

## *Publications*

### **A Peer-reviewed scientific articles: (41)**

- \* M. Taskinen, T. Sääntti, T. Lehtonen, "Plane Equation Features in Depth Sensor Tracking", In Proc. SIGMAP 2017, Madrid, Spain, 2017
- \* L. Sakari, S. Helle, S. Korhonen, T. Sääntti, O. Heimo, M. Forsman, M. Taskinen, T. Lehtonen, "Virtual and Augmented Reality Solutions to Industrial Applications", In Proc. COMPIT 2017, Cardiff, UK, 2017
- \* O. Lahdenoja, T. Sääntti, J. Poikonen, M. Laiho, A. Paasio, J. Pekkarinen, A. Salminen, "Embedded Processing Methods for Online Visual Analysis of Laser Welding", in Journal of Real-Time Image Processing, PP. 1-18, doi="10.1007/s11554-016-0605-z", 2016
- \* J. Virtanen, J. Poikonen, T. Sääntti, T. Komulainen, J. Torppa, M. Granvik, K. Muinonen, H. Pentikäinen, J. Martikainen, J. Näränen, J. Lehti, T. Flohrer, "Streak Detection and Analysis Pipeline for Space-debris Optical Images", in Advances in Space Research, Vol. 57, Iss. 8, PP. 1607-1623, 2016
- \* T. Sääntti, J. Poikonen, O. Lahdenoja, M. Laiho, A. Paasio, "Online seam tracking for laser welding with a vision chip and FPGA enabled camera system", In Proc. ISCAS 2015, Lisbon, Portugal, 2015
- \* O. Lahdenoja, T. Sääntti, A. Paasio, M. Laiho, J. Poikonen, "Seam Tracking with Adaptive Image Capture for Fine - tuning of a High Power Laser Welding Process", In Proc. International Conference on Machine Vision, Milan, Italy, 2014
- \* T. Schildknecht, J. Peltonen, T. Sääntti, J. Silha, T. Flohrer, "Improved Space Object Orbit Determination Using CMOS Detectors", In Proc. Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, Hawaii, 2014
- \* J. Virtanen, M. Granvik, J. Torppa, K. Muinonen, J. Poikonen, J. Lehti, T. Sääntti, T. Komulainen, T. Flohrer, "Streak detection and analysis pipeline for optical images", In Proc. Asteroids, Comets, Meteors 2014, Helsinki, Finland, 2014
- \* T. Sääntti, O. Lahdenoja, A. Paasio, M. Laiho, J. Poikonen, "Line Detection on FPGA with parallel sensor-level segmentation", In Proc. Cellular Nanoscale Networks and their Applications (CNNA), Notre Dame, USA, 2014
- \* J. Virtanen, T. Flohrer, K. Muinonen, M. Granvik, J. Torppa, J. Poikonen, J. Lehti, T. Sääntti, T. Komulainen, J. Näränen, "StreakDet data processing and analysis pipeline for space debris optical observations", In Proc. 40th COSPAR Scientific Assembly, Moscow, Russia, 2014
- \* J. Peltonen, H.-P. Hedman, A. Ilmanen, M. Lindroos, M. Määttänen, J. Pesonen, R. Punkkinen, A. Punkkinen, R. Vainio, E. Valtonen, T. Sääntti, J. Pentikäinen, E. Haeggström, "Electronics for the RADMON Instrument on the Aalto-1 Student Satellite", Workshop on Microelectronics Education (EWME) 2014
- \* O. Lahdenoja, T. Sääntti, M. Laiho, J. Poikonen, "Spatter Tracking in Laser-and Manual Arc Welding with Sensor-level Pre-processing", In Proc. International Conference on Computer Graphics, Visualization and Computer Vision, Plzen, Czech Republic, 2014

