Hamilton Institute

Towards Autonomous Vehicles in Urban Domains

Dr Michael Quinlan
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Abstract:
This talk will discuss the combination of two current projects: the construction of a fully autonomous car and also a multi-agent system for autonomous intersection management (AIM).

The DARPA Urban Challenge (http://www.darpa.mil/grandchallenge/)requires an autonomous vehicle to successfully perform missions inside a urban terrain. The robot is required to perform tasks such as navigate intersections, merging in to moving traffic, overtaking and other activities that it may face in an suburban environment. 83 teams originally competed in the competition, with Carnegie Mellon taking home the first prize of $2 million US. The team from Austin finished in the top 20 and the beginning of this talk will discuss the challenge itself as well as the many hardware and software aspects of the system required to compete.

The AIM project (http://www.cs.utexas.edu/~kdresner/aim/) plans to create a scalable, safe, and efficient multiagent framework for managing autonomous vehicles at intersections. At modern-day intersections,traffic lights and stop signs assist human drivers in conducting their vehicles safely through the cross traffic. With all the advantages computerized drivers offer - more precise control, better sensors, and quicker reaction times, this project develops Vehicle-to-Intersection(V2I) and Vehicle-to-Vehicle (V2V) communications that will not only make automobile travel safer and easier, but much more efficient.

We have now reached the point in the project where we can leave the purely simulated environment and try the framework with real vehicles.This talk will now discuss some of the new issues faced after moving from simulation, in particular we discuss the 'mixed reality' approach we are taking to safely test on our autonomous car.

Bio:
Dr Michael Quinlan completed his PhD entitled 'Machine Learning on Aibo Robots' in 2006 from the University of Newcastle, Australia. Since July 2007, he has been a postdoctoral researcher in the Learning Agents research group at the University of Texas, Austin. He has been a team leader for several years of the NUbots, including 2006 when they achieved first place in the RoboCup Soccer Four Legged League. He has a range of research interests relating to applications of Machine Learning, Support Vector Machines, and Boosting in robots and autonomous vehicles.

Venue: Seminar Room, Hamilton Institute, Rye Hall,
           NUI Maynooth

Time: 2.00 - 3.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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