Term Project Description
EEC 687/787 Mobile Computing, Spring 2007

The project consists of four parts, which is done by each individual, and must involve simulations based on ns-2.

March 5: Project title and goal

- Abstract (one paragraph)

Mar. 21: Progress report and presentation

- Progress report (three to five 1.5-spaced pages with 11-point font, no cover page) and presentation (10-15 minutes using powerpoint slides)
- It should include background study on your topic
- Start with the complete title of your report, your name, and your student ID number.
- Copying text from the publicly available information without reference is regarded as "cheating"

April 11: Progress report

- Progress report (five to ten 1.5-spaced pages with 11-point font, no cover page)
- It should include methodology and preliminary results (excel or xgraph charts)

May 2: Final report and presentation

- Final report (seven to fifteen 1.5-spaced pages with 11-point font, no cover page) and presentation (15-20 minutes using powerpoint slides)

General guideline

The report should include a description of the project and why this is an interesting problem. In addition, write about the simulator, simulation parameters, simulation factors, and result variables. In the report, add a few papers that are relevant to your project. For each paper, you must give the complete citation, which includes the names of the authors, the title of the paper, the title of the journal or conference proceedings in which it appeared, the date, and the page numbers. And write a summary which results these papers have shown for the similar problem at hand.

The final report for your project must include at least the following:

a) A descriptive title.
b) A 200-300 word abstract summarizing what you've done.
c) An introduction precisely stating the problem and explaining why this problem is interesting.
d) A description of your methodology.
e) An explanation of your results. Also, you must include appropriate figures, graphs, and tables to explain your results. Each figure, graph, and table must be directly referenced in the text. For example, you should say something like, "Figure X shows ..." instead of simply inserting the figure into the paper with no explanation.
f) A conclusion summarizing what you've done and what it means in a broader context.

Grading: 40% of total grade.
Project will be graded using the following sample criteria:

Effort	20
Background development (explanation of prior work, etc.)	20
Results or Survey analysis	20
Document (organization, grammar, etc.)	20
Presentation (slide quality, clear language, etc.)	20
Total	100

The basic idea of this grading scheme is to deemphasize the importance of the actual results you achieve and instead to determine if you developed your project logically and completely, whether you described it thoroughly and clearly, and if you correctly understand the concepts you learned in this course.

Possible topics:

I. Multirate control in mobile multihop networks

- G. Holland, N. Vaidya, and P. Bahl. A Rate-Adaptive MAC Protocol for Multi-Hop Wireless Networks. ACM MobiCom, 2001.
- H. Zhai and Y. Fang. Physical Carrier Sensing and Spatial Reuse in Multirate and Multihop Wireless Ad Hoc Networks. IEEE International Conference on Computer Communications (INFOCOM06), 2006.
- B. Awerbuch, D. Holmer, and H. Rubens. Effects of Multi-rate Ad Hoc Wireless Networks. Johns Hopkins University, Technical Report.

II. Power save mode operation of IEEE 802.11 in mobile multihop networks

- H. Woesner, J. Ebert, M. Schlager, and A. Wolisz. Power-Saving Mechanisms in Emerging Standards for Wireless LANs: The MAC Level Perspective. IEEE Personal Communications, 5(3):40–48, Jun 1998.
- R. Zheng and R. Kravets. On-Demand Power Management for Ad Hoc Networks. IEEE INFOCOM, pages 481–491, 2003.
- S. Lim, C. Yu and C. Das. Rcast: A Randomized Communication Scheme for Improving Energy Efficiency in Mobile Ad Hoc Networks. IEEE ICDCS, 2005.

III. Transmit power control in wireless sensor networks

- C. Yu, K. G. Shin, and B. Lee. Power-Stepped Protocol: Enhancing Spatial Utilization in a Clustered Mobile Ad Hoc Network. IEEE Journal on Selected Areas in Communications (J-SAC), 22(7), Sep. 2004, 1322-1334.
- S. Narayanaswamy, V. Kawadia, R. S. Sreenivas, and P. R. Kumar. Power Control in Ad-Hoc Networks: Theory, Architecture, Algorithm and Implementation of the COMPOW Protocol. European Wireless, 2002.
- E.-S. Jung and N. H. Vaidya. A Power Control MAC Protocol for Ad Hoc Networks. ACM MobiCom, 2002.

