

Acknowledgments

Many people contributed to the Proceedings of the symposium members either by giving suggestions. Some of them are listed below.

Intelligent Vehicles '92

Symposium

June 29 - July 1, 1992

Detroit

Sponsored by
IEEE Industrial Electronics Society

Co-sponsored by
SAE
SAE - Japan
Dynamic Systems and Control Division of ASME
IEEE Vehicular Technology Society
IEEE Neural Nets Council
SICE
RSJ
SOFT

Proceedings of the

.....
.....

Intelligent Vehicles '92

Symposium

.....
.....

June 29 - July 1, 1992

Detroit

Copyright and Reprint Permission: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Instructors are permitted to photocopy isolated articles for non-commercial classroom use without fee. For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. All rights reserved. Copyright 1990 by the Institute of Electrical and Electronics Engineers, Inc.

IEEE Catalog Number 92TH0468-9
ISBN 0-7803-0747-X (softbound)
ISBN 0-7803-0748-8 (microfiche)
Library of Congress Number 92-54401

Acknowledgments

Many people contributed to this symposium by serving as organizing committee members and/or by giving suggestions. Some of them are listed here in alphabetic order.

S. Amari (U of Tokyo)	C. Laugier (LIFIA)
M. Bell (U of Nottingham)	D.T. Lawton (Georgia IT)
C. de Benito (Ford)	R.N. Lee (NASA)
J.C. Bezdek (U W Florida)	P.A. Ligomenides (U of Maryland)
B. Bosacchi (ATT Bell Lab)	G. Lindstrom (Honda)
D.E. Boyse (U of Illinois)	H.S. Mahmassani (U of Texas)
J.M. Brady (Oxford)	K.A. Marko (ford)
D. Brand (CRA)	B. Mathur (Rockwell)
P. J. Burt (Sarnoff)	W. Mellis (Daimler-Benz)
D.L. Christiansen (Texas Trans Inst)	P. Michalopoulos (U of Minnesota)
L.S. Davis (U of Maryland)	H. Okamoto (Japan Traffic Management)
P. Davies (Castle Rock)	C.K. Orski (Urban Mobility)
E.D. Dickmanns (U D B München)	M.J. Patyra (CMU)
G.G. Dodd (GM)	T. Poggio (MIT)
C.L. Dudek (Texas A&M)	W.B. Powell (Princeton)
L.A. Feldkamp (Ford)	W.W. Recker (UC Irvine)
T. Fukuda (U of Nagoya)	W. Remmele (Siemens)
W.J. Gillan (UK DOT)	E. Riseman (U of Massachusetts)
V. Graefe (U D B München)	S.G. Ritchie (UC Irvine)
J.A. Greenberg (Ford)	E.H. Ruspini (SRI)
F. Harashima (U of Tokyo)	M.de Saint Blancard (Peugeot)
G. Hartmann (U Paderborn)	I. Sakai (Honda)
H. Hashimoto (U of Tokyo)	P. Schonfeld (U of Maryland)
K. Hashimoto (Honda)	Y. Shirai (Osaka U)
B. Heydecker (U College London)	M. Shulman (Ford)
A. Hosaka (Nissan)	K.C. Sinha (CUTC)
T. Hrycej (Daimler-Benz)	W.M. Spreitzer (GM)
T. Inoue (Toyota)	M. Sugeno (TIT)
R. Jain (U of Michigan)	A. Takanishi (Waseda U)
D.C. Judycki (US DOT)	C. Thorpe (CMU)
T. Kanade (CMU)	M. Togai (Togai IL)
A. Kanafani (UC Berkeley)	S. Tsugawa (MITI)
J.L. Kay (JHK)	S. Tsuji (Osaka U)
D. Keirse (Hughes)	P. Werbos (NSF)
A. Kemeny (Renault)	B.S. Widmann (Hughes)
C. Koch (Cal Tech)	J. L. Wyatt, Jr. (MIT)
M. Koshi (U of Tokyo)	M. Yoshida (Fujitsu)
S.Y. Kang (Princeton)	S. Yuta (Tsukuba U)
T.N. Lam (U of Hong Kong)	L.A. Zadeh (UC Berkeley)
J-C Latombe (Stanford)	

I would like to express my appreciation to all of them who contributed to this symposium.

