Outline

• Introduction of Instructor and TA
• Structure of Course – Syllabus
• Course Evaluation
• Tools (piazza, compass2g, web)
• Online Students Communication
• Course Sources
• Next Steps
Instructor

• Klara Nahrstedt
• PhD 1995 University of Pennsylvania
• Contact: Klara@Illinois.edu
• Research:
  • **Multimedia networking** - QoS routing, QoS management, resource management, multicast, pricing, …
  • **Multimedia distributed systems** - overlay multicast, peer-to-peer systems, service composition, resource management, …
  • **Mobile computing** – smart phones protocols – P2P, video streaming over mobile phones, group management, mobility management, context prediction, security and privacy, …
  • **Multimedia operating systems** (soft-real-time scheduling, caching)
  • **Multimedia applications** (multi-view 3D tele-immersive collaborative environments, mobile multimedia, P2P, IPTV)
Teaching Assistant

• Wenyu Ren
• 3rd Year PhD Student
• Email: wren3@Illinois.edu
• Skype: miao-rwy

Research
• Smart Grid Networks
• Real-Time Inspection of Networks
• Network Measurements and Analysis
Course Logistics

• Class Time: Tuesday and Thursday 3:30 – 4:45pm

• Class Place: 0216 Siebel Center and/or Online

• Office Hours:
  • Instructor: Tuesday and Thursday 2:00 - 3:00pm
  • TA: Wednesday 3:00-5:00pm
  • For online students office hours will be skype sessions by appointment or during office hours

• Class Website: https://courses.engr.illinois.edu/cs538/

• Contact:
  • Instructor: klara@Illinois.edu
  • TA: wren3@Illinois.edu
Course Structure (1)

• Speed-Dating for Research Projects (Individual Effort)
  • Get to know each other – research, interest and expertise

• Class Presentations (Lectures) and scribing of discussions (Individual Effort – set of students will present and scribe each presentation session)
  • Done by instructor and students (see later information)

• Paper Reading and Reviews (Individual Effort)
  • We will read papers that are already posted on the website https://courses.engr.illinois.edu/cs538/
  • Each lecture suggests two papers for particular topic.
  • Each lecture presentation will be based on the first paper, but the presenter can also include a second paper in his/her lecture presentation to support the topic/argument.
    • The second paper is therefore highly recommended.
  • Each student will prepare reviews of two papers from two different sessions (others than presented) during the semester.
    • The review can be either of the 1st or 2nd paper of each session.
Course Structure (2)

• Take-Home Mid-Term Exam (Individual Effort)
  • There will be take-home exam based on reading of papers.

• Assignments (Individual Effort)
  • There will be two experimental assignments
    • Experimentation with RIB
    • Experimentation with OpenFlow

• Final Project (Group Effort)
  • Project Proposal
  • Project Midterm Presentation
  • Final Paper and Poster Presentation
Speed-Dating for Research Projects

• Each student prepares 1-2 slides to introduce him/herself to the class

• January 21 in class presentations
  • Online students also send the slides to TA and either the TA presents the slides if online students cannot skype into the class on January 21, or online students present in live session or send a short video (please, work with TA)

• Each student sends slides to TA by January 20, 11:59pm

• Introduction slides should have
  • Name, email address, year(s) in the PhD/MS program (e.g., 2nd year PhD student)
  • Research Description for PhD/MS students who already done some research (e.g., Security in SDN) or Research Activity Description for 1st year PhD/MS students of their last semester project, related to networks/systems/security (e.g., cloud computing project in CS425)
  • Research Interests in Networks – what area of networks are you interested in (e.g., routing, cloud centers, video streaming, network security, network measurements, application networks such as smart grid network, health network, …)
  • Expertise – what do you bring to the table (e.g., programming in RCP/IP, C, C++, Javascript, Phyton, Webtools, Linux, Android Programming, …)
Lectures

