Program

08h30 Welcome Message, Ahmed Nabil Belbachir, General Chair

S1: Keynote Talk (08h35 – 09h20)

Keynote: Trends, Challenges and Opportunities in Embedded Vision
Jeff Bier (President of BDTI and founder of the Embedded Vision Alliance)
Chair: Ahmed Nabil Belbachir (AIT Austrian Institute of Technology)

Thanks to powerful, energy efficient and inexpensive processors and sensors, computer vision can now be implemented in a wide array of cost-sensitive applications that were impractical just a few years ago. As a result, embedded vision is rapidly proliferating, and is poised to become a ubiquitous technology that enhances peoples’ lives every day. In this presentation we will examine the trends that are enabling embedded vision, with particular attention to developments in processors. We will also highlight some of the major commercial opportunities for embedded vision, and we will explore key challenges that must be addressed for embedded vision to reach its full potential.

S2: Smart Cameras (0920–1000)

Chair: Sek Chai (SRI International Sarnoff)

09h20 Single-view obstacle detection for smart back-up camera systems, Jeff Lalonde, Robert Laganière, Luc Martel

09h40 High-Speed Line-Scan Camera with Multi-Line CMOS Color Sensor, Ernst Bodenstorfer, Ylber Hasani, Johannes Fürtler, Jörg Brodersen, Konrad Mayer

10h00 Morning Break

S3: Reconfigurable Computing for Computer Vision (10h30–11h10)

Chair: Boaz Super (Motorola Solutions)

10h30 Stereo Vision Embedded System for Augmented Reality, Eduardo Gudis, Gooitzen van der Wal, Sujit Kuthirummal, Sek Chai, Supun Samarasekera, Rakesh Kumar, Vlad Branzoi

10h50 Feature detection and matching on an SIMD/MIMD hybrid embedded processor, Alejandro Nieto, David López Vilarro, Jörg Brodersen, Konrad Mayer

11h10 Lunch Break

S4: Detecting and Tracking Humans (1110–1230)

Chair: Fridtjof Stein (Daimler)

11h10 Head-tracking virtual 3-D display for mobile devices, Miguel Bordallo López, Jari Hannukseit, Olli Silvén, Lixin Fan

11h30 Spatiotemporal Multiple Persons Tracking Using Dynamic Vision Sensor, Ewa Piatkowska, Ahmed Nabil Belbachir, Stephanie Schramli, Margrit Gelautz

11h50 SURF Cascade Face Detection Acceleration on Sandy Bridge Processor, Eric Li, Liu Yang, Bin Wang, Jianguo Li, Ya-tie Peng

12h10 Real-time Body Motion Analysis for Dance Pattern Recognition, Bernhard Kohn, Aneta Nowakowska, Ahmed Nabil Belbachir

12h30 Lunch Break

S5: Embedded Vision for Safety and Security (1330–1445)

Chair: Margrit Gelautz (Vienna University of Technology)

13h30 Embedded Smart Sensor for Outdoor Parking Lot Lighting Control, Zhong Zhang, Amit Mistry, Weihong Yin, Peter Venetianer

13h50 Embedded Fall Detection with a Neural Network and Bio-Inspired Stereo Vision, Martin Humenberger, Stephan Schramli, Christoph Sulzbachner, Ahmed Nabil Belbachir, Agoston Srp, Ferenc Vajda

S6: Poster Session: Technologies and Applications (1410–1500)

Chair: Andrew Hunter (University of Lincoln)

- A GPU Accelerated Fast Directional Chamfer Matching Algorithm and a Detailed Comparison with a Highly Optimized CPU Implementation, Michael Rauter, David Schreiber

- Event-driven Embedded System for Feature Extraction and Object Recognition in Robotic Applications, Georg Wiesmann, Stephan Schramli, Martin Litzenberger, Ahmed Nabil Belbachir, Chiara Bartolozzi, Michael Hofstätter

- A CPU-GPU Hybrid People Counting System for Real-World Airport Scenarios using Arbitrary Oblique View Cameras, David Schreiber, Michael Rauter

15h00 Afternoon Break

S7: Invited Talks 1: Vision Technology and Programs (1530–1640)

Chair: Andrew Hunter (University of Lincoln)

15h30 Vision Processing in Extreme Low Light and High Motion Environments, Sek Chai (SRI)

16h05 DARPA's Mind's Eye Program: The Way Ahead for Visual Intelligence, James Donlon (DARPA)

S8: Invited Talks 2: Automotive Safety and Challenges (1640–1750)

Chair: Branislav Kisačanin (Texas Instruments)

16h40 Embedded Computer Vision for Safety and Security: an FPGA-based Perspective, Vittorio Murino (Italian Institute of Technology)

17h15 The Challenge of Putting Vision Algorithms into a Car, Fridtjof Stein (Daimler)

17h50 Paper Award & Closing Remarks

ECV

The Best Paper Award for EVW 2012 is sponsored by: The Embedded Computer Vision project, which is under the COMET program of the Austrian Research Promotion Agency (FFG).
Keynote Speaker

Jeff Bier is founder of the Embedded Vision Alliance (www.Embedded-Vision.com). The Embedded Vision Alliance is an industry partnership formed to enable the market for embedded vision technology by inspiring and empowering design engineers to create more capable and responsive products through integration of vision capabilities. The Alliance provides training videos, tutorial articles, code examples, and an array of other resources (all free of charge) on its web site, www.Embedded-Vision.com. Jeff is also a co-founder and president of Berkeley Design Technology, Inc. (www.BDTI.com), a trusted resource for independent analysis and specialized engineering services in the realm of embedded digital signal processing applications. Jeff oversees BDTI’s benchmarking and analysis of chips, tools, and other technology. Jeff is also a key contributor to BDTI’s consulting services, which focus on product-development, marketing, and strategic advice for companies using and developing embedded audio, video, wireless and vision technologies.

