Computer scientist drives for comprehensive traffic model

March 28 2012

Traffic and transit information from smart phones, online maps, or radio and TV is not as timely or accurate as it could be, given all the untapped data that could provide a truly dynamic regional traffic picture.

University of Illinois at Chicago assistant professor of computer science Jakob Eriksson hopes he can create a traffic model that gathers together and puts these missing pieces to use. He has received a five-year, $400,000 National Science Foundation Early Faculty Career Award to help make the goal a reality.

"The long-range ambition is to build something like a roadmap, but annotated with everything that's going on at the moment," Eriksson said. "We're basically interested in anything that has to do with your commute."

The UIC computer scientist knows that there are not enough sensor points and sources to get a complete birds-eye view of real-time traffic, but there is information not being fed into traffic reporting systems that, if used, could make the picture more complete. Road sensors, tollway transponders mounted on windshields and "jam cam" traffic cameras could provide pieces to the ever-changing traffic puzzle.

"There are a large number of different kinds of sensors out there," Eriksson said. "This project asks, how do we combine it all into one coherent model showing the current status of the transportation network?"

[Mathematical calculations](#) that could predict alternate routes on side-streets and secondary routes could help motorists bypass traffic jams. A more dynamic, real-time traffic picture could also help commuters decide when it would be more practical to use mass transit.

"It becomes a problem of how you combine all these different kinds of data," Eriksson said, noting the project entails multi-modal traffic sensing. "Do you take the train or drive? What of the many sensory modalities available do we use to really sense what's going on in the streets?"

Initially Eriksson and his students will use Chicago-area data for their study, but they may branch out to other cities that provide different data to tap.

While Eriksson's work will not end [traffic jams](#), it may help make commuting a less taxing experience. But he knows he has taken on a very complicated task.

"There may be 10,000 road segments we want to simulate in some detail with perhaps a million cars on the road during rush hour," he said. "To reflect reality, that's going to require a whole lot of computing power. It's going to take some work to get it right."

Provided by University of Illinois at Chicago