University of New Hampshire

UNH TODAY

Smart Campus

Interdisciplinary project could make parking on campus easier

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ON A "SMART CAMPUS," SENSOR-BASED TECHNOLOGY CAN HELP USERS DETERMINE THE BEST ROUTE THROUGH CAMPUS — AND TO AN OPEN PARKING SPOT.

A new grant from UNH's Broadband Center of Excellence to an interdisciplinary team of university researchers aims to showcase innovation in broadband technology and data analytics. But perhaps the most compelling outcome of the $75,000 grant is its goal to make parking on campus easier.

Tapping a $1 million grant from the YAS Foundation, the

Broadband Center of Excellence (BCOE), an unbiased resource for information about broadband, requested proposals from UNH researchers in the area of "smart communities," a priority initiative of the Obama Administration.

Smart communities use extensive sensor data linked via wireless broadband connections to inform and improve a wide range of city functions and phenomena, from traffic to air pollution to streetlights. "It basically means connectivity. Your body, your car, your house include sensors that communicate with the cloud so you can be more efficient and save money to manage the world around us," says Rouzbeh Yassini, BCOE founding executive director. "It's nothing more than enabling the environment to talk to you intelligently."

"The idea is to fuse bus data, parking data and pedestrian data, predicting traffic congestion so you can understand an optimal way of moving people through campus."

Parking provides a simple example and is the ideal test-case for a smart community, says Nicholas Kirsch, associate professor of electrical and computer engineering and the principal investigator on the BCOE grant.

"Parking can be complex in urban areas, and even in Durham we have parking challenges. If you had sensors that could tell you where parking was and feed that back to drivers prior to their arrival to campus, that would improve the quality of driving and life," he says.

Kirsch and his collaborators — fellow associate professor of electrical and computer engineering Andrew Kun, and Everett B. Sackett associate professor Bob McGrath and clinical assistant professor Prashant Mittal, both of the department of health

management and policy and UNH's analytics program — will develop and deploy sensor-based technology in a UNH parking lot to "count" the number of empty spaces in that lot.

The team, in particular McGrath and Mittal, will analyze that information, along with data on pedestrian traffic they collect from the busy crosswalk in front of Thompson Hall, to model the best route across campus and into an open parking spot. They plan to make their routing information available via the UNH app.

"You could say, 'I need to be at T Hall at noon, and I'm currently off campus. Where should I park so I can get there on time?'" Kirsch says. "The idea is to fuse bus data, parking data and pedestrian data, predicting traffic congestion so you can understand an optimal way of moving people through campus."

Kun, whose research concerns how people interact with technology and information, will explore displaying this data to users via augmented reality, or AR, technology, like displaying walking or driving directions on Microsoft HoloLens AR glasses.

"He's interested in seeing … if you can deliver the sensor data in interesting ways, convenient ways, safe ways with these glasses," says Kirsch. "This is brand new technology that's never been used in this way before."

While this project may enhance traffic safety and parking ease at UNH, the underlying goal of the grant is to showcase and leverage the university's research capacity in big data and smart communities.

"This is a step toward the bigger dream, to bring more funding to the university," says Yassini, noting that Obama's commitment to smart communities has resulted in greater National Science Foundation funding for such projects.

In addition to the technology, the cross-college collaboration of this project is a win for the team and impressive to future funders.

"There's a great data analytics program on campus, but they need to get data. There are people doing sensors on campus but they need to get their data analyzed," says Kirsch. "This grant provides an opportunity to put into action the sort of collaboration that's kind of hard to do. It brings people across campus from different colleges and disciplines together."
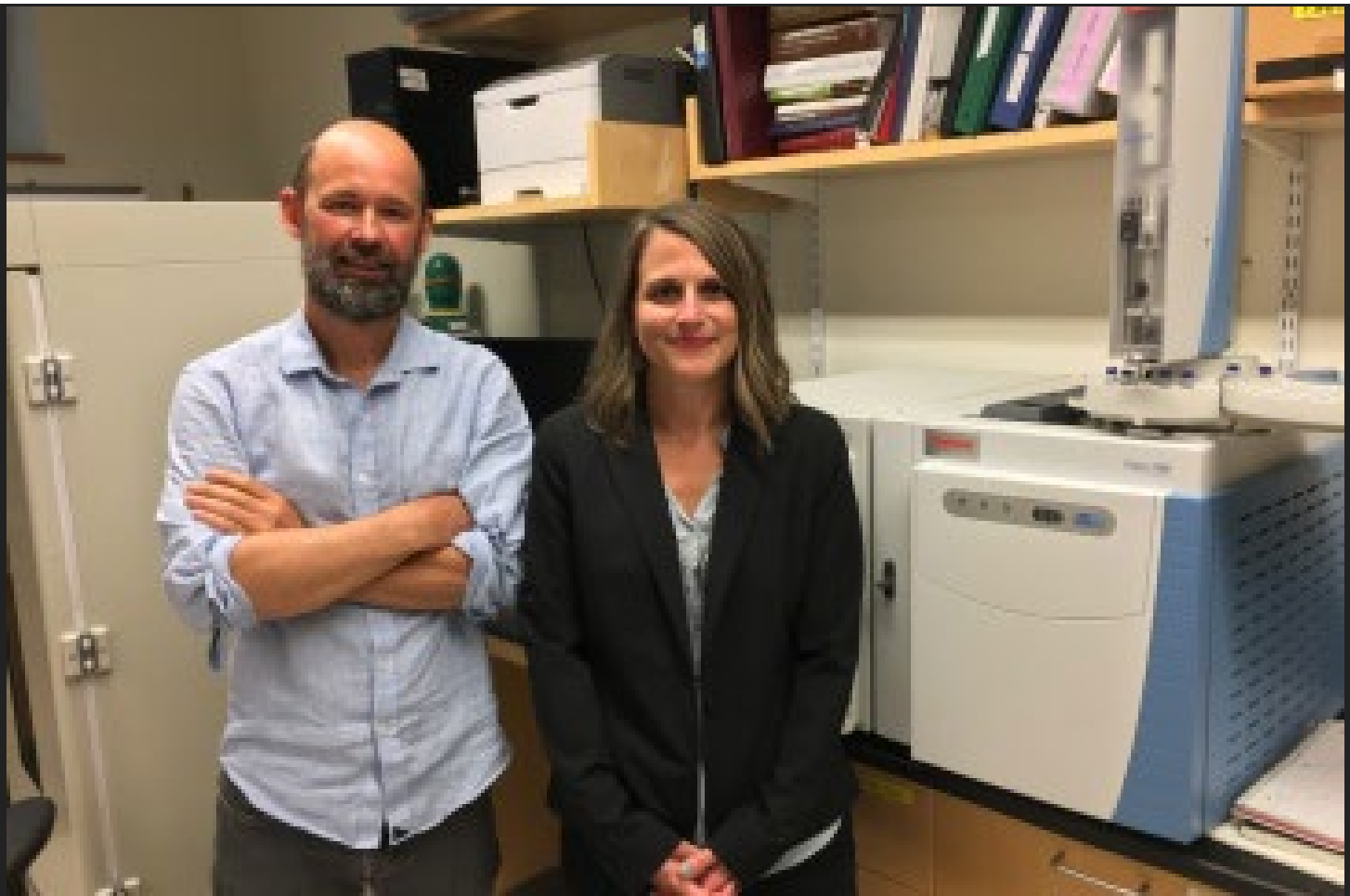
The BCOE will issue a request for proposals for its next round of grant funding in September.

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