

# Multimedia Streaming in Dynamic Peer-to-Peer Systems and Mobile Wireless Networks

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# Outline of the Seminar

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- **Two Parts**
  - **Peer-to-Peer (P2P) Systems**
  - **Mobile Multimedia Streaming**
- **Both are quite popular in research and industry**
- **Currently serving millions of users with expected very high growth rates (specially mobile)**
- **... and yet both make challenging environments for providing high quality**

# Outline: Goals of this seminar

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- Understand challenges and opportunities of multimedia services in P2P and mobile networks
- Describe key research problems in these environments and analyze their current solutions
- Identify open research questions and potential approaches to solving them

# Outline: General Approach

- **Brief Introduction to each area**
  - Cover basic concepts
  - Define key terminologies
  - ... sufficient for non-specialist in the area to understand it
- **Identify main research problems**
  - List of problems
  - High-level description of different solutions
- **Focus on subset of the problems, and for each**
  - Present details, including:
    - Formulation of the problem
    - Algorithmic solution and performance analysis
    - Evaluation in simulation, and
    - Actual implementation in real systems and/or testbeds

# Part I: P2P Systems

## ■ Introduction to P2P Systems

- P2P computing model
- Various P2P applications
- General system model for P2P systems
- P2P computing: what is (and is not) new
- Main research problems

## ■ Focus Research Problems

- P2P Traffic modeling and caching
- Resource management in P2P streaming
- Efficient multi-sender data transmission in P2P streaming
- Scalable video coding and network coding in P2P streaming
- Design of peer-assisted Content Distribution Networks

# Part II: Mobile Multimedia Streaming

- **Introduction to Mobile Multimedia Systems**
  - Classification of mobile multimedia services
  - Current and emerging wireless networks for mobile multimedia services
  - Main research problems
- **Focus Research Problems**
  - Minimizing energy consumption for mobile devices
  - Maximizing bandwidth utilization of wireless spectrum
  - Supporting heterogeneous mobile devices
  - Cooperative wireless multimedia streaming
  - Design of a mobile video streaming testbed