NSF Workshop on Future Directions in Smart Networking and Communication

Workshop Co-Chairs
Hongyi Wu, Old Dominion University
Kaushik Chowdhury, Northeastern University

WiFi Password: Atlanta17

Overarching Goal

- Chart a broad vision for the future of smart networking and communication
  - What is smart networking and communication?
  - What are the killer applications?
  - Identify new enabling technologies to achieve smart networking
  - Identify new fundamental challenges and research problems
  - Identify our role in the interdisciplinary efforts for achieving smart communities, smart city, smart home, smart health, smart …
  - Discuss opportunities for education, industrial-academic collaboration, and international collaborative research
  - Recommendation to NSF
    - Focus areas of research in smart networking and communication
    - Prioritized investment

Workshop Thrusts

Topic 1. Smart network architectures and applications

Topic 2. Smart network analysis, protocols, and optimization

PANEL A = Topic 1 + Topic 2

Topic 3. Security & privacy

Topic 4. City-scale smart network testbed platforms

PANEL B = Topic 3 + Topic 4

Agenda

- 8:00 am – 8:15 am, Opening Remarks, Wenjing Lou, NSF

- 8:15am – 8:30 am, Workshop Overview by Workshop Co-chairs, Hongyi Wu and Kaushik Chowdhury

- 8:30 am – 9:30 am, Panel A: Discussion on Workshop Topics 1 and 2

- 9:30 am – 9:45am, Coffee break

- 9:45 am – 11:15am, Breakout discussion (Session 1 for Topics 1 and 2)

- 11:15 am – 11:45pm, Breakout groups reconvene

- 11:45 am – 12:45 pm, Lunch

Agenda

- 12:45 pm – 1:45 pm, Panel B: Discussion on Workshop Topics 3 and 4

- 1:45 pm – 2:00 pm, Coffee break

- 2:00 pm – 3:30pm, Breakout discussion (Session 2 for Topics 3 and 4)

