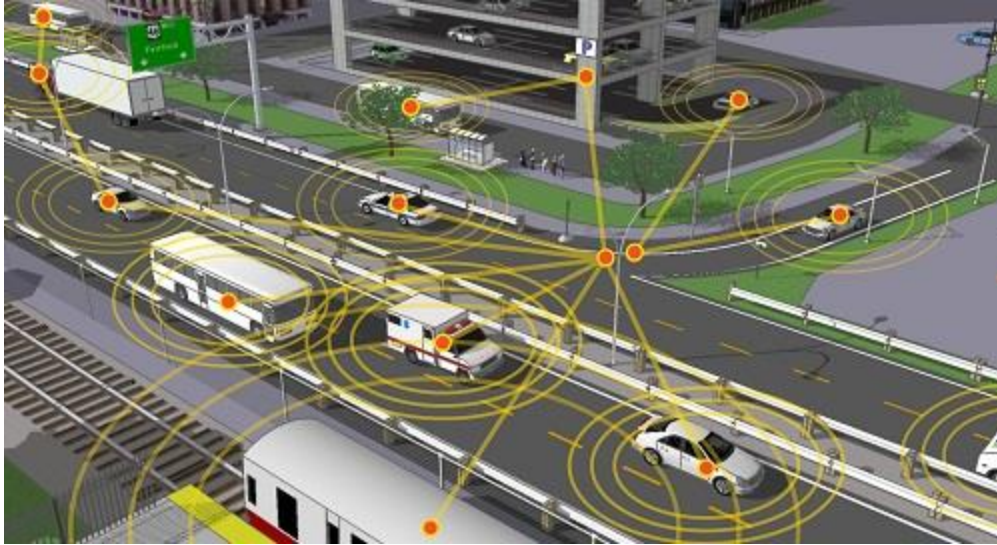# CaRDS Seminar

Smart Transportation Applications aided by Graph Theoretical Approaches

Presented by: Mohammad "Asad" Hoque, PhD

Director, Vehicular Network Lab & Assistant Professor of Computing

Abstract:

This research talk focuses on the applications of graph theoretical approaches for solving complex transportation network problems that involve connected and autonomous vehicles, where vehicles can talk among each other as well as communicate with the city infrastructure. The wireless technology that enables the communication between vehicles and infrastructure is known as Dedicated Short Range Communication (DSRC). The talk will present a novel transportation application that was recently developed at the Vehicular Network Lab of ETSU that provides drivers with lane merge advisories in freeway entrance ramps, using vehicle trajectories obtained through DSRC. It was successfully tested on a freeway using three vehicles, then targeted for further testing, via simulation. The failure of contemporary simulators to effectively model large, complex urban transportation networks then motivated further research into distributed and parallel traffic simulation. An architecture of Integrated Distributed Connected Vehicle Simulation (IDCVS) platform was designed where we identify the challenges and issues involved with multi-level parallelism for emulating real-time traffic in a large metro area. We also discuss a mechanism for efficient networking partitioning of large transportation networks by incorporating real-world traffic parameters like signalized intersection, road segment length, traffic density, and the number of lanes. The primary objective of this partitioning scheme is to reduce the inter-process (or partition) communication (IPC) overhead for distributed simulation in a parallel computing environment.

Friday, April 21st at 3:15 pm

Room 106 of Gilbreath Hall

Everyone Welcome!