

# FG INET: Intelligent Networks

An-Institut Deutsche Telekom Laboratories

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<http://www.net.t-labs.tu-berlin.de/>

# INET: Research Group

## ❑ Location

- Telefunkenhochhaus, 16. Stock

## ❑ Office hours

- Tuesday 12:30 – 13:00
- After the lecture or per e-mail

## ❑ Contact

- Best per e-mail 😊

## ❑ Teaching contact

- Fabian Schneider

## ❑ Web site

- <http://www.net.t-labs.tu-berlin.de/>

# T-Labs

- ❑ Institute at TU Berlin funded by Deutsche Telekom AG
- ❑ Co-locates researchers from TU Berlin and project managers of Deutsche Telekom
- ❑ Two parts
  - Strategic research
    - 4 Research Groups + 30 Researchers + 40 Ph.D. students so far: INET, Quality and Usability (QU Lab)
  - Innovation development
    - Project work, e.g., IP-TV, Overarching AAA

# Research interests

- ❑ Internet in general
- ❑ Clean slate network architectures
- ❑ Traffic measurement and characterization
- ❑ Wireless mesh networks
- ❑ Peer to peer and social networks
- ❑ Network security, e.g., intrusion detection

# Sonja Buchegger, Ph.D.



## □ Biography:

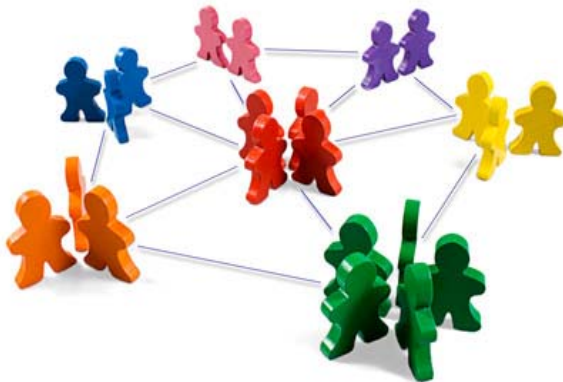
- Computer Science @ Uni Klagenfurt, Austria  
Uni Alicante, Spain / ETH Zurich, Switzerland (exchange student)
- Networking @ IBM Research Zurich Lab (Researcher)
- Communication Systems @ EPFL, Swiss Federal Institute of Technology in Lausanne (Dr.)
- Information Systems @ UC Berkeley (Postdoc)
- Networking @ Deutsche Telekom Laboratories  
(Senior Research Scientist)

## □ Research Interests:

- Self-organized networks  
(peer-to-peer, mobile, sensor, vehicular, ..)
- Economics and security

# Peer-to-Peer social networks

- Facebook, StudiVZ, MySpace, etc. collect data about everyone, can even sell data to others. What if you don't want that?
- How can we have the cool features of online social networks, but with privacy?
  - Decentralization: peer-to-peer infrastructure
  - Protection: encryption and access control



# Yannis Avramopoulos, Ph.D.

## □ Biography:

- ECE @ Technical University of Athens, Greece
- Electrical engineering @ Princeton University (Ph.D. advisor Prof Hisashi Kobayashi)
- Computer Science @ Princeton University (Postdoc in Jennifer Rexford's group)
- Networking @ Deutsche Telekom Laboratories (Senior Research Scientist)

## □ Research Interests:

- Secure routing
- Secure measurements
- Optimization of virtual networks

# Security aspects of Internet communication

- ❑ Internet security architectures
- ❑ Secure traffic engineering
- ❑ Network neutrality
- ❑ Deployability of security architectures / protocols



# Example of a research topic: Evaluating the benefits of re-routing

## □ Scenarios

- P2P systems
- Community networks
- Traffic engineering via traffic redistribution
- Wide area migration of virtual machines
- ...

# Example: Peer-to-Peer networks

❑ Can ISPs and P2P users cooperate?

❑ Goal:

- Improved performance for users
- Enable traffic control for ISP

❑ Idea:

- ISPs: offer oracle that provides network distance info
- P2P: use oracle to build P2P neighborhoods

