

Guest Editorial

We are pleased to introduce this collection of papers covering different aspects of intelligent transportation systems. These papers were selected from a list of papers presented at the Intelligent Transportation Systems Conference and Intelligent Vehicles Symposium, jointly held in Detroit, MI, October 3–5, 2000.

In order to bear witness and celebrate the large success of these two scientific meetings, that for the first time were held in the same year and same place, the two Program Chairs, Prof. Petros A. Ioannou and Prof. Alberto Broggi, in collaboration with the Editor of the Transactions on Intelligent Transportation Systems, Chelsea White III, considered the publication of a special issue that would include a number of selected papers that were presented at these conferences.

Profs. Alberto Broggi, Petros A. Ioannou, and Shoichi Washino agreed to serve as Guest Editors of this special issue. The first two Guest Editors made the initial selection of six papers from each conference based on the area and rating of the paper during the conference review process. The third Guest Editor handled the papers that were posing a conflict of interest, or were outside the area of expertise of the other Guest Editors.

The authors of the selected papers were asked to revise their papers and submit them for the special issue. The Guest Editors sent out the submitted papers for review by following the usual procedure of the journal. Based on the reviews, the Guest Editors made their final recommendation. The papers with positive reviews that required minor revisions were accepted for the special issue without having to go through another round of reviews. The rest were either rejected or recommended for extended revisions and resubmission to the journal as regular submissions. The five accepted papers covered topics from three different areas of transportation that includes air, surface, and marine and are described as follows.

- 1) “Conflict Resolution Problems for Air Traffic Management Systems Solved with Mixed Integer Programming” by Lucia Pallottino, Eric Feron, and Antonio Bicchi.

This paper is selected based on good reviews and also for covering a topic in air transportation, an important area that has begun to attract more attention in research. With the air space getting more congested the number of conflicts and near misses is increasing. This paper proposes two different formulations of the multi-aircraft conflict avoidance problem using mixed-integer linear programming so that standard optimization software tools could be used to resolve conflicts and manage air traffic.

- 2) “Quintic G^2 -splines for the Iterative Steering of Vision-based Autonomous Vehicles” by Aurelio

Piazzini, Corrado Guarino Lo Bianco, Massimo Bertozzi, Alessandra Fascioli, and Alberto Broggi.

Motion planning is an important problem that arises in robotics, automated vehicles, and many other applications. This paper proposes a new motion-planning primitive that could be used for steering of vision-based autonomous vehicles.

- 3) “Detection and Classification of Vehicles” by Surendra Gupte, Osama Masoud, and Nikolaos Papanikolopoulos.

The detection and classification of vehicles in a traffic environment is an important problem in traffic management, incident detection, safety, etc. This paper presents algorithms for vision-based detection and classification of vehicles by processing raw images obtained by a stationary camera in real time.

- 4) “EMS-Vision: A Perceptual System for Autonomous Vehicles” by R. Gregor, M. Lutzeler, M. Pellkofer, K.-H. Siedersberger, and E. D. Dickmanns.

This paper deals with an intelligent vehicle with a new vision system that can drive very safely on roads covered with heavy snow. A new recognition system, a decision system, and a vehicle control system are mounted on the intelligent vehicle.

- 5) “Design, Simulation, and Evaluation of Automated Container Terminals” by Chin-I Liu, Hossein Jula, and Petros A. Ioannou.

Four concepts that have potential for increasing the efficiency of the future container terminals are designed, analyzed, simulated, and evaluated. Also, a scenario moving from present container terminals to the future ones is proposed. From the point of view of technologies and practice this paper is both informative and suggestive.

We would like to thank the Editor-in-Chief of this journal, Chelsea C. White, III, for the possibility to organize this special issue, and would like to extend our gratitude to his Editorial Assistant, Jerri L. White, for her outstanding help in the management of the papers.

ALBERTO BROGGI, *Guest Editor*
 Università di Parma
 Dipartimento di Ingegneria dell'Informazione
 Parco Area delle Scienze
 Parma, 43100, Italy

PETROS A. IOANNOU, *Guest Editor*
 University of Southern California
 Electrical Engineering Department
 Los Angeles, 90089, CA USA

SHOICHI WASHINO, *Guest Editor*
 Tottori University
 Department of Environmental Studies
 Tottori, 680-8550, Japan



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

From 1994 to 1998, he was a Full Researcher at the Dipartimento di Ingegneria dell'Informazione, Università di Parma. From 1998 to 2001, he was an Associate Professor of artificial intelligence at the Dipartimento di Informatica e Sistemistica, Università di Pavia, Pavia, Italy, and since 2001, he has been a Professor of computer science at the same university. 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 120 refereed publications in international journals, book chapters, and conference proceedings. He is actively involved in the organization of scientific events, and 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. 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.



Petros A. Ioannou (S'80–M'83–SM'89–F'94) received the B.Sc. degree with First Class Honors from University College, London, U.K., in 1978 and the M.S. and Ph.D. degrees from the University of Illinois, Urbana, in 1980 and 1982, respectively.

From 1979 to 1982, he was a Research Assistant at the Coordinated Science Laboratory at the University of Illinois. In 1982, he joined the Department of Electrical Engineering-Systems, University of Southern California, Los Angeles. In fall 1988, he was a Visiting Professor at the University of Newcastle, Newcastle, Australia, and in summer 1992, the Technical University of Crete. He served as the Dean of the School of Pure and Applied Science at the University of Cyprus, in 1995. Currently, he is a Professor in the Department of Electrical Engineering-Systems, University of Southern California and the Director of the Center of Advanced Transportation Technologies. He was the author and coauthor of five books and over 150 research papers in the area of controls, neural networks, nonlinear dynamical systems and intelligent transportation systems. His research interests are in the areas of adaptive control, neural networks, nonlinear

systems, vehicle dynamics and control, intelligent transportation systems, and marine transportation.

Dr. Ioannou held a Commonwealth Scholarship from the Association of Commonwealth Universities, London, U.K., from 1975 to 1978. He was awarded several prizes, including the Goldsmid Prize and the A. P. Head Prize from University College. In 1984, he was a recipient of the Outstanding Transactions Paper Award for his paper, "An Asymptotic Error Analysis of Identifiers and Adaptive Observers in the Presence of Parasitics," which appeared in the IEEE TRANSACTIONS ON AUTOMATIC CONTROL, in August 1982. He is also the recipient of a 1985 Presidential Young Investigator Award for his research in Adaptive Control. He has been an Associate Editor for the IEEE TRANSACTIONS ON AUTOMATIC CONTROL and the *International Journal of Control and Automatica*. Currently, he is an Associate Editor of the IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS and an Associate Editor at Large of the IEEE TRANSACTIONS ON AUTOMATIC CONTROL. He is a member of the Control System Society's Council Committee on IEEE Intelligent Transportation Systems and Vice-Chairman of the International Federation on Automatic Control (IFAC) Technical Committee on Transportation Systems.



Shoichi Washino was born in Osaka, Japan, in 1945. He received the Ph.D. degree in electronic engineering from Osaka University, Osaka, Japan.

In 1975, he joined Mitsubishi Electric Corporation. Since 2001, he has been a Professor in the Environmental Studies Department at Tottori University, Tottori, Japan. His technical fields vary from electron physics and control technology to combustion technology. His current technical interest is in developing intelligent transportation systems.

Dr. Washino is an Associate Editor of the IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS.