

Microsoft Introduces Tool for Avoiding Traffic Jams

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Microsoft on Thursday plans to introduce a Web-based service for driving directions that incorporates complex software models to help users avoid traffic jams.

The new service's software technology, called Clearflow, was developed over the last five years by a group of artificial-intelligence researchers at the company's Microsoft Research laboratories. It is an ambitious attempt to apply machine-learning techniques to the problem of traffic congestion. The system is intended to reflect the complex traffic interactions that occur as traffic backs up on freeways and spills over onto city streets.

The Clearflow system will be freely available as part of the company's Live.com site (maps.live.com) for 72 cities in the United States. Microsoft says it will give drivers alternative route information that is more accurate and attuned to current traffic patterns on both freeways and side streets.

A system for driving directions that Microsoft introduced last fall was limited, because without Clearflow there was no information available about traffic conditions on city streets adjacent to the highways. Because the system assumed that those routes would be clear, drivers were on occasion sent into areas that were more congested than the freeways.

The new service will on occasion plan routes that might not be intuitive to a driver. For example, in some cases Clearflow will compute that a trip will be faster if a driver stays on a crowded highway, rather than taking a detour, because side streets are even more backed up by cars that have fled the original traffic jam.

The new service is part of Microsoft's efforts to catch up with Google, the dominant search engine provider, by offering an attractive array of related services surrounding its Live search service.

Traffic updates have recently become a standard feature offered by the major Web portals as well as a number of specialized services that send the information to cars or to smartphones and other portable devices.

Greg Sterling, an Internet analyst at Sterling Market Intelligence in San Francisco, said there was consumer demand for traffic information, especially among mobile users. The challenge, he said, will be to demonstrate the improvement the company is claiming.

"This is a sophisticated layer of technology that will not be easily understood by the average person," he said.

The project began in 2003 when Eric Horvitz, an artificial-intelligence researcher at Microsoft, found himself stuck on the freeway while looking for a new restaurant in Seattle. Thinking that he might avoid the traffic jam, he instructed the navigation device in his car to route him via side streets. The result was a nightmare.

"It was awful," he said. "Everything seemed to be backed up."

That set Mr. Horvitz, who is the current president of the Association for the Advancement of Artificial Intelligence, to pondering the problem.

"It hit me that we had to do all the side streets," he said. "We really needed to understand the whole city."

The Microsoft researchers began trying to do just that by building software algorithms that modeled traffic behavior and collecting trip data from Microsoft employees who volunteered to carry G.P.S. units in their cars.

In the end they were able to build a model for predicting traffic based on four years of data and 16,500 discrete trips covering over 125,000 miles. The system effectively created individual "personalities" for over 819,000 road segments in the Seattle region.

After creating the Clearflow simulation for Seattle, the Microsoft researchers were able to transfer the model by using the algorithms they had developed and then applying them to other cities. The city models are combined with live traffic data generated by networks of highway sensors to create about 60 million road segments, allowing the system to predict congestion based on time of day, weather and other variables like sporting events.

"I consider this to be the moon mission of our machine-learning research," Mr. Horvitz said. "I'm still buzzing with the glow that this is actually possible."

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