Could radio technology improve public transportation? A CTG team finds out

As you ride UAlbany’s transportation this semester, you probably didn’t realize you are actually helping a CTG research team determine the effectiveness of a new radio technology that is being considered by cities worldwide as they invest in the Internet of Things (IoT).

A research team from the Center for Technology in Government and the Signals & Networks Lab in the College of Engineering & Applied Sciences is working with Parking and Mass Transit and the Office of Facilities Management to study the feasibility of using ultra-wideband (UWB) technology, a wireless radio system that uses a small amount of energy to transmit large amounts of data over a wide range of frequency bandwidths to allow for ranging and localization at the same time. UWB technology is just one type of technology that can power the IoT, such as in smart streetlights that dim at certain hours or sensors in parking garages that allow citizens to find available parking with the help of a smartphone app. UWB can also be used in public transportation, with the potential benefits including:

• Better tracking of trains and buses to help with scheduling and mitigating delays
• Improving the fare payment process by eliminating the need for turnstiles, tickets or cards (such as the UWB technology sensing your public transportation card in your pocket)
• Detecting potential obstacles in front of the train or bus to improve safety

However, while these benefits sound promising, it is not clear if UWB can actually meet the demands placed on it within the context of a live public transportation infrastructure. To help build new understanding of what is really possible, the team, including PhD students Priti Pachpande and Ahmed Hussein, is investigating three key questions:

• Will the UWB technology integrate well into the existing technology systems used in the city?
• How accurate is the UWB technology, for example can it detect the buses’ location with 10cm accuracy?
• Is UWB consistent and resilient?