network would impact all citizens' lives. The arrangement attracted 40 participants and created a lively debate.

Hub students at DTU support business

A number of PhD students from the DTU-Photonics department are supporting LEKON, a small company's implementation of IoT for asset tracking by means of e.g. localization/identification, user records, user manuals and maintenance/calibration issues. The LEDOC system developed by LEKON A/S has been on the market for more than ten years. However, by utilizing IoT they can add more intelligence to the system. The students are currently investigating what kind of network(s) they should use for the tracking system, e.g. Sigfox, LoRa, Narrow band IoT, RFID, GPS, etc. A full implementation of the module from LEKON will be on the market within the next year.

Hub posters available from the co-ordinator

A new set of promotional posters have been drafted by DTU. The posters promote the Nordic Graduate School by showing the list of available doctoral courses/summer schools, the current list of associated PhD projects, examples of industrial IoT applications and a profile of the innovative Nordic region. A QR code facilitates the access to further Hub info (see the last page of this newsletter).
The posters are available from the shared Google drive.

Mobility status

During the Yearly meeting at Aalto two poster sessions were organized within Fog/edge computing and Cloud computing. Most of our students active in these areas presented their work with a focus on progress and collaboration opportunities related to their thesis work. Especially, the students were encouraged to pursue mobility schemes between the various research groups.

These mobilities are now starting to take off, e.g.:

LTH-Aut visited DTU-Compute to work on a joint paper
DTU-Photonics visited NTNU to see their IoT deployment looking for some potential collaboration in the future
DTU-Photonics visited LTH in December 2018 sharing research knowledge
DTU-Photonics (two students) will visit LTH for a month to continue their work on LP-WAN modelling
LTH to visit DTU-Compute/Photonics to work on a SSIoT collaboration project
DTU-Compute visited Shanghai University to explore cooperation possibilities (a report will appear in the shared Google drive.
Many more visits are currently being planned.

New PhD students associated with the Hub

Four new PhD students have been associated with the Hub. Please welcome:

- Haorui Peng, LTH: Design, optimization and control of self-driving networked systems
- Zarah Chamideh, LTH: Optimization and control of networked systems for autonomous vehicle applications
- Fatemeh Akbarian, LTH: Ultra-reliable and low-latency networked systems aimed for time-critical services in an Industry 4.0 environment
- Constantina Ioannou, DTU: Neoro-adaptive Digital Learning

In total we now have 40 PhD students affiliated to the Hub meaning that their Hub activities are eligible for funding. Please visit http://www.nordic-iot.org/doctoral-school/list-of-affiliated-phds/ for a complete list of students.

We wish all our students and faculty members a nice Summer!

NordForsk

The Nordic Graduate School on Industrial IoT

Make your PhD programme in one of five Nordic universities and take advantage of joint courses, labs and IoT test facilities

Examples of doctoral courses/summer schools

Ph.D. Course in Design of Mobile Backhaul Networks 5 ECTS)
Network technologies and application development for IoT (5 ECTS)
IoT prototyping. Proof of Concept for your Telecom IoT Project
Topics on Network Anticipation and IoT within 5G
Nordic IoT Summer School: Edge and Fog Computing (2.5 ECTS)
The Summer School on Cyber Physical Systems (2.0/4.0 ECTS)
Societal Challenges and Industry
Fog computing and network
Ressource management and middleware in the fog
Smart cities summer school

www.nordic-iot.org

NordForsk

The Nordic Graduate School on Industrial IoT

Current PhD projects on IIoT:

- Resource Management in Fog Computing for Industrial Applications
- Edge computing
- Digital twins
- Distributed machine learning at the edge
- Intersection of cloud computing, telecom, and control theory
- Control-based resource management in the distributed cloud
- Feedback Control in Cyber-Physical Systems
- Mission critical cloud
- Autonomous learning camera systems in resource constrained environments
- Autonomous Systems and Software
- Event-Based Cloud Control
- Event-Based Control and State Estimation
- State estimation and motion planning of non-linear systems
- Efficient user generated information management
- Energy conservation in 5G networks using DRX
- Latency Critical Networking
- Reliable Architecture for Future Smart Communities
- 5G Mobile Networks Optimization using Cloud-RAN architecture
- Optimisation of future mobile communication systems using Deep Learning
- Security in Fog Computing
- Open source Fog Node: hardware support for virtualization
- Distributed real-time operational data analytics
- Information security for operational safety in Industry 4.0 based production
- Future Scenarios and Value Network Configurations for Industrial 5G
- Data Analytics for Cyber-physical Systems: Current Situation and Strategies for Action
- Smart Manufacturing
- Towards a service-oriented framework supporting MBSE tool-chain development
- Next generation SDN/NFV-based Management of Service
- Security for embedded real-time systems
- Machine Learning for Autonomous Data Centers
- 5G-based steering of Unmanned Aerial Vehicles
- Mobile Network enabled UAVs for the delivery of IoT services
- Communication in Real-Time Multicore Systems
- Fog Computing Security
- Configuration of Autonomous Vehicle System Platforms for Safety-Critical Applications
- Design, optimization and control of self-driving networked systems
- Optimization and control of networked systems for autonomous vehicle applications
- Ultra-reliable and low-latency networked systems aimed for time-critical services in an Industry 4.0 environment

NordForsk

The Nordic Graduate School on Industrial IoT

Innovation in the Nordic countries

With a long tradition of supporting innovation behind them, the Nordic countries have always been pacesetters when it comes to innovation-based development, topping the rankings of the most innovative economies in the European Union (EU).

According to the Regional Innovation Scoreboard, Stockholm is the most innovative region in the EU, followed by the capital region of Denmark.

The EU 2020 target aims at 40% of 30–34 year olds with a tertiary level qualification. The Nordic average is currently 49% (Eurostat, 2017).

NordForsk

The Nordic Graduate School on Industrial IoT

Industrial IoT Applications

Aalto University, FI
Lund University, SE
Norwegian University of Science and Technology, NO
Royal Institute of Technology, SE
Technical University of Denmark, DK

NordForsk