• Each student **picks two lecture sessions** during the semester to present the paper and topic in an interactive fashion
  • Each session can be selected by at most two students (please, select **two lecture sessions**, and then **four additional lecture sessions**) – TA will assign students to lecture sessions on a FCFS basis
  • Each student will lead 1-2 lecture sessions depending on the total number of student of this course

• If a session has two students
  • 1 student presents the lecture
  • The other will serve as scribes of the lecture
  • Scribes prepare a 1 page summary of the discussion during the lecture
  • Scribe(s) post summary on piazza latest one week after the class discussion

• The student presentations start from **February 4**
  • Start from the Lecture on Forwarding Architecture
  • Send your **two lecture choices** (and **4 additional lecture choices** for balancing) to TA by **January 28, 2016** together with your review choices; we will then assign the lectures to students in FCFS approach.

• Lecture presentation should be sent to instructor & TA by **11:59pm on the day prior to the lecture given**.
  • We will post the slides on the website.
Reviews

• **Two reviews** per student per semester
  • Email to TA which papers you want to review by **January 28, 2016**
  • Provide more (4 papers) than two papers as your choices since the TA will aim to balance the reviews so that each lecture and each paper have balanced number of reviews.
    • Policy of allocation will be First Come, First Go
  • **Pick any of the papers starting with papers on February 4, 2016**

• Based on EDAS review guidelines
  • Short summary of the paper
  • Positive aspects about the paper (at least 4-5 positive aspects why you would accept the paper)
  • Negative aspects of the paper (at least 4-5 reasons why would you reject or request to revise the paper)

• One paragraph comment presenting
  • Advantage of paper’s design that was not discussed in the paper
  • Suggestion of a way to extend or build on the paper in future work

• **Reviews are due 11:59pm the night before the lecture** for which the paper was assigned
  • Post reviews on piazza for further discussion
Research Projects (1)

• Form groups
  • Projects can be conducted alone or in a group of 2-3 people
  • Let TA know your groups formation for grading purposes by Thursday, January 28
  • You should form groups within the first week of classes (use the second lecture of participants’ introduction and piazza for introduction and search of group members)

• Look for research ideas
  • You can consider continuation of your own research if it fits in the course topics
  • You may come up with your own ideas
  • You should read papers from high quality conferences and propose extensions or get new ideas to go in different directions
  • You can come and talk to the instructor for further project ideas
Research Projects (2)

• Prepare project proposal
  • At most 1 page describing
    • Problem description
    • Steps you plan to take to address the problem
    • Close Related work (at least 3 full academic papers citations) and why your proposed problem is different than those or why your proposed solution is better.
  • **Deadline for proposal: 11:59pm Tuesday, February 16, 2016**

• Prepare 5 minutes project midterm presentation
  • Describe the problem
  • Describe your solution
  • Describe your progress (you should have substantial design and implementation in place)
  • **Deadline for midterm presentation: Thursday, March 31 and Tuesday, April 5, 2016**
    • There will be a sign-up sheet for groups to sign up for presentations on these two days
Research Projects (3)

• Prepare final report
  • Use ACM Format
    • 6 pages for single person project
    • 8 pages for two people project
    • 12 pages for three people project
  • Deadline for final report: 11:59pm, Wednesday, May 4
  • Report Submission via email to instructor

• Prepare poster
  • 6-9 slides with
    • problem motivation,
    • problem description,
    • problem solution (2-3 slides)
    • experimental results
    • conclusion and lessons learned

• Present poster
  • Deadline: Poster presentation TBD (To Be Determined)
Assignments

• There will be two assignments

• Assignment 1 on RIB analysis
  • Posted on Thursday, January 28
  • Deadline on Tuesday, February 9

• Assignment 2 on OpenFlow
  • Posted on Tuesday, March 8
  • Deadline on Thursday, March 17
Take-Home Midterm Exam

• Posted on Monday, February 29
• Deadline on Wednesday, March 2
• Questions will come from papers covered between January 26 to February 25 (only the first paper in each lecture).
Course Topics (see papers on website)

