Syllabus for CMSC 691: Special Topics: Big Data in Smart Community
Spring 2018

Course:
Lecture Time: M, W, 2:30 - 3:45 pm, ITE 233
Office Hours: M, W, 1:30 - 2:30 pm, and by appointment, Location: ITE 360

Instructor: Dr. Ting Zhu, E-mail: zt@umbc.edu

TA: Vedmurty Chavan, E-mail: ved1@umbc.edu

TA office hour: Tue 12-1pm, Location: ITE 344

Class web page: All class materials are available at http://blackboard.umbc.edu

Course Descriptions: Internet of Things (IoT) and Cyber-Physical Systems (CPS) involve connecting smart devices and systems, in diverse sectors such as transportation, energy, manufacturing, and healthcare, in fundamentally new ways and generate huge amount of data. These new technologies and big data will enable cities and communities to improve services, promote economic growth, and enhance the quality of life. The goal of this course is to understand the fundamental and practical issues in designing and analyzing smart and connected communities. To investigate system design, middleware design, monitoring, scheduling, big data management and control issues in the full lifecycle of CPS design and implementation. We will study merging applications in smart and connected communities, including mobile computing, mobile social networks, smart grids, smart health, smart transportation, and cloud of things. Course projects on design and simulation in smart and connected communities consolidate students understanding, and further strengthen their practical problem-solving and programming skills. Students are required to have some programming skills, and basic knowledge in operating systems, networking, and embedded systems.

Textbook: No required textbooks.

Other References:
• Many recent papers in leading conferences/journals will be discussed.
• Matthew A. Russell, Mining the Social Web: Analyzing Data from Facebook, Twitter, LinkedIn, and Other Social Media, O'Reilly Media, 1 Edition, February 8, 2011.
• Dan Sanderson, Programming Google App Engine: Build and Run Scalable Web Apps on Google's Infrastructure, OReilly, 2009.

Materials to be Covered: The introduction of big data algorithms, security and privacy issues of systems for smart and connected communities including but not limited to smart transportation, smart water systems, smart medical systems, smart farm, and smart buildings, and etc.

Grading:
Your performance will be evaluated based on the following
Class Participation 10%
Paper Critiques 20%
Paper Presentation 30%
Project 40%

Scale for final grades: Grades will be assigned on the following scale. I reserve the right to lower or raise the scale as needed. This is generally only necessary to ensure borderline grades are appropriately assigned a letter grade although it may be necessary to adjust for overly hard or overly easy assignments.

A: 90 – 100
B: 80 – 89
C: 70 – 79
D: 60 – 69
F: < 60

Paper Critiques: Two paper critiques per week will be assigned in this semester. Each critique is due in email 2 hours before the corresponding class start. I also require you to hand in a hard copy (one page, single-spaced) of the critiques in class (before the class starts). Late submission is NOT allowed.

Paper Presentation:
Each presentation lasts for 50 minutes plus 25 minutes for question answering. The presentation should not only cover the in-depth discussion of the paper, but also all necessary background and related work for the class to fully understand the technical approach described in the paper.

Besides answering any questions raised by the class, the presenter will also be asked questions by challengers that are assigned by instructor. A challenger should ask critical questions about the paper and his/her performance will be counted in the ‘class participation’.

The evaluation criteria of presentation include clarity, organization, technical content, and question answering. Each student (excluding the presenter) will score the presentation, and the average of all scores will be the score of the presentation.
**Final Project:** Each student needs to complete a project on a selected problem. Detailed requirements of the final project will be handed out in the middle of the semester.

**Academic Integrity Statement:** “By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC’s scholarly community in which everyone’s academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To find useful information about avoiding plagiarism infractions through appropriate citations, or to read the full policy regarding student academic misconduct for the graduate school, please see [http://www.umbc.edu/provost/integrity](http://www.umbc.edu/provost/integrity).”