

Associate Professor Ilker Hamzaoglu, IEEE Senior Member

Faculty of Engineering and Natural Sciences
Sabanci University
Orhanli, Tuzla, 34956 Istanbul, Turkey

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EDUCATION

PhD, 9/1999, Computer Science, University of Illinois at Urbana-Champaign, USA
Thesis: Test Pattern Generation and Test Application Time Reduction Algorithms for VLSI Circuits
GPA: 4 (over 4)

MS, 7/1993, Computer Engineering, Bogazici University, Istanbul, Turkey
Thesis: Machine Translation from Turkish to Other Turkic Languages
GPA: 4 (over 4), Rank: 1st in the Department

BS, 7/1991, Computer Engineering, Bogazici University, Istanbul, Turkey
GPA: 3.66 (over 4), High Honor Student, Rank: 1st in the Department

High School, 6/1986, Affan Kitapcioglu High School, Trabzon, Turkey
GPA: 9.88 (over 10), Rank: 1st in the School

WORK EXPERIENCE

9/2003 - present, Faculty Member
Faculty of Engineering & Natural Sciences, Sabanci University, Istanbul, Turkey

12/2002 - 8/2003, Principle Staff Engineer (E11)
8/1999 - 11/2002, Senior Staff Engineer (E10)
Multimedia Architecture Lab, Motorola Inc., Schaumburg, IL, USA

Summer 1998 and Summer 1999, Visiting Lecturer
Department of Computer Science, University of Illinois at Urbana-Champaign, IL, USA

6/1996 - 9/1996, Staff Research Assistant
Computational Science Methods Group, X Division, Los Alamos National Laboratory, NM, USA

1/1994 - 7/1999, Teaching and Research Assistant
Computer Science and Electrical and Computer Engineering Departments, University of Illinois at Urbana-Champaign, IL, USA

9/1991 - 7/1993, Teaching and Research Assistant
Department of Computer Engineering, Bogazici University, Istanbul, Turkey

RESEARCH INTERESTS

Digital System-on-Chip ASIC and FPGA Design, Low Power Digital VLSI Circuit Design, Digital Video Processing and Compression, Embedded System Design, Computer-Aided Testing of Digital Systems

RESEARCH EXPERIENCE

I founded SoC Design & Test Lab (<http://fens.sabanciuniv.edu/soclab>) at Sabanci University.

Current Project: Low Power Motion Estimation Hardware Design for H.264 Multiview Video Coding Supported by TUBITAK (The Scientific and Technological Research Council of Turkey), EEEAG 111E013

Duration: September 2011 - August 2013

Budget: \$75,000

Contribution: I'm directing this research project and 2 graduate students are working under my supervision. We are designing and implementing motion estimation hardware for H.264 multiview video coding. We are developing low power techniques for reducing the power consumptions of these motion estimation hardware and assessing their impact on the power consumption.

Completed Projects

Project: Low Power Motion Estimation Hardware Design for Video Compression and Frame Rate Conversion

Supported by TUBITAK, EEEAG 108E239

Duration: February 2009 - April 2011

Budget: \$100,000

Contribution: I directed this research project and 2 graduate students worked under my supervision. We designed and implemented motion estimation hardware for video compression and frame rate conversion. We developed low power techniques for reducing the power consumptions of these motion estimation hardware and assessed their impact on the power consumption.

Project: Low Complexity Motion Estimation Techniques and Their SoC Implementation

Partners: Kocaeli University, Turkey and Seoul National University, Korea

Supported by TUBITAK and Korea Research Foundation (KRF), EEEAG 107E179

Duration: March 2008 - February 2010

Budget for Sabanci University: \$50,000

Contribution: I worked as a researcher in this project and 1 graduate student in Sabanci University worked under my supervision. Sabanci University was responsible for developing efficient SoC implementations for the low complexity motion estimation techniques developed by our partners.

Project: Low Power H.264 Video Encoder Design for Portable Applications

Supported by TUBITAK, EEEAG 106E153

Duration: February 2007 - January 2009

Budget: \$120,000

Contribution: I directed this research project and 3 graduate students worked under my supervision. We designed and implemented additional hardware modules, such as mode decision and motion compensation, and built a complete baseline H.264 video encoder system by integrating them to the existing H.264 intra frame coder system. We developed low power techniques for reducing the power consumption of this H.264 video encoder and assessed their impact on its power consumption.