- \* B. Yang, L. Guang, T. Säntti and J. Plosila, “Mapping Multiple Applications with Unbounded and Bounded Number of Cores on Many-Core Networks-on-Chip”, In *Microprocessors and Microsystems*, Elsevier, 37(4-5), 460–471, 2013
- \* O. Lahdenoja, T. Säntti, J. Poikonen, M. Laiho, A. Paasio, “Characterizing Spatters in Laser Welding of Thick Steel Using Motion Flow Analysis”, In *Proc. SCIA: 18th Scandinavian Conference on Image Analysis (LNCS)*, 675–686, 2013
- \* T. Schildknecht, A. Hinze, J. Peltonen, T. Säntti, T. Flohrer, ”Improved Space Object Observation Techniques using CMOS Detectors”, In *Proc. 6th European Conference on Space Debris*, Darmstadt, Germany, 2013
- \* J. Virtanen, K. Muinonen, L. Immonen, M. Granvik, J. Torppa, J. Näränen, J. Poikonen, J. Lehti, T. Säntti, T. Komulainen, T. Flohrer, “StreakDet Data Processing and Analysis Pipeline for Space Debris”, In *Proc. European Week of Astronomy and Space Science (EWASS)*, Turku, Finland, 2013
- \* B. Yang, L. Guang, T. Säntti and J. Plosila, “Tree-Model Based Contention-Aware Task Mapping on Many-Core Networks-on-Chip”, in *Communications in Information Science and Management Engineering (CISME)*, Vol. 2 Iss. 10, PP. 22-27, 2012
- \* R. Vainio, H.-P. Hedman, E. Hægström, J. Peltonen, R. Punkkinen, T. Säntti, E. Valtonen, A. Ilmanen, M. Mera, J. Pentikäinen, J. Perälä, J. Sandhu, T. Soukka. ”RADMON – Radiation Monitor for Aalto-1 Nanosatellite”. In *Proc. Physics Days 2012*, Suomen Fyysikkoseura, 2012
- \* B. Yang, L. Guang, T. Säntti and J. Plosila. “Accelerated Simulated Annealing Algorithm for Application Mapping on Networks-on-Chip”, In *Proc. Genetic and Evolutionary Computation Conference*, Philadelphia, USA, 2012
- \* B. Yang, L. Guang, T. Säntti and J. Plosila, “Parameter-Optimized Simulated Annealing for Application Mapping on Networks-on-Chip”, In *Proc. Learning and Intelligent Optimization Conference (LION 6)*, Paris, France, 2012
- \* B. Yang, L. Guang, T. Säntti and J. Plosila, “Tree-Model Based Contention-Aware Task Mapping on Many-Core Network-on-Chips”, In *Proc. 3rd International Conference on Information Science and Engineering (ICISE2011)*, Yangzhou, China, 2011
- \* T. Säntti, J. Tyystjärvi and J. Plosila, ”An Improved Hardware Acceleration Scheme for Java Method Calls”, In *Proc. Norchip 2010*, Tampere, Finland, 2010
- \* B. Yang, L. Guang, T. Canhao Xu, A. W. Yin, T. Säntti, and J. Plosila, ”Multi-Application Multi-Step Mapping Method for Many-Core Network-on-Chips”, In *Proc. Norchip 2010*, Tampere, Finland, 2010
- \* B. Yang, L. Guang, T. Canhao Xu, T. Säntti and J. Plosila, “Multi-Application Mapping Algorithm for Network-on-Chip Platforms”, In *Proc. IEEEI 2010*, Eilat, Israel, 2010
- \* J. Tyystjärvi, T. Säntti and J. Plosila, “Efficient Bytecode Optimizations for a Multicore Java Co-Processor System”, In *Proc. 12th Biennial Baltic Electronics Conference (BEC2010)*, Tallinn, Estonia, 2010
- \* J. Tyystjärvi, T. Säntti and J. Plosila, “Heap Access Optimizations for a Hardware-Accelerated Java Virtual Machine”, In *Proc. International Symposium on System-on-Chip*, Tampere, Finland, 2010
- \* J. Tyystjärvi, T. Säntti and J. Plosila, “Parallel Performance Evaluation of a Multicore Java Co-Processor System”, in *Proc. DATE'10*, Dresden, Germany, 2010
- \* B. Yang, L. Guang, T. Säntti and J. Plosila, “A Dynamic Fault-Tolerant Remapping Algorithm Based on Tree-Model of Network-on-Chip”, in *Proc. DATE'10*, Dresden, Germany, 2010