Ichiro Masaki, General Chair, (GM)

MAR 30 1995



Program

Monday, June 29

Session 1 (9:10am - 10:30am)

Chairpersons: V. Graefe (U. der Bundeswehr München)

Traffic Sign Recognition in Color Image Sequences
W. Ritter (Daimler Benz) 12

A Hierarchical Vision System
G. Hartmann, B. Mertsching (U. Paderborn) 18

Vision-Based Car-Following: Detection, Tracking, and Identification
M. Schwarzingler, T. Zielke, D. Noll, M. Brauckmann, W. v. Seelen (R-U. Bochum) 24

A Structure-from-motion Algorithm for Robot Vehicle Guidance
H. Wang, M. Brady (Oxford U.) 30

Session 2 (10:50am - 12:10pm)

Chairpersons: J. L. Wyatt, Jr (MIT)

VITA - An Autonomous Road Vehicle (ARV) for Collision Avoidance in Traffic
B. Ulmer (Daimler-Benz) 42

Obstacle Detection Using Bi-Spectrum CCD Camera and Image Processing
H. G. Nguyen, J. Y. Laisne (Renault) 36

Disparity Analysis for Real Time Obstacle Detection by Linear StereoVision
J. -L. Bruyelle, J. -G. Postaire (CAL) 51

Automatic Recognition of Vehicles Approaching from Behind
W. Efenberger, Q. -H. Ta, L. Tsinas, V. Graefe (U. der Bundeswehr München) 57

Lunch (12:10pm - 1:10pm)

Special invited Session (1:10pm - 2:10pm)

Speaker: R. A. Frosch (Vice President, GM) 11
Chairperson: G. G. Dodd (GM)

Session 3 (2:10pm - 3:30pm)

Chairpersons: R. Jain (U of Michigan)

A High Performance Modular Architecture for Hardware Implementation of Neural
and Digital Applications
Y-S. Chiou, P. A. Ligomenides (U. Maryland, Caelum Res. Corp) 63

Small, Fast Analog VLSI Systems for Early Vision Processing J. L. Wyatt, Jr., C. Keast, M. Seidel, D. Standley, B. Horn, T. Knight, C. Sodini, H-S Lee (MIT)	69
Object-Based Analog VLSI Vision Circuits C. Koch (CalTech); B. Mathur, S.-C. Liu (Rockwell International Science Center); J. G. Harris (MIT); J. Luo, M. Sivilotti (Tanner Research)	74
Collision-Avoidance System Based on Optical Flow N. Hatsopoulos, J. A. Anderson (Artemis Associates, Brown U.)	79
Session 4 (3:50pm - 5:30pm)	
Chairpersons: L. A. Feldkamp (Ford) M. Togai (Togai InfraLogic)	
Lateral Control of a Autonomous Road Vehicle in a Simulated Highway Environment Using Adaptive Resonance Neural Networks J. M. Lubin, E. C. Huber, S. Gilbert, A. L. Kornhauser (Princeton U)	85
Fuzzy Control for Active Suspension Design E. C. Yeh, Y. J. Tsao (National Tsing Hua U)	92
Adaptive Traffic Signal Control Using Fuzzy Logic S. Chiu (Rockwell)	98
Estimating Ignition Timing from Engine Cylinder Pressure with Neural Networks B. Willson, C. Anderson, J. Whitham (Colorado State U)	108
Representation and Recovery of Road Geometry in YARF K. Kluge, C. Thorpe (Carnegie Mellon U)	114

Tuesday, June 30

Session 5 (9:00am - 10:40am)

Chairpersons: K. A. Marko (Ford) B. Ulmer (Daimler-Benz)	
Design Method for an Automotive Laser Radar System and Future Prospects for Laser Radar M. Sekine, T. Senoo, I. Morita (Nissan); H. Endo(Kansei Co.)	120
Vision for Vehicle Guidance Using Two Road Cues G. Funka-Lea, R. Bajcsy (U of Pennsylvania)	126
Super Smart Vehicle System: AVCS Related Systems for the Future S. Tsugawa (MITI); T. Saito (Toyota); A. Hosaka (Nissan)	132
A Simulation Based Methodology for Analyzing Network-Based Intelligent Vehicle Control Systems N. Boustany, M. Folkerts, K. Rao, A. Ray, L. Troxel, Z. Zhang (GM)	138
Impact of Automatic and Semi-Automatic Vehicle Longitudinal Control on Motorway Traffic F. Broqua (Renault)	144

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.