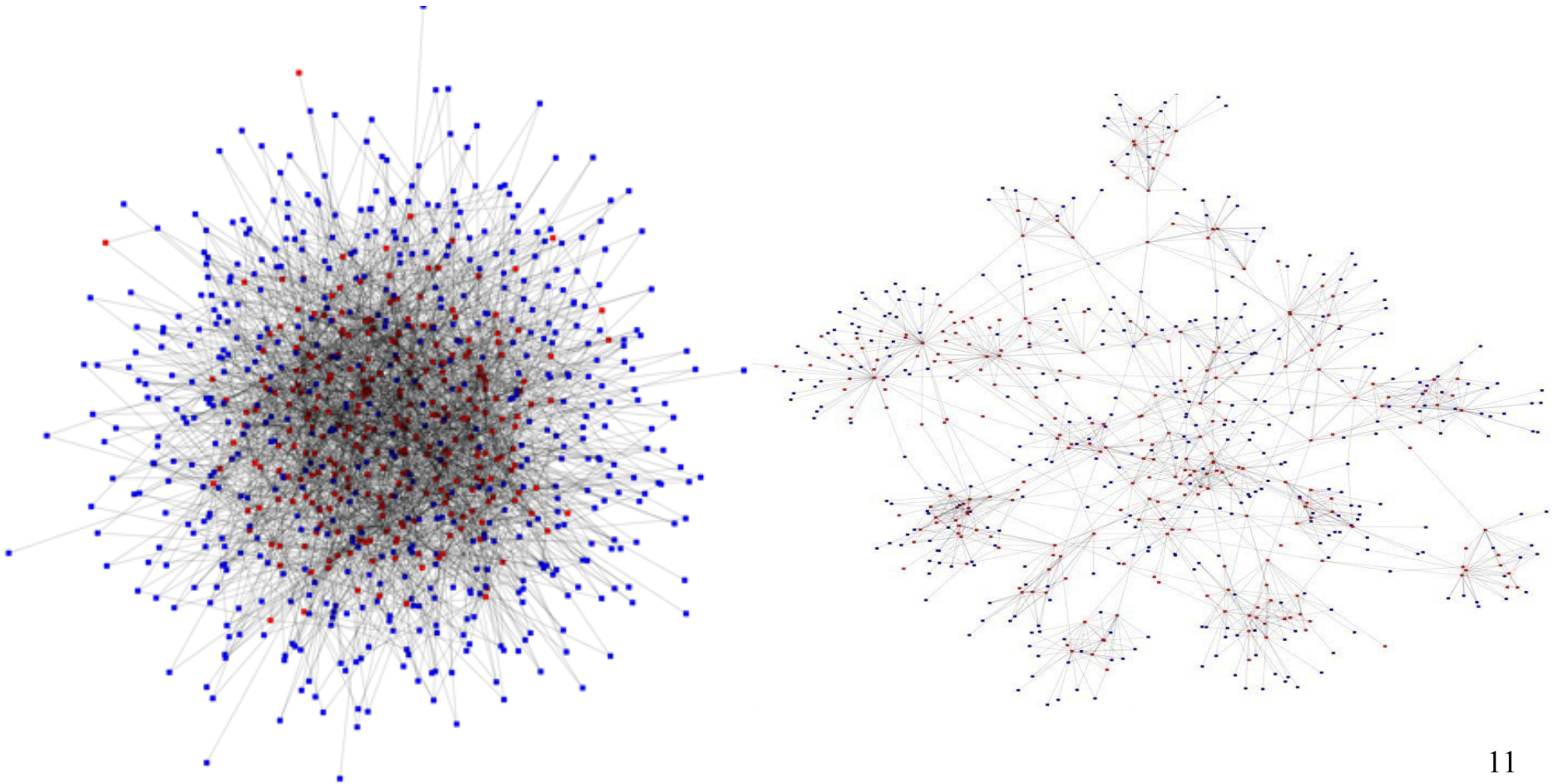
❑ P2P oracle concept:

- Service of AS / ISP
- Input: list of possible dst IP addr. and src IP addr
- Output: ranked list of dst IP addr.  
e.g. according to distances between src IP and dst IPs

# Benefits of P2P oracle for topology

□ without oracle

□ with oracle



# Teaching

- ❑ Lectures (Vorlesungen)
- ❑ Seminars (Seminare)
- ❑ Lab course (Praktika)
- ❑ Projects (Projekte)
- ❑ Theses (Diplom/Master/Bachelor)
  
- ❑ PGT: Project Group Meeting

# Lectures

- ❑ Network protocols and architectures (VL+UE)
  - How does the Internet work ....
  - Base for all other INET classes
  
- ❑ Internet Routing (VL)
- ❑ Internet Security (VL)
- ❑ Internet Measurement (VL)

# Seminars

- Network architectures
  - Emphasising:
    - Internet routing
    - Internet security
    - **Internet measurement**
  - Topic: current research paper
  - Task:
    - Summary paper + presentation
    - Participation in discussion during the seminar
  - Typically en block after the end of term

# Lab courses

- ❑ Hands on exercises
  
- ❑ **Protocol Design**
  - Implementing network protocols (not applications)
  
- ❑ Router Lab
  - Configuring and managing networks
  - Internet experiments in a Lab

# Projects and Theses

## □ Topic:

- See Web pages
- Talk to members of INET
- Suggest your own topic

## □ Work flow:

- Literature/background search
- Presentation of idea at project group meeting (PGT) (20 minutes 😊)
- Execution of idea / preparation of thesis document
- Presentation of results at PGT (20 minutes)