- \* B. Yang, T. Canhao Xu, T. Sääntti and J. Plosila, "Tree-Model Based Mapping for Energy-Efficient and Low-Latency Network-on-Chip", in Proc. DDECS 2010, Vienna, Austria, 2010
- \* J. Tyystjärvi, T. Sääntti and J. Plosila, "Efficient Execution of Switch Instructions on a Multicore Java Co-Processor System", in Proc. TechPos 2009, Kuala Lumpur, Malaysia, 2009, Won the **Best Paper Award**
- \* J. Tyystjärvi, T. Sääntti and J. Plosila, "Instruction Set Enhancements for High-Performance Multicore Execution on the REALJava Platform", in Proc. NORCHIP 2008, Tallinn, Estonia, 2008
- \* T. Sääntti, J. Tyystjärvi and J. Plosila, "A Novel Hardware Acceleration Scheme for Java Method Calls", in Proc. ISCAS 2008, Seattle, USA, 2008
- \* T. Sääntti, J. Tyystjärvi and J. Plosila, "FPGA Prototype of the REALJava Co-Processor", in Proc. SoC 2007, Tampere, Finland, 2007
- \* J. Tuominen, T. Sääntti and J. Plosila, "Comparative Study of Synthesis for Asynchronous and Synchronous Cache Controllers", in Proc. Norchip 2006, Linköping, Sweden, 2006
- \* T. Sääntti and J. Plosila, "Real Time Flow Control for an Advanced Java Co-Processor", in Proc. Norchip 2005, Oulu, Finland, 2005
- \* T. Sääntti and J. Plosila, "Instruction Folding for an Asynchronous Java Co-Processor", in Proc. SoC 2005, Tampere, Finland, 2005
- \* J. Tuominen, T. Sääntti and J. Plosila, "Towards a Formal Power Estimation Framework for Hardware Systems", in Proc. SoC 2005, Tampere, Finland, 2005
- \* T. Sääntti and J. Plosila, "Architecture for an Advanced Java Co-Processor", in Proc. ISSCS 2005, Iasi, Romania, July 2005
- \* T. Sääntti and J. Plosila, "Communication Scheme for an Advanced Java Co-Processor", in Proc. Norchip 2004, Oslo, Norway, November 2004
- \* T. Nurmi, A. Jantsch, L.-R. Zheng, T. Sääntti, J. Isoaho, J. Nurmi and H. Tenhunen, "Physical Performance Modelling for Platform-Based SoC Design", in Proc. EWME 2002, Baiona, Spain, May 2002
- \* T. Sääntti and J. Isoaho, "Modified SRCMOS Cell for High-Throughput Wave Pipelined Arithmetic Units", in Proc. ISCAS 2001, Sydney, Australia, May 2001

## **B Non-refereed scientific articles (1)**

- \* T. Sääntti, J. Tyystjärvi and J. Plosila, "Java Co-Processor for Embedded Systems", In "Processor Design - System-On-Chip Computing for ASICs and FPGAs", Nurmi Jari, editor, chapter 13, pages 287-308, Springer, 2007

## **C Scientific books (1)**

- \* T. Sääntti, "A Co-Processor Approach for Efficient Java Execution in Embedded Systems", Microelectronics (Computer Systems), University of Turku, Finland, 2008

## **D Publications intended for professional communities (9)**

- \* L. Sakari, M. Forsman, M. Taskinen, T. Sääntti, T. Lehtonen, "Evaluation of the GPS Accuracy of Tablets", University of Turku Technical Reports, No 11, 2016
- \* M. Taskinen, O. Lahdenoja, T. Sääntti, S. Jokela, T. Lehtonen, "Depth Sensors in Augmented Reality Solutions. Literature Review", University of Turku Technical Reports, No 10, 2015

