

# Special Issue on Vision Applications and Technology for Intelligent Vehicles: Part II—Vehicles

**T**HIS is the second part of a special issue on sensing technology in Intelligent Transportation Systems (ITS). The special issue contains revised papers originally presented at the 1999 IEEE/IEEJ/JSAI International Conference on Intelligent Transportation Systems. The first part (IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, Vol. 1, No. 2, June 2000) presented papers focused on the infrastructure, including flow measurement for intelligent route guidance and event recognition for accident warning. This second part concentrates on sensing capabilities of vehicles.

Ma *et al.* describe a method to simultaneously detect lane and pavement boundaries using model-based sensor fusion. This technique is important for autonomous driving. Zhao and Thorpe as well as Curio *et al.* describe methods to recognize pedestrians. This is an important issue for the prevention of accidents involving pedestrians. This part of the special issue

concludes with a paper by Broggi *et al.*, who develop a method to detect obstacles and vehicles for platooning. We hope that you will enjoy this second and final part of the special issue.

ALBERTO BROGGI, *Guest Editor*  
Dipartimento di Informatica e Sistemistica  
Universita di Pavia  
Via Ferrata 1  
I-27100 Pavia, Italy

KATSUSHI IKEUCHI, *Guest Editor*  
Institute of Industrial Science  
University of Tokyo  
7-22-1-Roppongi Minato-ku  
Tokyo, 106-8558 Japan

CHARLES E. THORPE, *Guest Editor*  
The Robotics Institute  
Carnegie Mellon University  
Pittsburgh, PA 15213 USA

Manuscript received September 11, 2000; revised October 5, 2000.  
Publisher Item Identifier S 1524-9050(00)10922-6.



**Alberto Broggi** (S'90–A'96–M'00) received the Dr.Eng. (Master) degree in electronic engineering and the Ph.D. degree in information technology from the Università di Parma, Parma, Italy, in 1990 and 1994, respectively.

From 1994 to 1998, he was Full Researcher at the Dipartimento di Ingegneria dell'Informazione, Università di Parma. Since 1998, he has been Associate Professor of Artificial Intelligence at the Dipartimento di Informatica e Sistemistica, Università di Pavia, Pavia, Italy. His research interests include real-time computer vision approaches for the navigation of unmanned vehicles, and the development of low-cost computer systems to be used on autonomous agents. He is the coordinator of the ARGO Project, with the aim of designing, developing, and testing the ARGO autonomous prototype vehicle, equipped with special active safety features and enhanced driving capabilities. He is the author of more than 100 refereed publications in international journals, book chapters, and conference proceedings. Actively involved in the organization of scientific events, he is on the Editorial Board and Program

Committee of many international journals and conferences and has been invited to act as Guest Editor of journals and magazines theme issues on topics related to intelligent vehicles, computer vision application, and computer architectures for real-time image processing.

Prof. Broggi is the Newsletter Editor and Member of the Conference and Publication Committees of the IEEE Intelligent Transportation Systems Council and is the Program Chair of the IEEE Intelligent Vehicles Symposium, Detroit, 2000.



**Katsushi Ikeuchi** (M'78–SM'95–F'98) received the B.Eng. degree in mechanical engineering from Kyoto University, Kyoto, Japan, in 1973, and the Ph.D. degree in information engineering from the University of Tokyo, Japan, in 1978.

After working at the Artificial Intelligence Laboratory at Massachusetts Institute of Technology, Cambridge, the Electrotechnical Laboratory of the Ministry of International Trade and Industries, and the School of Computer Science, Carnegie Mellon University, Pittsburgh, PA, he joined the University of Tokyo, in 1996, where he is now a Professor at the Institute of Industrial Science.

Dr. Ikeuchi received various research awards, including the David Marr Prize in computational vision in 1990 and the IEEE R&A K-S Fu Memorial Best Transactions Paper Award in 1998. In addition, in 1992, his paper, "Numerical Shape from Shading and Occluding Boundaries," was selected as one of the most influential papers to have appeared in the *Artificial Intelligence Journal* within the past ten years.



**Charles E. Thorpe** (M'87–SM'93) received the undergraduate degree in natural science from North Park College, Chicago, IL, in 1979, and the Ph.D. degree in computer science from Carnegie Mellon University (CMU), Pittsburgh, PA, in 1984.

He is a Principal Research Scientist at CMU. During the 2000–2001 academic year, he is Acting Director of the Robotic Institute. He founded and directs the Master's Degree program in Robotics at CMU. His interests are in computer vision, planning, and architectures for outdoor robot vehicles. Since 1984, his Navlab group has built a series of ten robot cars, HMMWVs, minivans, and full-sized passenger buses, for military and civilian research. The Navlab group has pioneered new methods in stereo vision, laser rangefinding, three-dimensional terrain modeling, neural nets for perception, route planning, driver performance modeling, traffic simulation, teleoperation, vehicle control on rough terrain, and system architectures. He has also been involved with automated helicopters, walking robots, and underwater robots.

Dr. Thorpe is a Fellow of the American Association for Artificial Intelligence.