LUCS Summer School 2018
PROGRAM

Simula Metropolitan Center for Digital Engineering, The University of Oslo and
Technical University of Berlin welcome you to the
2018 Summer School on Future Energy Information
Networks (SS-FEIN)

Oslo, Norway 3-7 Sept 2018

GENERAL INFORMATION

Required Equipment:
Laptop computer and power adaptors.

Project Assignment:
All students will be required to submit their project assignment within two weeks from
the end of the summer school, i.e., by Sept. 21, 2018.

Contact person:
Prof. Sabita Maharjan – sabita@simula.no

Speakers are from the following institutes:
*Simula: Simula Metropolitan Center for Digital Engineering, Simula Research Laboratory
and Oslo Metropolitan University, Norway
*UiO: University of Oslo, Norway
*IFI: Institutt for informatikk (Department of Informatics)
*IFE: Institutt for energiteknikk (Institute of Energy Technology)
*ITS: Institutt for teknologisystemer (Department of Technology Systems)
*NTNU: Norwegian University of Science and Technology, Trondheim, Norway
*TUB: Technical University of Berlin, Berlin, Germany
DNV-GL, Norway
SINTEF, Norway
FLIR Systems, Norway
Oslo, Norway 3-7 September, 2018  
Simula Research Laboratory, Oslo

Monday September 3

LUCS SSFEIN 2018 Registration, Formal Opening and Course Introduction (08:15 – 10:00)
08:15 – 09:00: Registration and Coffee
09:00 – 09:15: Welcome speech and formal opening

09:15 – 10:00 Course Overview (Prof. Sabita Maharjan, Simula; Prof. Frank Eliassen, UiO)
- Overall course layout
- Introduction to Future Energy Information Networks

10:00 – 10:15: Coffee break

Morning session (10:15 – 13:00)

L1: Dependability in interdependent systems-of-systems (Prof. Poul Einar Hegaard, NTNU, Norway)
(1 or 2 coffee breaks)
- Network science perspective
- Taxonomy
- Modelling approaches
- Simulation approaches
- Smart Grid perspective
- Communication perspectives
- Use cases

13:00-14:00 - Lunch

Afternoon session (14:00 – 16:00)

L2: Power Modeling and Characterisation for Data Centers (industry Speaker: FLIR Systems, Dr. Kristoffer Robin Stokke)
(15:00-15:15 – Coffee Break)
- Subtopics : Coming Soon!

SOCIAL EVENT

Evening MONDAY, 3rd September (17:00): LUCS SS-FEIN 2018 Opening Dinner
Location: Coming Soon!
Tuesday September 4

Morning session (09:00-12:00)
L3: Electric vehicles and vehicle to grid (V2G) (Prof. Yan Zhang, IFI, UiO) (1 or 2 coffee breaks)
- Definition and main concepts
- Power Management in V2G
- Blockchain for V2G

12:00-13:00 - Lunch

Afternoon session (13:00-17:00)
13:00 - 14:30: L4: Socio-Economic Analysis of Energy Markets (Prof. R. Golombek, UiO)
- Subtopics: Coming Soon!

14:30 – 14:45: Coffee break

14:45 – 17:30: L5: Energy Market and Game Theory for Smart Energy Systems (Prof. Sabita Maharjan, Simula) (1 or 2 coffee breaks)
- Demand Response Management
- Game theory: Definitions and key concepts
- Energy Market: Market dynamics, optimization and equilibrium
- Game theory for optimal market strategies
Wednesday September 5

**Morning session (09:00-12:00)**

L6: Topic: **Security of Supply in a Green Power Market** (Prof. Arne Lind, ITS, UiO)
(1 or 2 coffee breaks)
- Subtopics: Coming Soon!

12:00-13:00 - Lunch

**Afternoon session (13:00-16:00)**

- Opportunities in the energy market
- Who are the Players?
- End-consumers’ (buyers) expectations vs. TSO/DSO’s (sellers) expectations; Willingness to pay
- Flexibility vs. effective prices for shaving power peaks
- Framework necessary for the development of energy markets

14:15 – 14:30: Coffee break

14:30 – 17:30: L8: **Blockchain for Smart Energy Systems** (Prof. Roman Vitenberg, IFI, UiO)
(1 or 2 coffee breaks)
- Concepts and background
- Bitcoin mechanisms in depth
- Advanced blockchain systems (Ethereum and Hyperledger)
- Hands-on tutorial on developing smart contracts in Ethereum
Thursday  September 6

Morning session (09:00-12:00)
L9: Deep learning for future energy systems (Dr. Michael Rieglar, Simula)
(1 or 2 coffee breaks)
- Introduction to deep learning
- Requirements and challenges of data analysis for future energy systems
- Deep learning by example: Smart EV scheduling

12:00-13:00 – Lunch

Afternoon session (13:00-17:00)
13:00 – 16:00: L10: Solar Energy (Prof E. Marstein, IFE)
(1 or 2 coffee breaks)
- Subtopics: Coming Soon!

16:00 - 16:15: Coffee break

16:15 – 17:30: L11: Smart Grid Security from the IoT and Software Engineering perspectives
(Dr. Phu Nyugen, SINTEF)
- Smart Grid Security from the IoT perspective
- Deployment and orchestration approaches for trustworthy smart distributed systems
- Model-Based Security Testing for Advanced Metering Infrastructure.
Friday September 7

**Morning session (09:00-12:00)**
- Demo: A functional microgrid testbed across five villages in Germany (Dr. Thomas Huhn, TU Berlin, Germany)
- MONROE (Measuring Mobile Broadband Networks in Europe) Demo (Dr. Isabel Sanchez, Simula)
- Poster session: Simula/UiO PhD students

12:00-13:00 - Lunch

**Afternoon session (13:00-15:45)**
Work on the Project from L9 (Dr. Rieglar will be available for help)

15:30-15:45: Summer School Wrap Up (Prof. Sabita Maharjan, Simula)

The school will finish at 15:45 on Friday September 7. Please contact us if you will need to leave earlier, and keep in mind the final dinner on Sept 6.

**SOCIAL EVENT**
Evening THURSDAY, September 6, 19:00: LUCS SSFEIN 2018 Closing
Dinner Location: (downtown Oslo)