- \* S. Korhonen, L. Sakari, T. Säntti, O. Lahdenoja and T. Lehtonen, “Hardware Accelerated Visual Tracking Algorithms. A Systematic Literature Review”, University of Turku Technical Reports, No 5, 2015
- \* O. Lahdenoja, R. Suominen, T. Säntti and T. Lehtonen, “Recent advances in monocular model-based tracking: a systematic literature review”, University of Turku Technical Reports, No 8, 2015
- \* M. Kaustinen, M. Taskinen, T. Säntti, J. Arvo and T. Lehtonen, “Map matching by using inertial sensors: literature review”, University of Turku Technical Reports, No 6, 2015
- \* J. Tuominen, T. Säntti and J. Plosila, ”Feasibility Report on Asynchronous Synthesis”, TUCS Technical Report, No 765, Apr 2006
- \* T. Säntti and J. Plosila, ”Instruction Folding and Real Time Flow Control for a Java Execution Unit”, TUCS Technical Report, No 707, August 2005
- \* T. Säntti and J. Plosila, “Internal Structure of an Enhanced Java Execution Engine”, TUCS Technical Report, No 665, February 2005
- \* J. Tuominen, T. Säntti and J. Plosila, ”Towards a Formal Power Estimation Framework”, TUCS Technical Report, No 672, March 2005

### **E Publications intended for the general public (1)**

- \* J. Tuominen and T. Säntti, ”Go japanissa”, (English: The game of Go in Japan), Japan Pop (2), 64, 2007

### **F Public artistic and design activities (0)**

-none-

### **G Theses (3)**

- \* T. Säntti, ”A Co-Processor Approach for Efficient Java Execution in Embedded Systems”, Microelectronics (Computer Systems), University of Turku, Finland, 2008
- \* T. Säntti, “Implementation of High Speed Wave-Pipelined Arithmetic Units”, M.Sc. Thesis, Department of Information Technology, University of Turku, Finland, 2002
- \* T. Säntti, “Pipeline Structures”, B.Sc. Thesis, Department of Applied Physics, University of Turku, Finland, 2001

### **H Patents and invention disclosures (0)**

-none-

### **I Audiovisual material, ICT software (0)**

-none-

### **J Others**

### **J1 Lecture material:**

- \* T. Säntti, "FPGA Prototyping", Lecture material, Department of Information Technology, University of Turku, 2010, 2011 & 2012
- \* T. Säntti, "Sulautetut prosessorijärjestelmät" (Embedded processor systems), Lecture material, Department of Information Technology, University of Turku, 2009, 2010 & 2011
- \* T. Säntti, "Mikroprosessoripohjaiset järjestelmät" (Microprocessor based systems), Lecture material, Department of Information Technology, University of Turku, 2005, 2006, 2007 & 2008
- \* T. Säntti, "Embedded Virtual Machines on FPGAs", Lecture material, Department of Information Technology, University of Turku, 2007

### **J2 ESA/SOLO/EPD/LET Documents: (13)**

- \* T. Säntti, "ASRO-SOLO-DA-001-FPGA-Datasheet", 2011
- \* T. Säntti, "ASRO-SOLO-PL-002-FPGA-Development-Plan", 2011
- \* T. Säntti, "ASRO-SOLO-TN-003-FPGA-Selection", 2011
- \* T. Säntti, "ASRO-SOLO-TN-004-FPGA-Requirements", 2011
- \* T. Säntti, "ASRO-SOLO-TN-005-FPGA-Prototypes", 2011
- \* T. Säntti, "ASRO-SOLO-TN-006-New\_NV\_Memory\_Map", 2012
- \* T. Säntti, "SO-EPD-LET-DA-1001-FPGA-Datasheet", 2011
- \* T. Säntti, "SO-EPD-LET-PL-1002-FPGA-Development-Plan", 2011
- \* T. Säntti, "SO-EPD-LET-RS-1001-FPGA-Requirements", 2011
- \* T. Säntti, "SO-EPD-LET-TN-1003-FPGA-Selection", 2011
- \* T. Säntti, "SO-EPD-LET-TN-1008-FPGA-Instruction\_Set", 2011
- \* T. Säntti, "SO-EPD-LET-TN-1009-FPGA-Pinout", 2011
- \* T. Säntti, "SO-EPD-LET-TN-1011-FPGA-Power-Estimation", 2012

