



universität  
wien

Chair of Future Communication  
Faculty of Computer Science  
Prof. Dr. K. Tutschku

# System Architectures for Future Networks

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**Before we continue, please choose a language / Bevor's losgeht, wählen Sie bitte eine Sprache aus**

(1) I don't speak German at all.

(2) I'm fine with either language.

(3) Ich verstehe die beiden oberen Sätze nicht.

## Who we are

- Albert RAFETSEDER,  
BSc MSc
  - Researcher at Univie



- Dr. Ivan GOJMERAC
  - Senior Researcher at FTW



## What is this?

- VU System Architectures for Future Networks
  - KFK *Networked Systems*
  - Media Informatics Master's Track, 1st semester
  - Course evaluation at end of semester (but *start taking notes now!*)
- 6 ECTS means lots of work. Really.
  - 6 ECTS \* 25 hours per semester / 12 weeks in this semester
  - That's > **12 h per week** on average

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## What does "VU" mean?

- Compulsory attendance
  - if not, medical certificate
  - if not, score is reduced
- Permanent evaluation of students
  - Mid-term and final exams
  - Student talks on current papers
  - Lab assignments, practical programming tasks
  - Small exams without previous notice
  - Participation in discussions during and after the lectures
    - CEWebS forum
  - Designated scribes (see next slide!)

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## Designated Scribes

- Two people per lecture volunteer to take notes
- Use LaTeX template, prepare one script together
- I don't need to remind you of
  - Correct citation
  - Due diligence
  - Scientific standards
- Ask around (fellow students, lecturers) if anything is unclear
- Post an alpha release on SVN
- *Everybody* discuss and improve!
- Stable release after one week of improvements
  
- Voilà!
  
- (Oh wait, it will be graded, too).

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## What to expect

- Cartography, structure, fundamentals; hands-on
  - How do existing networks work?
  - Which paradigms and algorithms are there?
  - Measure, evaluate, know more
- Current academic efforts on network design
  - See big conferences/journals: SIGCOMM, CoNEXT, EuroSys, IMC, PAM, PerCom, MobiSys, VTC, ...
- Practical perspectives from ISPs, operators, public participation projects, system integrators
  - Hopefully, we will have excursions/workshops
  - ISPA, ZID, A1 Telekom Austria AG, Kapsch, Alcatel, Funkfeuer, ...

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## Suggested Topics

- See next slide for a non-exhaustive list of suggestions
- You choose topics (or suggest your own), but you must argue for them!
  - This is why we meet tomorrow
- Topics beget dates/times/locations of meetings



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## Suggested Topics

- The end-to-end principle
- Network topologies
- Clos nws, flat-neighborhood
- Stochastic performance evaluation, Erlang formula
- Scheduling
- Software-defined radios/nw
- Privacy by design: TOR, I2P, OTR, “mental games”
- Deep packet inspection
- Hacker ethics
- Bit pipes vs portals; ARPU
- QoS: DiffServ, best effort
- CDNs
- Security vs the TCP/IP stack
- MPLS, BGP, Dijkstra, (AO)DV
- 3G/4G theory + experiments
- Social/scale-free networks
- IPv6
- RONJA, Funkfeuer
- Seattle + Sensors
- Communication-avoiding algorithms
- SCADA, M2M
- Network neutrality in Iran, Syria, China, EU, USA
- TEMPEST
- How do I become an ISP?
- Information-centric NWs
- Security in CPEs, operators, ...



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## Lecture Appointments – TBD

- Case 1: Keep as planned
  - Tue 08:00-09:30 and Wed 08:00-09:30 per decree
  - Approximately 30 appointments in the semester for lectures, lab assignments, presentations, ...
- Case 2: Hope for the best
  - We are currently looking for an alternative three-hour timeslot
  - Apart from this, go with cases 1 or 3
- Case 3: Include excursions
  - Will consume more time
  - 3-6 hours blocks
- What do you suggest? (No foul language, please).

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**That's it for today!**

**See you tomorrow at 08:00.**