Project: H.264 Video Encoder Hardware Design
Supported by Sabanci University, Istanbul, Turkey
Duration: July 2004 - August 2006
Budget: \$70,000

Contribution: I directed this research project and 5 graduate students worked under my supervision. We designed and implemented a baseline H.264 intra frame coder system. The hardware is implemented in Verilog HDL. The system also includes a software running on an Arm926EJS processor for implementing pre-processing and post-processing functions. The H.264 intra frame coder system is verified to work correctly on an Arm Versatile Platform development board with a Xilinx Virtex II FPGA. We also designed and implemented a sub-pixel accurate H.264 variable block size motion estimation hardware.

5/1997 - 7/1999, Research Assistant

Center for Reliable & High-Performance Computing, University of Illinois at Urbana-Champaign

Project: Test Generation and Test Application Time Reduction Algorithms for VLSI Circuits
Supported by SRC and DARPA

Contribution: I developed new efficient deterministic test pattern generation techniques for combinational and sequential VLSI circuits, new compact test set generation algorithms for combinational circuits under the stuck at, transition delay and CMOS stuck-open fault models, a new design-for-testability technique for reducing the test application time for both standalone and embedded full scan circuits, and a new technique for reducing the test application time for BIST test pattern generators. I designed a state-of-the-art ATPG software incorporating these techniques and implemented it in C++.

6/1996 - 9/1996, Staff Research Assistant

Computational Science Methods Group, X Division, Los Alamos National Laboratory, NM, USA

Project: PADMA: PARallel Data Mining Agents For Scalable Text Classification
Supported by Caterpillar and Department of Energy

Contribution: I parallelized the sequential implementation of a hierarchical clustering algorithm, designed and implemented the PADMA software in C++ on top of the PPFS software, and carried out performance analysis of the PADMA software on an IBM SP2.

5/1995 - 5/1996, Research Assistant

Department of Computer Science, University of Illinois at Urbana-Champaign, USA

Project: Portable Parallel File System (PPFS)
Supported by NSF

Contribution: I ported the PPFS software written in C++ with MPI library to HP-Convex Exemplar and to PVM library, optimized the PPFS software, designed and implemented prefetching infrastructure and sequential prefetching, conducted input/output performance analysis of a chemistry code running on PPFS on an IBM SP2 and an Intel Paragon using the Pablo performance analysis suite to assess the effectiveness of tuning parallel file system policies to match the application access patterns on application performance.

7/1992 - 7/1993, Research Assistant

Department of Computer Engineering, Bogazici University, Istanbul, Turkey

Project: A Spelling Checker and Corrector for Turkish to be integrated with ALL-IN-1, Digital Equipment Corporation's Office Automation Package
Supported by Digital Equipment Corporation

Contribution: I participated in the design of the software, and implemented it in Pascal on an IBM PC and later ported it to a VAX 4000-200.

THESES SUPERVISED

PhD Thesis

Power Consumption Reduction Techniques for H.264 Video Compression Hardware
Yusuf Adibelli, Sabanci University, August 2012

Current Position: TUBITAK - National Research Institute of Electronics and Cryptology, Kocaeli, Turkey
(Yusuf awarded TUBITAK international postdoctoral researcher scholarship in December 2012, and he received an invitation letter to join Carnegie Mellon University, USA with this scholarship as a postdoctoral researcher.)

Motion Estimation Based Frame Rate Up-Conversion Hardware Design

Ozgur Tasdizen, Sabanci University, June 2010

Current Position: Broadcom, Cambridge, United Kingdom

Low Power H.264 Video Compression Hardware Designs

Mustafa Parlak, Sabanci University, February 2009

(Mustafa received Gursel Sonmez Research Award from Sabanci University in June 2009)

First Position: Postdoctoral Researcher, Georgia Institute of Technology, Atlanta, Georgia, USA

Current Position: TUBITAK - National Research Institute of Electronics and Cryptology, Kocaeli, Turkey