### **J3 ESA/ISOOS Documents: (18)**

- \* T. Säntti, "ISOOS-ASRO-MN-001-Minutes-of-Meeting", 2012
- \* T. Säntti, "ISOOS-ASRO-PR-004-Progress-Report", 2012
- \* T. Säntti, "ISOOS-ASRO-PR-005-Progress-Report", 2012
- \* T. Säntti, "ISOOS-ASRO-MN-002-Minutes-of-Meeting", 2012
- \* T. Säntti, "ISOOS-ASRO-PR-006-Progress-Report", 2012
- \* T. Säntti, "ISOOS-ASRO-PR-007-Progress-Report", 2012
- \* T. Säntti, "ISOOS-ASRO-PR-008-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-MN-003-Minutes-of-Meeting", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-009-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-010-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-011-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-012-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-013-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-PR-014-Progress-Report", 2013
- \* T. Säntti, "ISOOS-ASRO-MN-004-Minutes-of-Meeting", 2013
- \* J. Poikonen, T. Säntti, J. Peltonen, "ISOOS-ASRO-TN-001 CMOS focal plane survey", 2013
- \* T. Säntti, J. Peltonen, T. Schildknecht, J. Silha, "ISOOS-ASRO-TN-002-Final Report", 2013

- \* T. Säntti, J. Peltonen, T. Schildknecht, J. Silha, "ISOOS-ASRO-TN-003 Executive Summary, 2013

#### **J4 ESA/StreakDet Documents: (7)**

- \* T. Säntti, T. Komulainen, J. Lehti, J. Virtanen, J. Torppa, J. Näränen, K. Muinonen, M. Granvik, J. Poikonen, "STREAKDET\_ASRO\_MA\_001 User Manual", 2014
- \* T. Komulainen, T. Säntti, J. Lehti, J. Virtanen, J. Torppa, J. Näränen, K. Muinonen, M. Granvik, J. Poikonen, "STREAKDET\_ASRO\_TN\_004 Software Documentation", 2014
- \* J. Virtanen, J. Torppa, J. Näränen, J. Lehti, T. Säntti, T. Komulainen, J. Poikonen, K. Muinonen, M. Granvik, J. Martikainen, H. Pentikäinen, "STREAKDET\_FGI\_FR\_001 Final Report", 2014
- \* J. Virtanen, J. Torppa, J. Näränen, J. Lehti, T. Säntti, T. Komulainen, J. Poikonen, K. Muinonen, M. Granvik, J. Martikainen, H. Pentikäinen, "STREAKDET\_FGI\_ExSum Executive Summary", 2014
- \* J. Virtanen, J. Torppa, J. Näränen, K. Muinonen, M. Granvik, J. Poikonen, J. Lehti, T. Säntti, T. Komulainen, "STREAKDET\_FGI\_TN\_001 Technical report: Review", 2013
- \* J. Virtanen, J. Torppa, J. Näränen, K. Muinonen, M. Granvik, J. Poikonen, J. Lehti, T. Säntti, T. Komulainen, "STREAKDET\_FGI\_TN\_002 Technical report: Algorithms", 2014
- \* J. Virtanen, J. Torppa, J. Näränen, K. Muinonen, M. Granvik, J. Poikonen, J. Lehti, T. Säntti, T. Komulainen, "STREAKDET\_FGI\_TN\_003 Technical report: Prototype Implementation and Performance Assessment", 2014

#### **J5 ESA/EuCPAD Documents: (2)**

- \* T. Säntti, "ASRO-EuCPAD-PSD-TN-004 Database Descriptions", 2015
- \* T. Säntti, M. Hirvonen, "ASRO-EuCPAD-PSD-MA-002 Operational manual of PSD software EGSE", 2015