COMP 6777 – Mobile Ad Hoc Networking

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Scope

This course covers advanced topics in mobile ad hoc networking (MANET), one of the most typical wireless networking technologies for Internet-of-Things (IoT). Two thirds of the course will be lectures delivered by the instructor. The lectures cover both the fundamentals of MANET architectures, network queueing analysis, link-layer channel/medium access control mechanisms (e.g., CSMA/CA, TDMA), routing algorithms (e.g., Bellman-Ford algorithm, Dijkstra algorithm). One third of the course will be state-of-the-art research paper presentations and simulation projects conducted by students. The goal of the course is not only to convey significance of the related research frontiers and technological development, but also to provide a basis upon which students would be able to develop interests in doing research in potential areas.

Reference book

This course does not require a textbook, but some of the important topics can be found in the following references.

1) Recently published research papers in mobile ad hoc networks.

2) Schwartz, M., Broadband Integrated Networks, Prentice Hall, 1996 (ISBN-13: 978-0135192405; ISBN-10: 0135192404).

3) Bertsekas, D., and R. Gallager, Data Networks (2nd edition, online version available), Prentice Hall, 1992 (ISBN 0132009161).

Evaluation

The course evaluation has the following components:

- 40% - Paper presentation

- 30% - Class attendance/participation (in instructor's lectures and in peer student presentations)
- 30% - Project

Topics

- Wireless communication networks
- Mobile ad hoc networking introduction
- Typical MANET application scenarios
- Network queueing analysis
- Link-layer medium access control
- Routing algorithms
- Performance analysis and QoS provisioning
- Simulation

Paper Presentations

- Search and read state-of-the-art research articles on mobile ad hoc networking, and present the studied research problems, methodology used, and research insights observed in the papers.

Projects

- Queueing simulation
- Link-layer packet retransmission/Network-layer routing
- Encapsulation and network utilities