Master Thesis

Low Energy HEVC Video Compression Hardware Designs

Ercan Kalali, Sabanci University, (Expected) August 2013

Low Energy HEVC Video Compression Hardware Designs

Erdem Ozcan, Sabanci University, (Expected) August 2013

Low Energy Motion Estimation Hardware Designs for H.264 Multiview Video Coding

Yusuf Aksehir, Sabanci University, (Expected) August 2013

Low Energy Motion Estimation Hardware Designs for H.264 Multiview Video Coding

Kamil Erdayandi, Sabanci University, (Expected) August 2013

Efficient Demosaicing Hardware Designs

Serkan Yaliman, Sabanci University, (Expected) August 2013

Low Power Frame Rate Up-Conversion Hardware Designs

Zafer Ozcan, Sabanci University, August 2011

Current Position: TUBITAK - National Research Institute of Electronics and Cryptology, Kocaeli, Turkey

Low Power Motion Estimation Hardware Designs

Onur Can Ulusel, Sabanci University, August 2010

Current Position: PhD Student, Brown University, USA

Baseline H.264 Video Encoder Hardware Design

Aydin Aysu, Sabanci University, August 2010

Current Position: PhD Student, Virginia Tech, USA

High Performance Hardware Architectures for One-Bit Transform Based Motion Estimation
Abdulkadir Akin, Sabanci University, June 2010
(*Abdulkadir received Gursel Sonmez Research Award from Sabanci University in June 2010*)
Current Position: PhD Student, Ecole Polytechnique Federale de Lausanne, Switzerland

An Adaptive True Motion Estimation Algorithm for Frame Rate Up-Conversion and Its Hardware Design
Mert Cetin, Sabanci University, August 2009
Current Position: Tart New Media, Istanbul, Turkey

Dynamic Power Consumption Estimation and Reduction for Full Search Motion Estimation Hardware
Caglar Kalaycioglu, Sabanci University, July 2009
Current Position: CMOSVision, GOSB Technopark, Kocaeli, Turkey

Low Power IEEE 802.11n Low-Density Parity Check (LDPC) Decoder Hardware Design
Merve Peyic, Sabanci University, August 2008
Current Position: ST Ericsson, Istanbul Design Center, Turkey

Sub-pixel Accurate H.264 Motion Estimation Hardware Design
Serkan Oktem, Sabanci University, June 2007
Current Position: CMOSVision, GOSB Technopark, Kocaeli, Turkey

An Efficient H.264 Intra Frame Coder Hardware Design
Esra Sahin, Sabanci University, August 2006
Current Position: ST Microelectronics, Istanbul Design Center, Turkey

H.264 Intra Frame Coder System Design
Ozgur Tasdizen, Sabanci University, August 2005
Current Position: Vestel Electronic R&D, Istanbul, Turkey

H.264 Motion Estimator Design
Sinan Yalcin, Sabanci University, August 2005
Current Position: Vestel Electronic R&D, Istanbul, Turkey

INDUSTRIAL EXPERIENCE

Reviewer for TUBITAK (The Scientific and Technological Research Council of Turkey)
Reviewer (5 projects) and Project Monitor (1 project), TUBITAK Industry R&D Projects, 2005-2009

Reviewer for TTGV (Technology Development Foundation of Turkey)
Reviewer (2 projects) and Project Monitor (1 project), TTGV Industry R&D Projects, 2004-2009

Reviewer for TUBITAK, TTGV and TUSIAD (Turkish Industrialists and Businessmen Association)
Technology Awards, 2009

October 2007 - June 2009, Several undergraduate students at Sabanci University did their senior year graduation projects and one graduate student at Sabanci University did his PhD thesis under my supervision in collaboration with Vestek in Istanbul (<http://www.vestek.com.tr> , electronics R&D company owned by Vestel Electronics, the leading consumer electronics company in Turkey) as part of the development of digital video enhancement ICs for their Pixellence LCD TV products (<http://www.vestelpixellence.com/en>).

