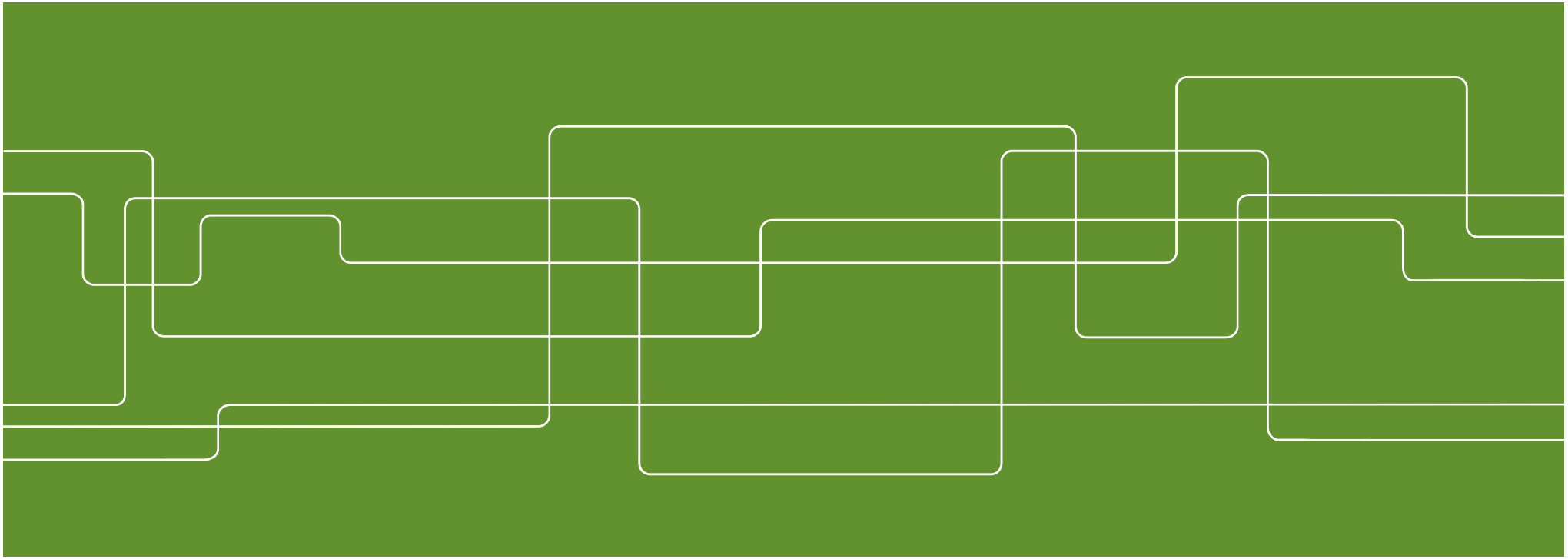
KTH ROYAL INSTITUTE
OF TECHNOLOGY

Power System Protection at KTH



Sweden’s leading university of technology

- KTH is Sweden's oldest and largest university of technology
- More than 13,000 full-time students
- More than 1,700 doctoral students
- Over 3,500 full time employees
- Four campuses in the Stockholm region
- Ranked as the 98th best university in the world by QS

Electrical engineering and computer science

Started 2018-01-01. The subject has roots at KTH dating back to 1901.

A merge between:

- Electrical engineering
- Communication and computer science
- Information- and communication technology

Located at KTH's campus in Kista and at Valhallavägen.

KTH ranked 26th in the world within Electrical & Electronics Engineering (QS) and 54th in the world in Computer Science (THE)

Research areas

Our areas of research:

- Automatic control
- Communication systems
- Computational science and technology
- **Electric power and energy systems**
- **Electromagnetic engineering**
- Electronics
- Fusion plasma physics
- Information science and engineering
- Media technology and interaction design
- Micro and nanosystems
- Network and systems engineering
- Robotics, perception, and learning
- Software and computer system
- Space and plasma physics
- Speech, music and hearing
- Theoretical computer science

Electric Power and Energy Systems

EPE in numbers

- 10 Faculty
- 2 Adjunct Professors
- 6 Affiliated Faculty
- 50 PhD Students
- 10 PostDoc & Researchers
- Approx 80 Master Students
- 2 Lab Tech

The department of Electric Power and Energy Systems' research and education covers **electricity markets** facilitating renewable electricity generation and its integration into the system, **power system dynamics**, **operation and control**, **power electronics** including its application in grids, **electric drives and machines** including applications in electric transportation and resilient **communication and control systems**.

