New Research Directions in Intelligent Transportation

Intelligent Transportation Systems (ITS) have been researched and developed since the 1970's but their impact so far has been relatively small. In this talk I will argue that this is about to change and that these systems will soon revolutionize urban transportation. I will discuss novel applications that improve safety, mobility, environmental impact, and energy efficiency. The applications epitomize ITS efforts currently undertaken throughout the world, e.g., the IntelliDrive initiative of the US Department of Transportation. Focusing information management, I will argue that ranking is a fundamental operation in an environment where travelers and billions of sensors embedded in the infrastructure, in vehicles, and in portable devices generate vast amounts of data. Two ranking paradigms will be discussed, one using game theory and the other using machine learning. I will also relate these efforts to our NSF-sponsored IGERT PhD program in Computational Transportation Science.