June 2006 – February 2007, I was the contact person at Sabanci University for the MEDEA+ 2A103 MIMOWA (MIMO Technologies for Wireless Access) project. MEDEA+ (<http://www.medeas.org>) - EUREKA 2365- is the industry-driven pan-European programme for advanced co-operative R&D in microelectronics. Sabanci University together with STMicroelectronics in Turkey was a partner in the consortium proposing the MIMOWA project which was aiming to simulate, implement and validate multiple input multiple output (MIMO) building blocks for different wireless interfaces in mobile and fixed applications. The MIMOWA project full proposal prepared by Agilent Technologies, Alcatel-Lucent, AWE Communications, Infineon, OMP, Runcom, STMicroelectronics, Telecommunications Technological Centre of Catalonia (CTTC), Telefonica, Uni Applied Sciences Cologne (CUAS), Uni Politecnica de Catalunya (UPC) and Sabanci University was accepted by MEDEA+. While STMicroelectronics in Turkey and Sabanci University were in the process of applying to local EUREKA authority in Turkey (TUBITAK), TUBITAK reduced its funding amount for University partners in EUREKA projects. Because of this change in TUBITAK funding policy, Sabanci University could not participate in the MIMOWA project.

12/2002 - 8/2003, Principle Staff Engineer (E11)

9/1999 - 11/2002, Senior Staff Engineer (E10)

Multimedia Architecture Lab, Motorola Inc., Schaumburg, IL, USA

Projects:

1/2003 - 8/2003, SoC ASIC for an Image Processing / Vision Application

Contribution: I participated in the top-level design of this ASIC. I worked on designing an interface for using a special-purpose coprocessor with an Arm core. I designed the overall software architecture of a cycle-accurate simulator for a special purpose on-chip memory subsystem, implemented the cycle-accurate simulator for the special purpose cache in this memory subsystem in C++ and integrated the memory subsystem simulator to the system simulation environment. I worked on designing the memory subsystem using this simulator for performance analysis.

3/2001 - 12/2002, Image Processing Platform SoC ASIC

Contribution: I was responsible for the top-level development of this ASIC which included an ARM processor, various accelerators and peripherals. This involved participating in the top-level design, performance analysis, and determining the pin list, designing and implementing the top-level RTL in Verilog, working with module designers and reviewing their designs, working with DFT team to define the BIST and Scan insertion strategy and implementing the top-level DFT RTL, synthesizing the top-level design, performing static timing analysis for main modules, writing the top-level testbench and setting up various simulation environments, playing a major role in functional and timing design verification by running simulations and debugging the related problems, working with physical design team to resolve timing problems in the layout, providing support to emulation team, evaluation board designer, and product engineer, generating functional patterns for manufacturing testing, writing test software in C and ARM assembly to verify the basic functionality of the system, providing support to software team and debugging various software problems with hw/sw co-simulation, participating in setting up the chip debugging environment, writing Verilog RTL for the FPGA on the evaluation board, and playing a major role in chip testing and debug by testing the top-level ASIC and various modules, and debugging related problems.

9/1999 - 2/2001, MPEG4 Video Codec ASIC

Contribution: I designed two sub-modules in the encoder, implemented them using Verilog HDL, synthesized and verified them. I participated in the design of the encoder module and implemented it using Verilog. I wrote the control software in a 16-bit Risc Cpu assembly language and integrated this with the rest of the encoder software. I verified the encoder module with hardware/software co-simulations.

TEACHING EXPERIENCE

Faculty Member

Electronics Engineering, Sabanci University, Istanbul, Turkey

EL 310 Hardware Description Languages (Spring 2004 – Spring 2013)

EL 401 VLSI System Design I (Fall 2003 – Fall 2012)

EL 402 VLSI System Design II (System-on-Chip ASIC Design) (Spring 2004 - Spring 2009, Spring 2013)

EE 542 Digital Systems Verification and Testing (Spring 2004, Fall 2005, Fall 2007)

EE 634 VLSI Array Processors for Signal Processing (Fall 2004, Fall 2006, Fall 2008, Fall 2010)

EE 537 Advanced Topics in VLSI Design (Low Power Digital Hardware Design) (Fall 2009, Fall 2012)

EE 580 Special Topics in Microelectronics I (Video Compression Algorithm and Hardware) (Fall 2011)

Visiting Lecturer

Department of Computer Science, University of Illinois at Urbana-Champaign, USA

CS231 Computer Architecture I (Summer 1998, Summer 1999)

