# CSCI 8980: TOPICS in MOBILE COMPUTING (Spring '19)
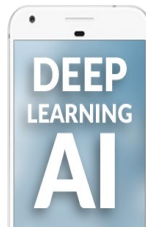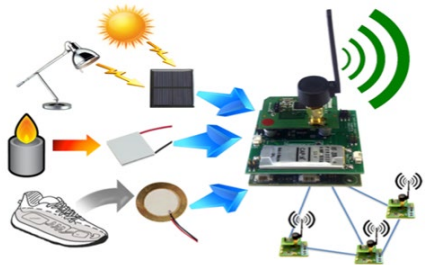
Computer Science and Engineering
University of Minnesota – Twin Cities

Feng Qian, http://fengqian.org



- **Basic Information**

| | |
|---|---|
| Credits: | 3 |
| Lecturer: | Feng Qian (fengqian@umn.edu), Keller Hall 4-203 |
| Teaching Assistant: | None |
| Time/Location: | 6:30P-9:00P Monday, Akerman Hall 227 |
| Textbook: | None |
| Office Hour: | Appointment only |
| Canvas URL: | https://canvas.umn.edu/courses/108531 |

- **Course Description**
  Mobile computing has become part of our daily life. This course will cover various topics of mobile computing, networking, and systems, including but not limited to: applications of smartphones, cellular networks, embedded sensor systems, localization systems, energy efficiency of mobile devices, wearable and vehicular mobile systems, mobile security, virtual reality/augmented reality, mobile AI/deep learning, and so on. We will discuss research papers from top conferences, brainstorm cool ideas, and build real mobile systems through team projects.

- **Prerequisites**
  Have taken undergraduate-level Operating System or Computer Networking. Programming experience on mobile devices is a plus for the project, but not required.

- **Grading Policy**
  Project: 50% (Proposal report: 5%, Status report: 5%, Final report: 40%)
  Paper summary: 35%
  In-class presentation: 5%
  Attendance: 10%

- **Course Format**
  In most lectures (called "regular" lectures), we will discuss one or two particular topics. First, one or two students will each give a ~25-minute presentation of a paper he or she selects. Then the instructor will give some overview and cover the remaining paper(s), followed by discussions. Some lectures are allocated for your project, including idea brainstorming, proposal presentations, and final project presentations. We will also have one or two guest lectures.

- **Your Responsibilities**
  1. Before a regular lecture, turn in summaries for **two** papers.
  2. Do one 25-minute presentation of one paper on a regular lecture.
  3. Try your best on the project. Observe three key deadlines of: project proposal, status report, and the final report.

- **Paper Summary**
  You need to submit two (and only two) summaries of one paper before each regular lecture. The papers (usually 3 to 5) to be discussed in each lecture will be posted in Canvas about 2 weeks before the lecture date. You are free to select any two papers among them. A good summary should include the following key points:

  1. What is the problem the paper tries to solve?
  2. What is the high-level approach used?
  3. What are the key results?
  4. How does this work advance the state-of-the-art?
  5. What are the limitations of the work?
  6. What is the potential future work enabled by this paper?

  The summaries must be submitted electronically via Canvas before the lecture starts (**6:30pm on Monday**). The grade, in the scale of 0 to 3, can be one of the following: 3 (above average), 2 (average), 1 (below average), or 0 (no submission or invalid submission). Late submission will also receive 0 without any exception.

- **Project Guidelines**
  The project is a key component of this course. A project can be either an individual project or a team project (involving no more than **two** students). The merit of your project will be evaluated by the following metrics.
  1. Novelty - How novel is your proposed idea compared to the state-of-the-art?
  2. Design - Do you have a good design of your system / measurement / experiments?
  3. Implementation - How solid is your implementation?
  4. Report - Is the final report well written?
  5. Individual contribution - What is your individual contribution within the team (for team project)?

  To keep good progress, three documents must be submitted before their deadlines. For a team project, the whole team must submit **one unified version of each document** instead of having each member submitting his/her own.
  - Project proposal (1~2 pages single column, 11 pt font).
  - Status report (1~2 pages single column, 11 pt font).
  - Final report (at least 6 pages double columns, 10 pt font, in ACM format).
  LaTeX and Microsoft Word templates for the project report will be available on Canvas.

- **Late Policy**
  **Late submissions of paper summaries receive no credit.** Late submissions of project documents (proposal, status report, and final report) receive partial credit, as follows.
  Late for no more than 12 hours: 80% of the credits.
  Late for more than 12 hours but no more than 24 hours: 70% of the credits.
  Late for more than 24 hours but no more than 48 hours: 60% of the credits.
  Late for more than 48 hours: no credit.

- **Course Schedule**
  See the next page.

Note that the schedule is tentative and is subject to change. Always keep an eye on Canvas for latest announcements and updates.

| Date | Topic |
|---|---|
| 1/21 | No class, MLK day |
| 1/28 | Course overview, logistics, project ideas |
| 2/4 | **Topic A**: energy consumption of smartphones |
| 2/11 | **Topic B**: mobile web and redundancy elimination |
| 2/18 | **Topic C**: mobile networking |
| 2/25 | **Topic D**: smartphone applications |
| | **Project Proposal Deadline: 11:59 PM CST, 2/26** |
| 3/4 | **Topic E**: mobile video streaming<br>**Project proposal presentation** |
| 3/11 | **Topic F**: wearable systems |
| 3/18 | No class, spring break |
| 3/25 | **Topic G**: sensing systems |
| 4/1 | **Topic H**: localization systems |
| | **Project Status Report Deadline: 11:59 PM CDT, 4/2** |
| 4/8 | **Topic I**: mobile cloud computing, user interface on mobile devices |
| 4/15 | **Topic J**: vehicular systems, visible light communication |
| 4/22 | **Topic K**: mobile security<br>Final project report guide |
| 4/29 | **Topic L**: selected new topics |
| 5/6 | **Final presentation (with Dinner provided!)** |
| | **Final Report Deadline: 11:59 PM CDT, 5/13** |