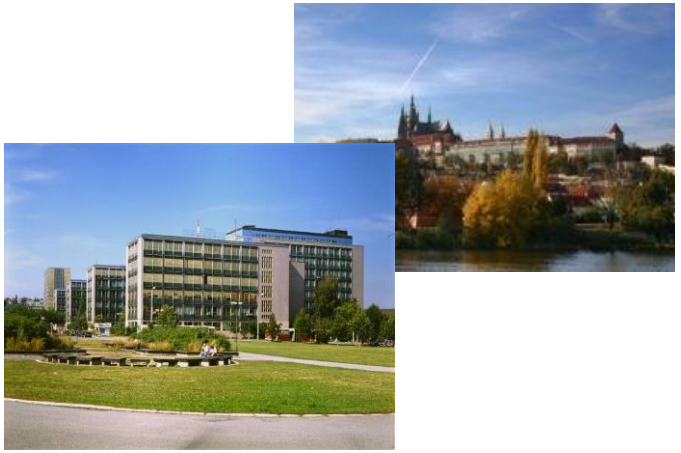


Dept of Telecom Engineering, FEE CTU

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

Czech Technical University in Prague
Faculty of Electrical Engineering

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

Czech Technical University in Prague

Faculty of Electrical Engineering

- **~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

http://fel.cvut.cz/en/

Research oriented

- By far strongest at CTU

Tight industrial collaboration

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

Czech Technical University in Prague
Faculty of Electrical Engineering

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**

New! ITU CoE for CyberSecurity - 2014

Czech Technical University in Prague
Faculty of Electrical Engineering

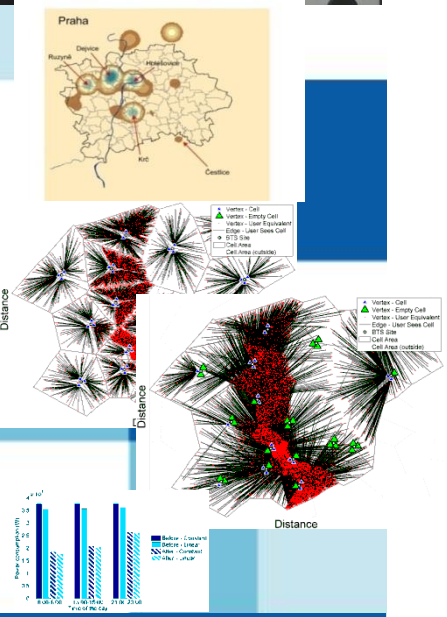
LVR: Development and Implementation Labs

- 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

Electrolux · cisco Research · IBM · Microsoft Research · vodafone



- 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

Czech Technical University in Prague
Faculty of Electrical Engineering

ITU CoE for CyberSecurity (since 2014)

Cybersecurity

ITU CoE Selection Procedure

- Time schedule:
  - Call for proposals: 2. 6. 2014
  - Deadline: 29. 8. 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

	Institution	State	Priority Area(s)
Africa Region	DBI	Nigeria	Policy and Regulation
	E.S.M.T.	Senegal	Broadband Access Digital Broadcasting
	ESATIC	Côte d'Ivoire	**Cybersecurity**
	URCST	Rwanda	**Cybersecurity**
	Telkom SA	South Africa	ICT Applications and Services
	AFRALTI	Kenya	Spectrum Management Broadband Access
Americas Region	INICTEL UNI	Peru	Broadband Access
	UNLP	Argentina	**Cybersecurity**
	CINTEL	Colombia	Spectrum Management
	INATEL	Brazil	Digital Broadcasting
	CCAT LAT	Argentina	ICT Applications and Services
	CITIC	Ecuador	ICT and Climate Change Mitigation and Adaptation
Arab Region	INPT	Morocco	Policy and Regulation
	CIFODE'COM	Tunisia	Broadband Access
	CERT	Tunisia	Conformance and Interoperability
	NTI	Egypt	Spectrum Management
	SUDACAD	Sudan	ICT Applications and Services
	TRA	Bahrain	Capacity Building in Internet Governance

CoEs Across the Globe 2/2

	Institution	State	Priority Area(s)
Asia-Pacific Region	MICT	Thailand	Policy and Regulation Broadband Access
	NIA	Republic of Korea	Policy and Regulation
	ALTTC	India	Broadband Access
	IMPACT	Malaysia	**Cybersecurity**
	MIIT	China	Conformance and Interoperability
	SRMC	China	Spectrum Management
CIS Region	ONAT	Ukraine	Policy and Regulation Digital Broadcasting
	KSTU	Kyrgyz Republic	Broadband Access e-Waste
	MTUCI	Russian Federation	**Cybersecurity** ICT Applications and Services
Europe Region	**CTU**	**Czech Republic**	**Cybersecurity**
	FEEIT	The Former Yugoslav Republic of Macedonia	Broadband Access
	NIT	Poland	Capacity Building in Internet Governance
	TUC	Germany	**Cybersecurity** Broadband Access
	ISQ	Portugal	e-Waste Conformance and Interoperability

(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

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

cedupoint™
Continuing Education Point

Thank you! Q&A?

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