Teaching Assistant

Department of Computer Science, University of Illinois at Urbana-Champaign, USA

CS225 Data Structures and Software Principles (Summer 1997)

CS333 Computer System Organization (Fall 1996, Spring 1997)

CS348 Introduction to Artificial Intelligence (Fall 1994, Spring 1995)

CS257 Introduction to Numerical Analysis (Spring 1994)

Teaching Assistant

Department of Computer Engineering, Bogazici University, Istanbul, Turkey

CMPE450 Software Engineering (Fall 1991)

CMPE223 Data Structures and Algorithms I (Fall 1991)

CMPE224 Data Structures and Algorithms II (Spring 1992)

CMPE100 Computer Programming (Fall 1992, Spring 1993)

PROFESSIONAL ACTIVITIES

Reviewer for TUBITAK (The Scientific and Technological Research Council of Turkey)

Panelist (4 1001 project panels), Reviewer (2 1002 projects) and Project Monitor (1 1001 project),
TUBITAK University Research Projects, 2007-2011

I participated to the invitation only annual Academic Reputation Survey by Thomson Reuters and Times Higher Education in 2012 which supports the Times Higher Education (THE) World University Rankings.

Editorial Board Member, IEEE Transactions on Consumer Electronics (SCI), July 2011 - present
Associate Editor (2 articles), Turkish Journal of Electrical Engineering and Computer Sciences (SCI)

Reviewer for International Journals (SCI)

IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Multimedia,
IEEE Transactions on Computer-Aided Design, IEEE Design & Test of Computers, IEEE Signal
Processing Letters, Journal of Real-Time Image Processing, Microprocessors and Microsystems:
Embedded Hardware Design, ACM Transactions on Design Automation, ACM Transactions on
Embedded Computing Systems, Integration – The VLSI Journal, Journal of Electronic Testing, Turkish
Journal of Electrical Engineering and Computer Sciences

International Conferences

Track Co-Chair, IEEE/IFIP Int. Symposium on VLSI System-on-Chip, Oct. 2013, Istanbul, Turkey

Session Chair

15th Euromicro Conference on Digital System Design, September 2012, Izmir, Turkey

13th Euromicro Conference on Digital System Design, September 2010, Lille, France

20th International Conference on Pattern Recognition, August 2010, Istanbul, Turkey

Technical Program Committee Member

Conference on Design and Architectures for Signal and Image Processing
(October 2013, Cagliari, Italy)

IEEE International Symposium on Consumer Electronics
(June 2013, Hsinchu, Taiwan, R.O.C.)

Design, Automation & Test in Europe (DATE) Conference
(March 2012, Dresden, Germany) , (March 2013, Grenoble, France)

International Conference on Field Programmable Logic and Applications
(September 2010, Milano, Italy) , (September 2011, Crete, Greece) , (August 2012, Oslo, Norway) ,
(September 2013, Porto, Portugal)

Euromicro Conference on Digital System Design
(September 2010, Lille, France) , (September 2011, Oulu, Finland) , (September 2012, Izmir, Turkey) ,
(September 2013, Santander, Spain)

IEEE/IFIP International Symposium on VLSI System-on-Chip
(September 2010, Madrid, Spain) , (October 2013, Istanbul, Turkey)

NASA/ESA Conference on Adaptive Hardware and Systems
(June 2006, Istanbul, Turkey) , (Aug. 2007, Edinburgh, UK) , (June 2008, Noordwijk, The Netherlands)

Reviewer

Design Automation Conference, Int. Conference on Computer-Aided Design, Int. Test Conference,
IEEE VLSI Test Symposium, European Conference on Circuit Theory & Design

National Conferences

Program Co-Chair, Embedded Systems and Applications Symposium, November 2012, Istanbul, Turkey

Session Chair, Embedded Systems and Applications Symposium, November 2012, Istanbul, Turkey

Technical Program Committee Member

IEEE Signal Processing and Communications Applications Conference
(April 2009, Antalya, Turkey) , (April 2010, Diyarbakir, Turkey) , (April 2011, Antalya, Turkey) ,
(April 2012, Mugla, Turkey)

Embedded Systems and Applications Symposium
(November 2010, Istanbul, Turkey) , (November 2012, Istanbul, Turkey)