- 3:30 pm – 4:00 pm, Breakout groups reconvene

- 4 pm: Adjourn

Lunch and Coffee Break
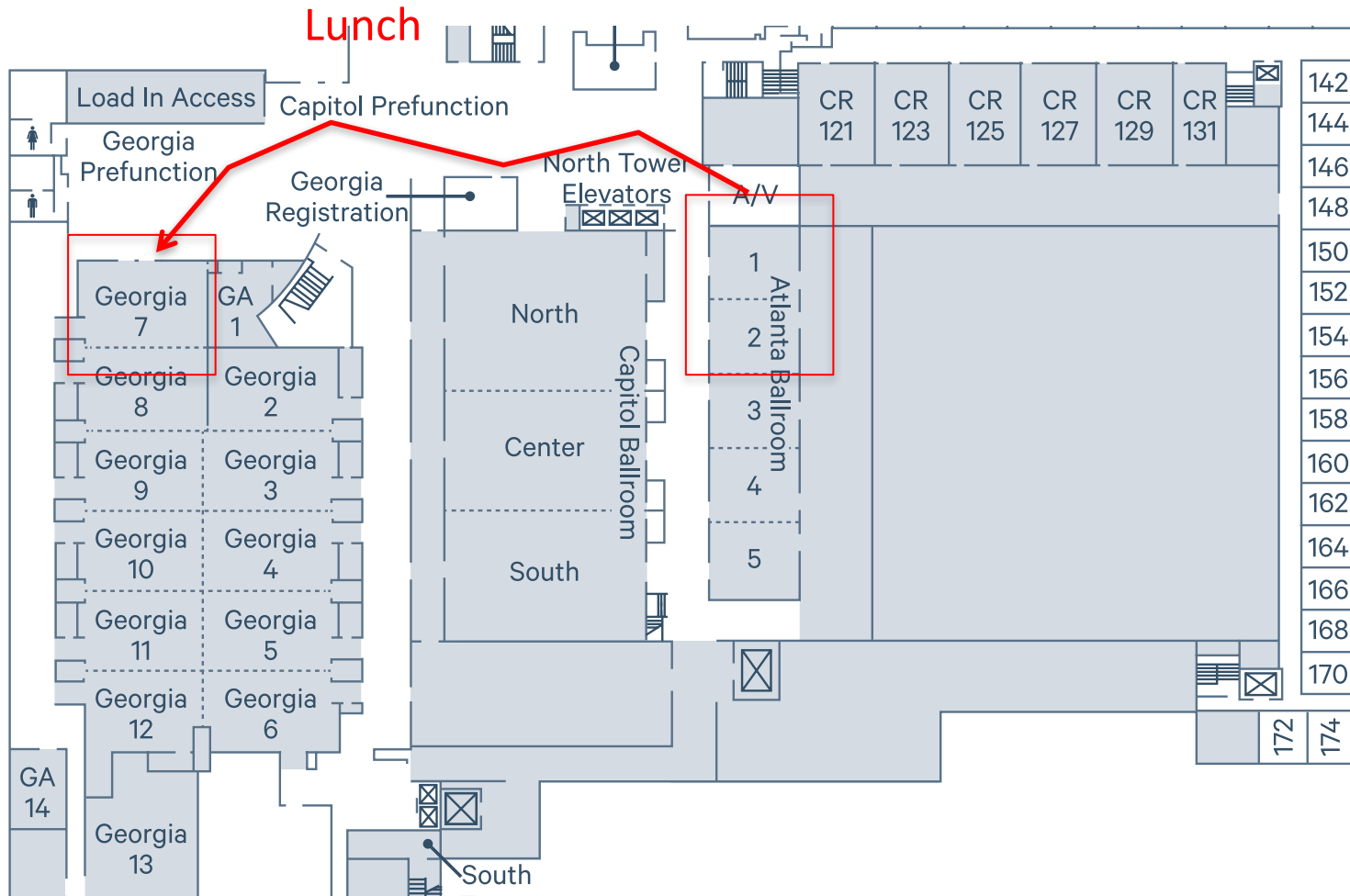
Reimbursements

- Fill the basic information form (sent to you via email)

- Scan your hotel receipt

- Submit them to https://www.cs.wisc.edu/cstravel

Panel A

Topic 1. Smart network architectures and applications

- Research challenges in emerging smart network architectures and applications.

- Examples include:
  - Smart radios
  - Internet of Things (IoT)
  - Autonomous vehicular networks, drone networks
  - Mobile sensing, radio-based sensing
  - Mobile social networks, localization, tracking
  - Wearable and implant communication
  - Immersive virtual reality on mobile devices.

Panel A

Topic 2. Smart network analysis, protocols, and optimization

- Streamline network designs, create upper layer end-to-end networking protocols and achieve optimized network performance
  - Leverage data analytic techniques, in particular, big data and machine learning
  - Evolution of routing and transport layer protocols from their well tested classical wireless counterparts
  - Identify the open challenges in cross-layer protocol designs.

Panelists

Henning Schulzrinne
Columbia University

Eytan Modiano
MIT

Mouli
Stevens Institute of Technology

Samir Das
Stony Brook University

Questions

- What are the new enabling technologies in context of "smart networks"?

- What are the new fundamental challenges and research problems that the community must address in priority?

- How can we harness the knowledge from interdisciplinary domains and yet not lose sight of the core networking challenges?

- What types of support would you like to build next generation industrial-academic collaborations, and international collaborations

- How can these efforts stimulate new forms of broader impacts?

Panel B

Topic 3. Security & privacy

- Characteristics, performance and security requirements of smart networks vary considerably from one system to another
  - New fundamental security and privacy problems in smart networking and communication
  - Security/privacy issues stemming from dynamic and diverse network connectivity, weak device protection
  - Security schemes that operate under limited computing power, storage space, and energy supply.

Panel B

Topic 4. City-scale smart network testbed platforms

- Obtaining repeatable experimental results is a critical need of the wireless community today
  - What kind of experimental systems the community wishes to use at the city-scale?
  - What outcomes/results will be interesting to the community?
  - How to make the resources available to encourage development and participation
  - How to overcome the learning curve needed to use such platforms
  - Other large scale investment programs by NSF, such as Platforms for Advanced Wireless Research (PAWR)

Panel B

Yingying Chen
Stevens Institute of Technology

Marco Gruteser
Rutgers University

Bhaskar Krishnamachary
USC

Prasun Sinha
The Ohio State University

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