58311103 Seminar: Hot topics in mobile computing (3 cr)

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17.1.2011

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Practical Info

- Time and place:
  - 17.01.-21.02. Mon 12-14 B119,
  - 14.03.-25.04. Mon 12-14 B119
- Seminar will be held in English

Introduction

- This seminar focuses on hot topics in mobile computing.
- We focus on recent research systems and results published in conferences such as Mobicom, Percom, Pervasive, and Mobisys.
- Seminar topics include energy awareness and optimization, Internet protocols, mobile application development, and security and privacy.
- **The aim of the seminar is to identify and discuss recent developments in the area**

Completing the Seminar

- In order to successfully complete the seminar, you need to perform the following four tasks:
  - Write a paper about a topic agreed during the first meetings.
  - Review at least one seminar paper.
  - Prepare and give a presentation.
  - Participate in the seminar by being active during the sessions.

Working Mode

- The seminar is structured in two parts.
  - In the first phase, the students select a topic and prepare an article that surveys and discusses the topic.
  - The articles are then presented during the second part of the seminar.
  - A good length for the paper is about 6-7 pages using the IEEE Transactions format.
    - http://www.ieee.org/pubs/authors.html
  - The presentations are about 20 minutes in length.

Presentation

- Prepare presentations (about 20 mins)
  - Short motivation
  - Problem statement / scoping
  - Overview of border-constraints
  - Solutions
  - Takeways (what will audience get from your presentation)

Grading

- The grading will be based on the written article (40%), the presentation (40%), and activity during the seminar (20%).

- Participation to the seminar sessions are mandatory (80% participation is minimum).

Deadlines

- First session on 17.1.
- Paper discussions on 24.1. with Dr. Rao
- Checkpoint session on 7.2.
- Paper finished by 14.3.
- Reviews done by 21.3.
- Presentations will be scheduled on and after 21.3.
  - 6 weeks for presentations
  - 24 presentations, 4 presentations per day, 20 minute presentations

Schedule (to be filled)

- 21.3. Presentations 1
- 28.3. Presentations 2
- 4.4. Presentations 3
- 11.4. Presentations 4
- 18.4. Presentations 5
- 25.4. Presentations 6

More information about topics and relevant scientific articles

- High-level topics
  - Mobile devices and energy issues
  - Caching
  - Content delivery
  - DTNs, social networks, routing
  - Cloud-assisted systems
  - Privacy
  - Sensor networks
  - Positioning

Mobile Devices and Energy Issues

- 1. Y. Agarwal, R. Chandra, A. Wolman, P. Bahl K. Chin, and R. Gupta. Wireless wakeups revisited: energy management for voip over wi-fi smartphones. In MobiSys '07: Proceedings of the 5th international conference on Mobile systems, applications and services, pages 179-191, New York, NY, USA, 2007. ACM.
- 2. S. Smaldone, B. Gilbert, N. Bila, L. Iftode, E. de Lara, and M. Satyanarayanan. Leveraging smart phones to reduce mobility footprints. In Proceedings of the 7th international conference on Mobile systems, applications, and services (MobiSys '09), pp. 109-122 2010.
- 3. Xiao, Y., Savolainen, P., Karppanen, A., Siekkinen, M., Ylä-Jääski, A.: Practical power modeling of data transmission over 802.11g for wireless applications. In: e-Energy. pp. 75–84 (2010)
- 4. Balasubramanian, N., Balasubramanian, A., Venkataramani, A.: Energy consumption in mobile phones: a measurement study and implications for network applications. In: Internet Measurement Conference. pp. 280–293 (2009)

Caching

- 5. On Cooperative Caching in Wireless P2P Networks (ICDCS08)
- 6. Ditto: a system for opportunistic caching in multi-hop wireless networks (mobicom08)
- 7. SSUM: Smart Server Update Mechanism for Maintaining Cache Consistency in Mobile Environments (TMC'10)