Faculty of Engineering and Natural Sciences, Sabanci University

Microelectronics Program Coordinator, March 2004 – March 2006

Electronics Engineering Program Co-Coordinator, April 2006 – October 2008

Proj102 Freshman Project Course Coordinator, Fall 2005 – Spring 2006

Proj102 Freshman Project Course Committee Member, Fall 2006 – Spring 2007

PhD Qualification Exam Committee Member, November 2008 – September 2010

Curriculum Committee Member, November 2011 – July 2012
Electronics Engineering Graduate Seminar Coordinator, August 2012 - present
Proj102 Freshman Project Supervisor of 33 Undergraduate Students
Senior Graduation Project Supervisor of 48 Undergraduate Students
Thesis Defense Committee Member of 14 MS students
Qualification Exam Committee Member of 9 PhD students

Reviewer for Istanbul Technical University Scientific Research Projects, 2009

Committee Member for Electrical and Electronics Engineering Department, Bogazici University
Thesis Defense Committee of 1 MS student, 2008
Qualification Exam Committee of 2 PhD students, 2008-2010

Committee Member for Electronics and Telecommunications Engineering Department, Kocaeli University
Thesis Defense Committee of 2 PhD students, 2008-2009
Qualification Exam Committee of 1 PhD student, 2009

Member of Fellowships, Assistantships, and Admissions Committee, Department of Computer Science, University of Illinois at Urbana-Champaign, 1996-1997

AWARDS and HONORS

My publications received more than 800 citations according to Web of Science, March 2013
My publications received more than 1400 citations according to Google Scholar, March 2013

IEEE Senior Member, July 2012

Listed in Marquis Who's Who in Science and Engineering, 2011-2012
Listed in Marquis Who's Who in the World, 2010-2012

Best Paper Prize in Adaptive and Reconfigurable Circuits for Multimedia Category in NASA/ESA Conference on Adaptive Hardware and Systems, August 2007, Edinburgh, Scotland, UK

Bravo Awards for outstanding contributions to MPEG4 Video Codec ASIC and Image Processing Platform SoC ASIC, Motorola Labs, Illinois, USA, 2001 and 2002

W. J. Poppelbaum Memorial Award for Excellent Research in Computer Hardware, Department of Computer Science, University of Illinois at Urbana-Champaign, 1999

TUBITAK NATO Science Fellowship Award for Graduate Studies in USA, 1993

Undergraduate Education Scholarship from Istanbul Chamber of Industry, 1988-1991

Excellence Scholarship from AY-TEST Periodical (because of my score in the University Entrance Exam), 1986

Scored 664.138 in Mathematics and Natural Sciences (which was enough to register to any Department in Engineering and Medicine in all Universities in Turkey) in the University Entrance Exam in Turkey, 1986

Incitement Award in Mathematics Competition organized by TUBITAK among High School Senior Students in Turkey, 1986

REFEREED PUBLICATIONS

JOURNALS (SCI)

Merve Peyic, Hakan Baba, Erdem Guleyuboglu, Ilker Hamzaoglu, Mehmet Keskinoz
A Low Power Multi-Rate Decoder Hardware for IEEE 802.11n LDPC Codes
Microprocessors and Microsystems: Embedded Hardware Design, vol. 36, issue 3, pp. 159-166, May 2012

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
Computation and Power Reduction Techniques for H.264 Intra Prediction
Microprocessors and Microsystems: Embedded Hardware Design, vol. 36, issue 3, pp. 205-214, May 2012

Abdulkadir Akin, Mert Cetin, Zafer Ozcan, Burak Erbagci, Ilker Hamzaoglu
An Adaptive Bilateral Motion Estimation Algorithm and its Hardware Architecture
IEEE Transactions on Consumer Electronics, vol. 58, no. 2, May 2012

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
Energy Reduction Techniques for H.264 Deblocking Filter Hardware
IEEE Transactions on Consumer Electronics, vol. 57, no. 3, August 2011

Aydin Aysu, Gokhan Sayilar, Ilker Hamzaoglu
A Low Energy Adaptive Hardware for H.264 Multiple Reference Frame Motion Estimation
IEEE Transactions on Consumer Electronics, vol. 57, no. 3, August 2011

