Dept of Telecom Engineering, FEE CTU

Overview: Research and Education

Lukas Kencl
Director, R&D Centre for Mobile Applications (RDC)
Dept of Telecom Engineering, FEE CTU

With Matej Rohlik, Zdenek Becvar, Boris Simak
Prague

- City of 100 spires
- City of technical & scientific tradition!
  - Tycho Brahe
  - Johannes Kepler
  - Nikola Tesla
  - Albert Einstein
    - All practised here
- Famous inventors
  - Christian Doppler (CTU Alumnus!)
    - Doppler effect
  - Otto Wichterle
    - Contact lenses
- Neighboring Charles University oldest in CE
  - Established 1348
Czech Technical University in Prague (CTU)

- Among oldest technical universities in Central Europe
  - Established 1707
  - Edict of Joseph I, Holy Roman Emperor
- 8 Faculties
  - Electrical Engineering (since 1950); abbrev. FEE
  - Architecture
  - Biomedical Engineering
  - Civil Engineering
  - Information Technology
  - Mechanical Engineering
  - Nuclear Sciences and Physical Engineering
  - Transportation Sciences
- ~23 000 students
  - 2nd largest in CR
- ranking:
  - Top 420 Worldwide,
  - Top 120 TU
- www.cvut.cz
Faculty of Electrical Engineering (FEE)

Ca 5000 students (2nd largest within CTU)
- Bachelor, Master, PhD

2 Campuses in Prague

17 Departments:
- Telecommunications Engineering
- Circuit Theory
- Computer Graphics and Interaction
- Computers
- Control Engineering
- Cybernetics
- Economics, Management and Humanities
- Electric Drives and Traction
- Electroenergetics
- Electromagnetic Field
- Electrotechnology
- Languages
- Mathematics
- Measurements
- Microelectronics
- Physics
- Radioelectronics


Research oriented
- By far strongest at CTU

Tight industrial collaboration
- IBM
- Honeywell
- Microsoft
- Cisco Systems
- Electrolux
- Samsung
- Google
- Vodafone
- T-Mobile
- O2
- Toshiba

Dept of Telecom, FEE CTU Prague

4.3.2015
Department of Telecommunications Engineering

- **Head:** prof. Boris Simak
- **Staff**
  - 3 full professors
  - 8 associate professors
  - ~20 researchers, research fellows
  - ~30 PhD students

- **Research Areas**
  - **Mobile and Wireless Communications**
  - Next Generation Networks - NGN
  - **Internet of Things and Identification (RFID)**
  - **CyberSecurity**
  - Cloud Computing and Networking
  - SmartGrid
  - **Transmission Media and Systems**
  - **Digital Signal Processing**
  - Assistive Technologies and eHealth
  - **ICT Systems Management**

- **Industrial partners:**
  - Vodafone,
  - T-Mobile,
  - O2,
  - Cisco,
  - **Electrolux,**
  - Juniper Networks,
  - Huawei,
  - Alvarion,
  - Sitronics,
  - Microsoft Research,
  - IBM Research

- **comtel.fel.cvut.cz/en**
- Dept of Telecom, FEE CTU Prague
- 4.3.2015
- New! ITU CoE for CyberSecurity - 2014
LVR: Development and Implementation Labs

- Rapid prototyping labs
  - manufacturing of mechanical parts
  - 3D printing
  - flying probe ICT testers
  - testers with flying probes for rapid electrical measurement
  - testing of assembled printed circuit boards
  - etc
R&D Centre for Mobile Applications (RDC)

- Department of telecommunications engineering research center focused on industrial cooperation

- Mission: **internationally competitive** research of **high value to industrial partners**

- Major long-term industrial research partners

- Research: Applications, interfaces and infrastructure for the mobile cloud
  - Cloud networking
  - Privacy and security
  - Internet of Things
  - Energy-efficient networks
  - LBS and mobility modeling
  - Assistive technologies
  - Voice and 3D mobile interaction
  - Brain-computer interface

- ~5-15 Students on Industrial Scholarship

- Frequent industry tech transfer, conference & journal excellence

- Wide international collaboration
  - EPFL Lausanne, TU Dresden, ISEP Paris, UPC Barcelona, ...
  - NIT Rourkela, India
  - Electrolux GTC, MSR Cambridge+Redmond, IBM Research - Zurich, Cisco San Jose, ...
  - Internships, joint projects, PhD programs
ITU CoE for CyberSecurity (since 2014)
ITU CoE Selection Procedure

• Time schedule:
  – Call for proposals: 2. 6. 2014
  – ITU meeting: 17. 10. 2014
  – Results published: 30. 10. 2014
  – Official start: 1. 1. 2015

• Maximum of 6 CoEs per region (6 regions)

• Total number of registered applications: 99

• Number of selected: 32

• CTU among them! 😊
## CoEs Across the Globe 1/2

<table>
<thead>
<tr>
<th>Institution</th>
<th>State</th>
<th>Priority Area(s)</th>
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<tbody>
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<td><strong>Africa Region</strong></td>
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<td>DBI</td>
<td>Nigeria</td>
<td>Policy and Regulation</td>
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<td>E.S.M.T.</td>
<td>Senegal</td>
<td>Broadband Access, Digital Broadcasting</td>
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<td>ESATIC</td>
<td>Côte d’Ivoire</td>
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<td>Rwanda</td>
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<td>South Africa</td>
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<tr>
<td>AFRALTI</td>
<td>Kenya</td>
<td>Spectrum Management, Broadband Access</td>
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<td><strong>Americas Region</strong></td>
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<tr>
<td>INICTEL UNI</td>
<td>Peru</td>
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<td>ICT and Climate Change Mitigation and Adaptation</td>
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(Cyber) Security

- **Networks**
  - VPN
  - Intelligent
  - Sensor

- **Communication**
  - Signalling
  - Data traffic
  - Filtering
  - BYOD

- **Threats (APT)**
  - Malware
  - Botnets

- **Cryptography**
  - Ciphers
  - Hash functions

- **Cybersecurity**
  - Laws and processes
  - Recommendations
  - Regulatory

- **Management**
  - Vulnerabilities
  - InfoSec
  - SIEM

- **Protection**
  - Data
  - Infrastructure
  - Monitoring

- **Security**
  - System
  - Physical
  - Operating systems

Dept of Telecom, FEE CTU Prague

4.3.2015
Training

- **Telecommunications**
  - From GSM to LTE, Femtocells, Smallcells, WiFi, VoIP
  - Ethernet/IP-based, sensor and intelligent networks

- **Security**
  - Deep packet inspection
  - Data communication inspection and mining
  - Applied cryptography, AutoID (RFID, NFC)
  - Cloud security and privacy
  - Virtualized and separated infrastructure

- **Academies** (more than 10 years of experience)
  - Cisco, Juniper, Huawei, Checkpoint

- **Cedupoint**
  - Technical courses
  - Professional training environment
Thank you! Q&A?

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