Content

- 8. Searching for Content in Mobile DTNs (percom09)
- 9. A survey of data replication techniques for mobile ad hoc network databases (VLDBJ 08)
- 10. Content based multicast (CBM) in ad hoc networks (mobihoc00)
- 11. Persistent Content-based Information Dissemination in Hybrid Vehicular Networks (percom09)
- 12. Search-based picture sharing with mobile phones (mobihoc09)
- *13. SMS-Based Mobile Web Search for Low-End Phones*,
  Jay Chen (New York University), Lakshminarayanan Subramanian (New York University), Eric Brewer (New York University), Mobicom 2010

DTNs, social networks, routing

- 14.Replication Routing in DTNs: A Resource Allocation Approach (sigcomm07)
- 15.Socially-Aware Routing for Publish-Subscribe in Delay-Tolerant Mobile Ad Hoc Networks (jsac08)
- 16. Multicasting in Delay Tolerant Networks: A Social Network Perspective (ACM Mobihoc, 2009)
- *17. Whirlpool Routing for Mobility*, Jung Woo Lee (EE Dept., Stanford Univ., US); Branislav Kusy (Stanford University, US); Basem Shihada (University of Waterloo, CA); Tahir Azim (Stanford University, US); Philip Levis (Stanford, US), Mobihoc 2010

Cloud-assisted systems

- 18. R. Wolski, S. Gurun, R. Krintz, and D. Nurmi, “Using bandwidth data to make computation offloading decisions,” in in Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS 2008), High-Performance Grid Computing Workshop, 2008.
- 19. K. Kumar and Y.-H. Lu, “Cloud computing for mobile users: Can offloading computation save energy?” Computer, vol. 43, pp. 51–56, 2010.
- 20. L. Rudolph, “A virtualization infrastructure that supports pervasive computing,” IEEE Pervasive Computing, vol. 8, no. 4, pp. 8–13, 2009.
- 21. E. Cuervo, A. Balasubramanian, D. ki Cho, A. Wolman, S. Saroiu, R. Chandra, and P. Bahl, “MAUI: Making Smartphones Last Longerwith Code offload,” in Proc. ACM Mobisys, June 2010.

Privacy

- 22. Chow, C.Y., Mokbel, M.F., Liu, X.: A peer-to-peer spatial cloaking algorithm for anonymous location-based service. In: GIS '06: Proceedings of the 14th annual ACM international symposium on Advances in geographic information systems. pp. 171–178. ACM, New York, NY, USA (2006)
- 23. Yiu, M.L., Jensen, C.S., Huang, X., Lu, H.: Spacetwist: Managing the trade-offs among location privacy, query performance, and query accuracy in mobile services. In: ICDE. pp. 366–375 (2008)
- 24. TreasurePhone: Context-Sensitive User Data Protection on Mobile Phones. Julian Seifert, Alexander De Luca, Bettina Conradi, Heinrich Hussmann. Pervasive 2010.

Sensor networks

- 25. Negotiate power and performance in the reality of RFID systems. Percom 2010.
- 26. Jun Yuan, Zongpeng Li, Wei Yu and Baochun Li, "A Crosslayer Optimization Framework for Multihop Multicase in Wireless Mesh Networks", in IEEE Journal on Selected Areas in Communications, 2006

Positioning

- 27. Virtual Compass: Relative Positioning to Sense Mobile Social Interactions. Nilanjan Banerjee, Sharad Agarwal, Paramvir Bahl, Ranveer Chandra, Alec Wolman, Mark D. Corner. Pervasive 2010.
- 28. Fingerprinting Mobile User Positions in Sensor Networks. Mo Li, Xiaoye Jiang and Leonidas Guibas. ICDCS 2010.

Additional topics

- ACM Mobiheld 2010
  - http://conferences.sigcomm.org/sigcomm/2010/mhcfp.php
- Procedings of Mobihoc, Mobicom, ICDCS, Percom, Pervasive

Next steps

- In the next two weeks, please choose a topic
- By 7.2. you will have the topic and a timeslot for the presentation. At this point you can indicate the paper you would like to review.