Mert Cetin and Ilker Hamzaoglu
An Adaptive True Motion Estimation Algorithm for Frame Rate Conversion of High Definition Video and Its Hardware Implementations, IEEE Transactions on Consumer Electronics, vol. 57, no. 2, May 2011

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
Pixel Similarity Based Computation and Power Reduction Technique for H.264 Intra Prediction
IEEE Transactions on Consumer Electronics, vol. 56, no. 2, pp. 1079-1087, May 2010

Abdulkadir Akin, Gokhan Sayilar, Ilker Hamzaoglu
High Performance Hardware Architectures for One Bit Transform Based Single and Multiple Reference Frame Motion Estimation
IEEE Transactions on Consumer Electronics, vol. 56, no. 2, pp. 1144-1152, May 2010

Ozgur Tasdizen, Halil Kukner, Abdulkadir Akin, Ilker Hamzaoglu
Dynamically Variable Step Search Motion Estimation Algorithm and a Dynamically Reconfigurable Hardware for Its Implementation
IEEE Transactions on Consumer Electronics, vol. 55, no. 3, pp. 1645-1653, August 2009

Anil Celebi, Oguzhan Urhan, Ilker Hamzaoglu, Sarp Erturk
Efficient Hardware Implementations of Low Bit Depth Motion Estimation Algorithms
IEEE Signal Processing Letters, vol. 16, no. 6, pp. 513-516, June 2009

Abdulkadir Akın, Yigit Dogan, Ilker Hamzaoglu
High Performance Hardware Architectures for One Bit Transform Based Motion Estimation
IEEE Transactions on Consumer Electronics, vol. 55, no. 2, pp. 941-949, May 2009

Anıl Celebi, Orhan Akbulut, Oguzhan Urhan, Ilker Hamzaoglu, Sarp Erturk
An All Binary Sub-Pixel Motion Estimation Approach and its Hardware Architecture
IEEE Transactions on Consumer Electronics, vol. 54, no. 4, pp. 1928-1937, November 2008

Mustafa Parlak, Yusuf Adibelli, Ilker Hamzaoglu
A Novel Computational Complexity and Power Reduction Technique for H.264 Intra Prediction
IEEE Transactions on Consumer Electronics, vol. 54, no. 4, pp. 2006-2014, November 2008

Ilker Hamzaoglu, Ozgur Tasdizen, Esra Sahin
An Efficient H.264 Intra Frame Coder System
IEEE Transactions on Consumer Electronics, vol. 54, no. 4, pp. 1903-1911, November 2008

Mustafa Parlak and Ilker Hamzaoglu
Low Power H.264 Deblocking Filter Hardware Implementations
IEEE Transactions on Consumer Electronics, vol. 54, no. 2, pp. 808-816, May 2008

Ilker Hamzaoglu and Janak H. Patel
Test Set Compaction Algorithms for Combinational Circuits
IEEE Transactions on Computer-Aided Design, vol. 19, no. 8, pp. 957-963, August 2000

Ilker Hamzaoglu and Janak H. Patel
New Techniques for Deterministic Test Pattern Generation
Journal of Electronic Testing, vol. 15, no. 1/2, pp. 63-73, October 1999

BOOK CHAPTERS

Ilker Hamzaoglu and Huseyin Simitci
Performance Analysis of Tape Libraries for Supercomputing Environments
High Performance Computing Systems and Applications
Chapter 54, Pages 559-574, ISBN 978-0-7923-7774-0, Springer, 2002

INTERNATIONAL CONFERENCES

Low Power Digital Hardware Design

Yusuf Aksehir, Kamil Erdayandi, Zafer Ozcan, Ilker Hamzaoglu
A Low Energy Adaptive Motion Estimation Hardware for H.264 Multiview Video Coding
Conference on Design and Architectures for Signal and Image Processing, Oct. 2012, Karlsruhe, Germany

Ercan Kalali, Yusuf Adibelli, Ilker Hamzaoglu
A High Performance and Low Energy Intra Prediction Hardware for HEVC Video Decoding
Conference on Design and Architectures for Signal and Image Processing, Oct. 2012, Karlsruhe, Germany