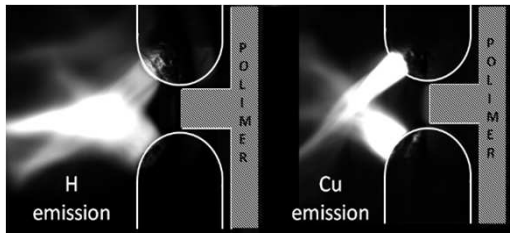
Electromagnetic Engineering (EM)

- Theory, models and methods for design, construction, operation and maintenance of devices intended for generation, distribution and utilization of electrical or electromagnetic energy.
- A unique combination of Electromagnetics, Physics, and Power Engineering.

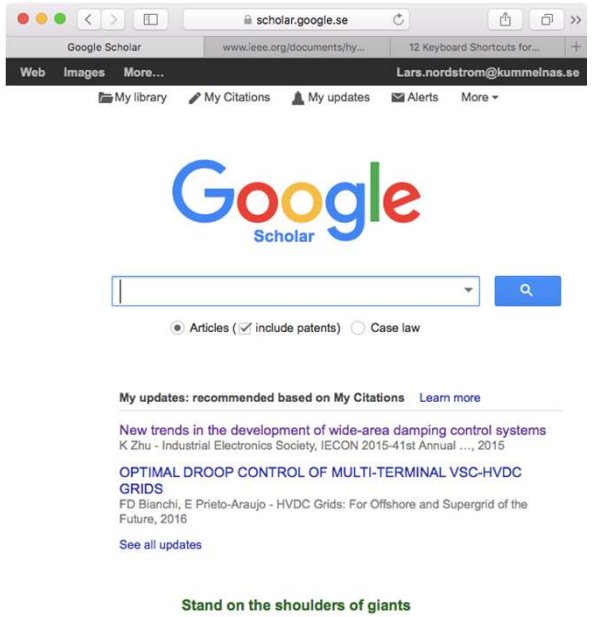
Electric Power		Electromagnetics
Insulation diagnostics		Antennas
High-speed high-current Switching		Inverse Source Problems
Asset Management		Metamaterials
Modelling and characterization of materials and components		Electromagnetic Compatibility, Lightning Protection
Energy Storage		
Power System Protection		

Lab facilities:

1. High Voltage
2. EMC
3. Antenna
4. Magnetic lab
5. Switching lab



Google Scholar Citing rankings by Topic



HVDC	Top 3
Power System Control	Top 3
Wind Power	Top 3
Industrial Electronics	Top 5
Control applications	Top 3
Electrical Machines and Drives	Top 10
Wide Area Monitoring Systems	Top 3

Power groups at EECS School

- **Power markets, system performance and regulation**
  Söder, Hesamzadeh, Amelin,
- **Power system stability and control, Hybrid AC/DC system control and operation**
  Ghandhari, Berggren(ABB), Eriksson (SvK), Mitra (ABB)
- **Communication & Control for Power Systems, Cybersecurity, Distributed control**
  Nordström, Ekstedt, Ericsson (SvK), **Wang**(ABB)
- **Power System reliability, Reliability centered asset management**
  Bertling, Hilber
- **Power Electronics, Multi-level converter technologies, HVDC applications**
  Nee, **Norrga**, Harnefors (ABB) Dijkhuisen (ABB)
- **Electric drives for hybrid applications, permanent magnet drives, electric traction,**
  Wallmark, Leksell, Östlund, Peretti (ABB) Bosga (ABB)
- **Multiphysics modeling, EMC electromagnetic compatibility, lightning**
  Thottapillill, Månsson, Becerra, Norgren
- **Highvoltage, Insulation materials, Electromagnetic modeling,**
  Engdahl, Edin, **Taylor**

Researchers in Protection

Faculty

Lars Nordström – communication & automation
Nathaniel Taylor – Electromagnetics, physics
Staffan Norrga - DC grid protection
Jianping Wang – ABB affiliated faculty

PhD projects

Fabian Hohn
Distributed Signal processing for centralised protection

Tin Rabuzin
SmartProtection in grids with high penetration of renewables – anti-islanding

Ilka Jahn
Protection in HVDC grid applications

Zakaria Habib
Fault-location accuracy in resonant-earthed medium voltage systems