IV. Multihop routing operation in urban mesh networks

- J. Broch, D. Maltz and D. Johnson. Supporting Hierarchy and Heterogeneous Interfaces in Multi-Hop Wireless Ad Hoc Networks. I-SPAN, 1999.

- H. Lei and C. E. Perkins. Ad Hoc Networking with Mobile IP. EPMCC, 1997.
- S. Mehra and C. Yu. Enhancing the Performance of Mobile Ad Hoc Networks with the Aid of Internet Gateways. ICWN, 2004.

V. TDMA-based medium access in wireless sensor networks

- S. Datta. RMAC: a randomized adaptive access control algorithm for sensor networks, Workshop on Sensor and Actor Networks and Protocols, 2004.
- W. Heinzelman, A. Chandrakasan, and H. Balakrishnan. Energy-Efficient Communication Protocol for Wireless Microsensor Networks. HICSS, 2000.
- M. J. Miller and N. H. Vaidya. On-Demand TDMA Scheduling for Energy Conservation in Sensor Networks, Technical Report, June 2004.
- C. Yu, K. Shin, K. Tatapudi, and S. Kalubandi. Design and Analysis of Bulk Synchronous Medium Access Protocol. MCRL (Mobile Computing Research Lab.), ECE Dept., CSU, August 16, 2006.

VI. Clustered mobility model in mobile multihop networks

- J. Yoon, M. Liu, and B. Noble. Random Waypoint Considered Harmful. IEEE INFOCOM, 2003, pp. 1312–1321.
- J. Amit, B. Elizabeth, A. Kevin, and S. Subhash. Towards Realistic Mobility Models for Mobile Ad Hoc Networks. IEEE MOBICOM, 2003.
- L. Guolong, N. Guevara, and R. Rajmohan. Mobility Models for Ad Hoc Network Simulation. IEEE INFOCOM, 2004.
- S. Lim, C. Yu and C. Das. Clustered Mobility Model for Scale-Free Wireless Networks. IEEE LCN, 2006.

VII. Cooperative communication in mobile multihop networks

- S. Moh, C. Yu, S.-M. Park, and H.-N. Kim. CD-MAC: Cooperative Diversity MAC for Robust Communication in Wireless Ad Hoc Networks. IEEE ICC, 2007.
- S.-H. Chen, U. Mitra, and B. Krishnamachari. Cooperative Communication and Routing over Fading Channels in Wireless Sensor Networks. IEEE WirelessCom, Jun. 2005.
- A. Scaglione, D. L. Goeckel, and J. N. Laneman. Cooperative Communications in Mobile Ad-Hoc Networks: Rethinking the Link Abstraction. IEEE Signal Processing, 2006.
- A. Azgin, Y. Altunbasak, and G. AlRegib. Cooperative MAC and Routing Protocols for Wireless Ad Hoc Networks. IEEE GLOBECOM, 2005.

VIII. Packet salvaging with multipath routing

- C. Yu, K. G. Shin, and L. Song. Link-Layer Salvaging for Making Routing Progress in Mobile Ad Hoc Networks. ACM MobiHoc, 2005.
- S. Biswas and R. Morris. Opportunistic Routing in Multi-Hop Wireless Networks. The Second Workshop on Hot Topics in Networking (HotNets-II), 2003.
- B. Sadeghi, V. Kanodia, A. Sabharwal, and E. Knightly. Opportunistic media access for multirate ad hoc networks. IEEE/ACM MobiCom, 2002.
- M. Zorzi and R. Rao. Geographic Random Forwarding (GeRaF) for ad hoc and sensor networks: energy and latency performance. IEEE Tran. Mobile Computing, 2(4), 2003.