Ercan Kalali, Yusuf Adibelli, Ilker Hamzaoglu
A High Performance and Low Energy Intra Prediction Hardware for High Efficiency Video Coding
22nd International Conference on Field Programmable Logic and Applications, August 2012, Oslo, Norway

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
A Novel Energy Reduction Technique for H.264 Intra Mode Decision
IEEE International Conference on Image Processing, September 2011, Brussels, Belgium

Abdulkadir Akin, Onur Can Ulusel, Zafer Ozcan, Gokhan Sayilar, Ilker Hamzaoglu
A Novel Power Reduction Technique for Block Matching Motion Estimation Hardware
21st International Conference on Field Programmable Logic and Applications, Sept. 2011, Crete, Greece

Caglar Kalaycioglu and Ilker Hamzaoglu
Dynamic Power Estimation for Motion Estimation Hardware
14th Euromicro Conference on Digital System Design, August 2011, Oulu, Finland

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
A Computation and Power Reduction Technique for H.264 Intra Prediction
13th Euromicro Conference on Digital System Design, September 2010, Lille, France

Yusuf Adibelli, Mustafa Parlak, Ilker Hamzaoglu
Pixel Similarity Based Computation and Power Reduction Technique for H.264 Intra Prediction
20th International Conference on Field Programmable Logic and Applications, August 2010, Milano, Italy

Caglar Kalaycioglu, Onur Ulusel, Ilker Hamzaoglu
Low Power Techniques for Motion Estimation Hardware
19th International Conference on Field Programmable Logic and Applications, September 2009, Prague, Czech Republic

Merve Peyic, Hakan Baba, Ilker Hamzaoglu, Mehmet Keskinöz
Low Power IEEE 802.11n LDPC Decoder Hardware
16th IFIP/IEEE International Conference on VLSI-SoC, October 2008, Rhodes Island, Greece

Mustafa Parlak and Ilker Hamzaoglu
A Low Power Implementation of H.264 Adaptive Deblocking Filter Algorithm
NASA/ESA Conference on Adaptive Hardware and Systems, August 2007, Edinburgh, Scotland, UK
(*This paper received Best Paper Prize in Adaptive and Reconfigurable Circuits for Multimedia Category*)

Video Processing and Compression Algorithm and Hardware Design

Zafer Tevfik Ozcan, Cagla Cakir, Mert Cetin, Ilker Hamzaoglu
An Overlapped Block Motion Compensation Hardware for Frame Rate Conversion
14th Euromicro Conference on Digital System Design, August 2011, Oulu, Finland

Abdulkadir Akin, Mert Cetin, Burak Erbagci, Ozgur Karakaya, Ilker Hamzaoglu
An Adaptive Bilateral Motion Estimation Algorithm and its Hardware Architecture
18th IFIP/IEEE International Conference on VLSI-SoC, September 2010, Madrid, Spain

Ozgur Tasdizen and Ilker Hamzaoglu
Computation Reduction Techniques for Vector Median Filtering and their Hardware Implementation
13th Euromicro Conference on Digital System Design, September 2010, Lille, France

Mert Cetin and Ilker Hamzaoglu
An Adaptive True Motion Estimation Algorithm for Frame Rate Conversion of High Definition Video
20th International Conference on Pattern Recognition, August 2010, Istanbul, Turkey

Ozgur Tasdizen and Ilker Hamzaoglu
Recursive Dynamically Variable Step Search Motion Estimation Algorithm for High Definition Video
20th International Conference on Pattern Recognition, August 2010, Istanbul, Turkey

Abdulkadir Akin, Gokhan Sayilar, Ilker Hamzaoglu
A Reconfigurable Hardware for One Bit Transform Based Multiple Reference Frame Motion Estimation
Design, Automation and Test in Europe (DATE) Conference, March 2010, Dresden, Germany

Abdulkadir Akin, Yigit Dogan, Ilker Hamzaoglu
A High Performance Hardware Architecture for One Bit Transform Based Motion Estimation
12th Euromicro Conference on Digital System Design, August 2009, Patras, Greece

Ozgur Tasdizen and Ilker Hamzaoglu
A Reconfigurable Frame Interpolation Hardware Architecture for High Definition Video
12th Euromicro Conference on Digital System Design, August 2009, Patras, Greece

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