Opportunistic communication is an active research area in wireless sensor networks. Exploiting the opportunities to communicate between devices in an unstable network is one of the main challenges of the opportunistic communication. In this thesis, we propose an infrastructure-independent opportunistic mobile social networking strategy for efficient message broadcasting in campus environments. Specifically, we focus on the application scenario of university campuses. In our model, the students’ smart-phones forward messages to each other. The messages are created spontaneously as independent events in various places of the campus. The events can be either urgent security alerts or private announcements to the students currently on the campus. Our proposed state-based campus routing (SCR) protocol is based on the idle and active states of the students in indoor and outdoor places. The proposed model is analyzed through extensive network simulations using mobility datasets collected from students on University of Milano, University of Cambridge and University of St Andrews campuses. The opportunistic network model and the SCR protocol is compared with epidemic, epidemic with TTS (Times-To-Send), PROPHET, NDAO (Nodes Density Aware Opportunistic) and random routing protocols. The message delivery performance of SCR is close to Epidemic, PROPHET and NDAO while SCR reduces the amount of message transmissions.

Major: Computer Science

Educational Career:
Bachelor's of Computer Engineering, BS, 2009, Bilkent University

Committee in Charge:
Damla Turgut, Chair, Computer Science
Mostafa A. Bassiouni, Computer Science
Ratan K. Guha, Computer Science

Approved for distribution by Damla Turgut, Committee Chair, on November 5, 2015.

The public is welcome to attend.