Special Section on Real-Time Imaging

Phillip Laplante
Burlington County College/
New Jersey Institute of Technology
Technology and Engineering Center
Mt. Laurel, New Jersey 08608
E-mail: laplante@njit.edu

Divyendu Sinha
CUNY/College of Staten Island
Computer Science Department
2800 Victory Boulevard
Staten Island, New York 10314-6609
E-mail: dsinha@csiunx.it.csi.cuny.edu

Alexander D. Stoyenko
New Jersey Institute of Technology
Department of Computer and Information Science
Real-Time Computing Laboratory
University Heights
Newark, New Jersey 07102-1982
E-mail: alex@vienna.njit.edu

Real-time image processing is any image processing where timeliness is as critical as accuracy. Included in this domain are real-time image compression, target acquisition and tracking, remote control and sensing, image enhancement and filtering, networking for real-time imaging, advanced computer architectures, computer vision, optical measurement and inspection, and simulation.

There has been growing interest in real-time imaging as a separate discipline of imaging science. Over the past several years there have been several sessions on the subject at various conferences, two books jointly published by SPIE and IEEE, and numerous journal and magazine articles. There is now even an entire journal devoted to the subject, *Real-Time Imaging*.

We proposed and organized the First IS&T/SPIE Conference on Real-Time Imaging in San Jose, California, in January 1996 in response to this interest. The conference was intended to bring together researchers, technolo-gists, and practitioners in fundamental real-time imaging technologies and their application areas. The conference was also intended to provide a mechanism for researchers to keep abreast of new applications and industrial needs, and for practitioners to learn of new available technologies. Emphasis was placed on the application of real-time imaging in the following technologies; robotics, virtual reality, multimedia, medical imaging, industrial inspection, high-definition television, advanced simulators, computer-integrated manufacturing, and intelligent vehicles.

As a followup to the conference, several of the presenters were invited to submit revised, expanded journal-length papers for peer review and possible inclusion in a special section in the *Journal of Electronic Imaging*. This special section represents the result of those efforts. The papers in this special section include ''Real-time inspection by submarine images'' by Guido Tascini, Primo Zingaretti, and Giuseppe Conte; ''Comparative study of skew de-tection algorithms'' by Adnan Amin, Stephen Fischer, Tony Parkinson, and Ricky Shiu; ''Real-time pedestrian counting by active linear cameras'' by Louahdi Khoudour, Luc Duvieubourg, and Jean-Pierre Deparis; and ''Adaptive scaled mean square error filtering by neural networks'' by Ling Guan, Stuart W. Perry, and Edwin P. K. Wong.

In addition to those papers, an additional submitted paper by Purnendu Sinha *et al.* is included that provides a classification scheme and overview of research in real-time imaging. We hope that this paper helps to put the others into context.

We would like to the thank all the authors and reviewers for making this special section a success. We enjoyed organizing this special section and working with the outstanding scientists and engineers that made it a success. We hope you find this special section to be valuable reference material for your own research and applications.

Phillip Laplante is the dean of the Burlington County College/New Jersey Institute of Technology Technology and Engineering Center in Mount Laurel, New Jersey. This unique dual college campus delivers associate, bachelor, and master degree programs in science and engineering. Prior to that, he was the chair of the Department of Computer Science and Mathematics at Fairleigh Dickinson University. He also spent seven years in industry designing high-reliability avionics software and support software. He continues to consult to industry on real-time systems and real-time image processing. Laplante has authored numerous technical papers and eight books on computer science. His research areas are in software engineering, real-time processing, image processing, and real-time image processing and he is a founding coeditor-in-chief of the journal *Real-Time Systems*. He is a licensed professional engineer in New Jersey.

Divyendu Sinha obtained his Btech (Honors) in computer science and engineering from the Indian Institute of Technology, and his MS and PhD degrees in computer science from the Stevens Institute of Technology. From 1987 to 1989 he served on the faculty of the Electrical Engineering and Computer Science Department at the Stevens Institute of Technology. Since 1990 he has been with the College of Staten Island and the Graduate Center of the City University of New York. He is currently on sabatical leave and working in a company that supplies a variety of manual and automated flip-chip bonding equipment for the semiconductor industry. Dr. Sinha is an associate editor of the *Journal of Electronic Imaging* and the *Journal of Real-time Imaging*. He was cochairman of the 1994 and 1995 SPIE Conferences on Real-time Imaging held in San Jose, California. His research interests include the fundamentals of fuzzy set theory and mathematical morphology. Dr. Sinha has consulted extensively in the areas of machine vision and object-oriented programming.

Alexander D. Stoyenko received a doctorate in computer science from the University of Toronto in 1987. Subsequently, he joined IBM T. J. Watson Research Center as a research staff member. Since 1990, he has been on faculty with the Department of Computer and Information Science at the New Jersey Institute of Technology, where he founded and leads the Real-Time Computing Laboratory and is currently an associate professor. Dr. Stoyenko is also the president and CEO of 21st Century Systems, Inc. He has held visiting and consulting appointments at the University of Twente, IBM Zurich Research Laboratory, Fern Universitat Hagen, Honeywell Space & Missile Systems, Technical University of Eindhoven, Stanford University, City University of Hong-Kong, Wang Institute of Graduate Studies, the University of Toronto, and the Bank of Montreal. His research interests are in real-time computing, distributed and parallel computing, engineering of complex computer systems, programming languages, compilers and tools, real-time imaging, biomedical computing, and software reuse and integration. He has pioneered the notions of schedulability analysis and schedulability analyzable programming languages. Dr. Stoyenko has published in more than 100 books, refereed journals, and conferences, including a coauthored book *Constructing Predictable Real-Time Systems*. He has served as a chair for several conferences and workshops. He is a senior member of IEEE. Dr. Stoyenko's professional activities have been supported by a number of grants from government and industry.