- IP History
- IP Architecture
  - General Architectural Principles
  - Forwarding IP Architecture
- Routing
  - Inter-domain routing – BGP routing
  - QoS routing
  - Routing reliability
  - Secure routing
- Congestion Control
- Software-defined Networks
  - Architecture
  - Applications
- Data Centers
  - Network architecture
  - Congestion control
  - Cloud services
- Internet Measurements
- Multimedia Networks
  - Content Distribution
- Security
- Health Networks
Course Evaluation

• Project – 40% (Group Effort)
• Two Paper Reviews – 10% (Individual Effort)
• Paper presentation (or scribe) – 10% (Individual Effort)
• Midterm Exam – 20% (Individual Effort)
• Assignment 1 – 10% (Individual Effort)
• Assignment 2 – 10% (Individual Effort)
Grading

• 93: A
• 90: A-
• 87: B+
• 83: B
• 80: B-
  • 77: C+
  • 73: C
  • 70: C-
  • 67: D+
  • 63: D
  • 60: D-
  • 0: F

• This is the “worst-case” cutoff
• It might be lowered based on class performance, but it won’t be raised
Tools

• Compass 2g - https://compass.illinois.edu/webct/entryPageIns.dowebct
  • We will use the grade book of compass 2g, i.e., all grades will be uploaded there
  • Potentially, we will also use it for uploading your work (e.g., MPs)

• Piazza – https://piazza.com/illinois/spring2016/cs538/home
  • We will use the discussion board, announcements and sharing reviews, comments, and coordination for presentations and reviews assignments

• Web site - https://courses.engr.illinois.edu/cs538/
  • We will use this website for general course information and distribution of slides for each lecture
Online Students Communication

• We will use skype for communication with online students.
• During TA office hours, skype will be available to ask questions by default
• During instructor office hours, send request to instructor for skype session
• Outside of office hours, email for separate skype session to instructor and TA
• Lectures will be recorded and made available under “Lecture Video” accessible from class website
• TA will have skype session open during lectures, hence online student can listen and ask questions
Course Sources (1)

• Publication Venues
  • Core networking conferences and journals
    • SIGCOMM, NSDI, HotNets, IMC, CoNEXT, CCR, INFOCOM, ACM/IEEE ToN
  • Wireless
    • MobiCom, MobiSys, HotMobile, SenSys, IPSN, Percom
  • System and Networking
    • SOSP, OSDI, USENIX ATC, HotOS, ICDCS
  • Security and Networking
    • CCS, USENIX Security, NDSS, IEEE Symposium on Security and Privacy
  • Theory and Networking
    • SIGMETRICS, PODC, SPAA, MobiHoc
  • Multimedia Systems and Networking
    • MMSys, NOSSDAV, ACM Multimedia, ACM TOMCCAP, Springer Multimedia Systems Journal, IEEE TMM
Course Sources (2)

• Experimental Resources
  • Testbeds
    • Planetlab
    • GENI
    • Emulab
    • Others
  • Emulators and Simulators
    • Ns-2
    • Ns-3
    • Mininet
    • ModelNet
    • C-BGP

• Measurement Data
  • CAIDA (Center for Applied Internet Data Analysis)
  • Route Views (from Oregon) – real-time BGP data collection
  • SNAP (Stanford Network Analysis Project) – mining of network graphs – social networks, web graphs, road networks, ....
  • FCC data
  • FCC maps
  • Others
Next Steps

• Form Groups for project
  • Use piazza to find group members
• Inform TA by January 28 about your groups formation
• Look through papers on class website
• Login to compass 2g to ensure you have access
• Go through all material on class website
• Select papers to review and lectures to present and inform TA through email by January 28 (FCFS)
• Speed-Dating Lecture: Prepare 1-2 slides for January 21 lecture to introduce yourself
For 2\textsuperscript{nd} and 3\textsuperscript{rd} year students

Welcome Back.

For 1\textsuperscript{st} year students

exciting
fun
overwhelming

anxious
happy

confusing
fantastic

scary

nervous