Invited Speakers

James J. Donlon is a Program Manager at the Defense Advanced Research Projects Agency (DARPA) in Arlington, VA. He is the program manager for the “Mind’s Eye” program, which is focused on achieving new capabilities in activity recognition for ground-level, full-motion video. The Mind’s Eye initiative has led to the active new multidisciplinary field of ‘visual intelligence’. Mr. Donlon is also program manager for DARPA’s “Computer Science Study Group” program. Through this program, DARPA supports 72 computer science professors in applying their research projects to the needs of national defense. Through this program Mr. Donlon introduces these academic researchers to dozens of military and intelligence organizations, leading to collaborative applied research aimed at solving contemporary defense challenges. Mr. Donlon’s other DARPA research programs include “Software Productivity” and “Application Communities”. Prior to joining DARPA, Jim was an active-duty Army officer, retiring as a Lieutenant Colonel in 2008. His previous positions include Director of the Knowledge Engineering Group at the U.S. Army Center for Strategic Leadership; Chief of Technical Support and Operations Officer of the Korea Battle Simulation Center in Seoul, Korea; and most recently as Executive Officer of ICTM in NATO Headquarters in Brussels, Belgium.

Fridtjof Stein received a Diploma degree in Computer Science from the Karlsruhe Technical University in 1988, and a PhD from the University of Southern California in 1992. Since 1992, he has been a Senior Research Scientist at the Daimler Research Group in Boeblingen, Germany. From 1992 to 1994 he was responsible for the software integration at the EU Commission’s Prometheus project, where for the first time autonomous driving in public traffic based on computer vision was demonstrated. Since then Mr. Stein is working on several vision related projects at Daimler with the focus on embedded systems. His research interests include real-time vision, especially in the fields of stereo vision, optical flow, object detection, and ground modeling in the automotive domain.

Vittorio Murino is full professor at the University of Verona, Italy, and director of the PAVIS (Pattern Analysis and Computer Vision) department at the Istituto Italiano di Tecnologia. He took the Laurea degree in Electronic Engineering in 1989 and the Ph.D. in Electronic Engineering and Computer Science in 1993 at the University of Genova, Italy. He held a post-doctoral position from 1993 to 1995, working in the Signal Processing and Understanding Group of the Dept. of Biophysical and Electronic Engineering of the University of Genova as supervisor of research activities on image processing for object recognition and pattern classification in underwater environments. From 1995 to 1998, he was assistant professor at the Dept. of Mathematics and Computer Science of the University of Udine, Italy, and since 1998 he works at the University of Verona. He was chairman of the Department of Computer Science from 2001, year of foundation, to 2007. Prof. Murino is scientific responsible of several national and European projects and evaluator of EU project proposals related to several frameworks and programs. Currently, he is working at the Istituto Italiano di Tecnologia in Genova, Italy, to set up and lead the PAVIS department involved in computer vision, machine learning, and image analysis issues. His main research interests include: computer vision and pattern recognition/machine learning, in particular, probabilistic techniques for image and video processing, with applications on video surveillance, biomedical image analysis and bioinformatics. Prof. Murino has co-authored ~250 papers in refereed journals and international conferences, and has been a guest co-editor of special issues in relevant scientific journals. He is a member of the editorial board of Pattern Recognition, Pattern Analysis and Applications, and Machine Vision & Applications journals, as well as of the IEEE Transactions on Systems Man, and Cybernetics – Part B: Cybernetics. Prof. Murino is a senior member of the IEEE and Fellow of the IAPR.

Sek Chai is an R&D technical manager and researcher at SRI International, where he leads a team focused on advanced embedded computing. He is currently working on low-power, high-performance systems with applications in robotics, surveillance and intelligence. Prior to joining SRI, Dr. Chai developed imaging and video solutions for next generation mobile devices and home broadband products at Motorola Labs. He co-founded ComputerVisionCentral.com, a leading on-line community for computer vision and related technologies. He oversees the Embedded Vision Workshop series, now in its eighth year. He co-edited a book on Embedded Computer Vision, and contributed a chapter on computer vision for camera phones. He was also a guest editor for a CVIU special issue on embedded vision. He is a senior member of IEEE and ACM. He holds a PhD in Electrical Engineering from Georgia Tech. One of his goals is to bridge the gap between academia and industry in the computer vision.

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Ahmed Nabil Belbachir, AIT Austrian Institute of Technology

Program Chairs:
Margrit Gelautz, Vienna University of Technology
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