CMSC 628
Mobile Networks
Syllabus

Catalog listing: CMSC 628
Course Level: Graduate
Prerequisites: Graduate student standing in Computer Science or related discipline or acceptance into five-year accelerated program in Computer Science

Instructor: Eyuphan Bulut
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Classroom: ~~Engineering West 105~~ **(Over Zoom until further notice)**
Class website: Canvas (https://virginiacommonwealth.instructure.com/)
Office Hours: TR 4:30-5:30 PM

1.0 – Overview (Catalog Course Description):

Semester course; 3 lecture hours. 3 credits.
Prerequisites: Graduate student standing in Computer Science or related discipline or acceptance into five-year accelerated program in Computer Science.
The course will assume undergraduate-level background in algorithms, programming (e.g., Java), calculus, and probability. Upon successful completion of this course, the student will be able to understand the major concepts about mobile networks; be familiar with various mobile network applications (e.g., ad hoc and sensor networks, mobile social networks, delay tolerant networks, vehicular networks and cellular networks); learn how to model mobile networks with stochastic processes and real datasets; be able to use different networking simulators; understand various routing algorithms and analyze their behavior.

2.0 – Course Structure:

Lecture hours/week – 3
Lab hours/week – 0

3.0 – Course Goals

Upon successful completion of this course, the student will be able to:

1. Understand and characterize various mobile network applications.
2. Learn how to model mobile networks with stochastic mobility models and real datasets.
3. Develop routing algorithms and analyze their behavior through simulations.

4. Identify the challenges in mobile networks and provide solutions.

4.0 – Major Topics Covered:

- Different mobile network applications (e.g., Ad hoc and sensor networks, Delay tolerant networks, Mobile Social Networks, Vehicular networks) and challenges
- Device-to-Device communication technologies (e.g., Bluetooth, WiFi-Direct, LTE-direct)
- Routing algorithms for content distribution and delivery
- Mobility models
- Mathematical tools to analyze and model mobile networks
- Network simulators (ns-2, ONE etc.)
- Data driven simulations and evaluation
- Emerging Networks and Technologies (Internet of Things, Machine to Machine Networks, Connected cars, DSRC, Aerial networks)

5.0 – Textbook(s): not-required, recommended.

There is no required textbook. Class notes will be posted in Canvas.
Some Recommended Books:

- "Mobile ad hoc networking: the cutting edge directions" / edited by Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenovic. – Second edition.
- "Mobile Ad Hoc Networks: Current Status and Future Trends" by Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, CRC Press

6.0 – Class Schedule:

- Lecture: TR, 5:30-6:45pm, ~~ENGR West 105~~ (zoom until further notice).

7.0 **– Evaluation:**

Attendance & Class Participation	(10 %)
Assignments	(20 %)
Paper presentations/reviews	(20 %)
Exam	(15 %)
Project	(35 %)

Grading scheme:

A	>= 90%
B	>= 80% and < 90%
C	>= 70% and < 80%
D	>= 60% and < 70 %
F	< 60%
