

CURRICULUM VITAE

PERSONAL INFORMATION

- Name - **BROKALAKIS ANDREAS**
Address - **43 KAPODISTRIOU STR, CHANIA, CRETE, GREECE**
Telephone Number - **+30 6978113289 (cellphone)**
E-mail - **abrokalakis@ieee.org**
- Citizenship - Greek
Place and Date of Birth - Chania, Crete, Greece / November 11th, 1980

STUDIES

- 2013 – present - School of Electronic and Computer Engineering, Technical University of Crete
PhD Student
- 2004 - 2007 - Computer Engineering and Informatics Department, School of Engineering – University of Patras
Postgraduate Course : “Integrated Hardware / Software Systems”
M.Sc. Degree : 9.21 / 10 (First Honours – ranked 1st)
- 1998 - 2004 - Computer Engineering and Informatics Department, School of Engineering – University of Patras
Diploma Degree : 8.50 / 10 (First Honours)
- 1995 - 1998 - 3rd Lyceum, Chania, Crete, Greece
Final GPA : 19.2 / 20

FOREIGN LANGUAGES

- English - Proficiency in English, University of Cambridge
French - Certificat de Langue Francaise (DELF 1 : Unite A1, A2, A3, A4) , DELF 2 : Unite A5, A6

DISTINCTIONS – SCHOLARSHIPS

- Scholarship from EPEAEK II for my postgraduate studies
- 3rd Prize at the Web Design Competitions – Computer Engineering and Informatics Dept. 2003
- Member of the Parliament of Youth (2nd Summit) after distinction (ranked 1st) in the competition organized by the Hellenic Parliament
- Participated at the Euroscola program of the European Parliament after distinction at the relevant competition
- Distinctions at the competitions of the Hellenic Mathematic Society

PUBLICATIONS

(newest to oldest)

- 21 A. Brokalakis, A. Nikitakis, I. Papaefstathiou, N. Tampouratzis, St. Andrianakis, A. Dollas, M. Paracchini, M. Marcon, D.P. Pau, E. Plebani, “An Open-Source, Extendable, Highly-Accurate and Security-Aware Simulator for Cloud Applications”, to appear in 21st Conference on Innovation in Clouds, Internet and Networks (ICIN 2018), Paris, France, February 2018.
- 20 A. Brokalakis, I. Chondroulis, I. Papaefstathiou, “Extending the Forward Error Correction Paradigm for Multi-Hop Wireless Sensor Networks”, to appear in 9th International Conference on New Technologies, Mobility & Security (NTMS’2018), Paris, France, February 2018.
- 19 M. Rabozzi, R. Brondolin, G. Natale, E. Del Sozzo, M. Huebner, A. Brokalakis, C. Ciobanu, D. Strobandt, M. D. Santambrogio, “A CAD Open Platform for High Performance Reconfigurable Systems in the EXTRA Project”, IEEE Computer Society Annual Symposium on VLSI 2017 (ISVLSI2017), Bochum, Germany, July 2017.
- 18 N. Tampouratzis, A. Nikitakis, A. Brokalakis, St. Andrianakis, I. Papaefstathiou, A. Dollas, “An Open-Source Extendable, Highly-Accurate and Security Aware CPS Simulator”, International Conference on Distributed Computing in Sensor Systems 2017 (DCOSS2017), Ottawa, Canada, June 2017.
- 17 D. Strobandt, C. B. Ciobanu, M. D. Santambrogio, G. Figueiredo, A. Brokalakis, D. Pnevmatikatos, M. Huebner, T. Becker, A. J. W. Thom, “An open reconfigurable research platform as stepping stone to exascale high-performance computing”, Design, Automation & Test in Europe

2017 (DATE 2017), Lausanne, Switzerland, March 2017.

- 16 D.Stroobandt, A. L.Varbanescu, C. B. Ciobanu, M. Al Kadik, A. Brokalakis, G.Charitopoulos, T. Todman, X. Niu, D.Pnevmatikatos, A. Kulkarni, E.Vansteenkiste, W.Luk, M. D. Santambrogio, D.Sciuto, M. Huebner, T. Becker, G.Gaydadjiev, A.Nikitakis, A. J. W. Thom, "EXTRA: Towards the Exploitation of eXascale Technology for Reconfigurable Architectures", 11th International Symposium on Reconfigurable Communication-centric Systems-on-Chip (ReCoSoC 2016), Tallin, June 2016.
- 15 A. Kulkarni, E. Vansteenkiste, D.Stroobandt, A. Brokalakis, A. Nikitakis, "A fully parameterized Virtual Coarse Grained Reconfigurable Array for High Performance Computing Applications", 23rd Reconfigurable Architectures Workshop (RAW 2016), 2016 IEEE International Parallel and Distributed Processing Symposium Workshops, Chicago, May 2016.
- 14 C. B.Ciobanu , A. L.Varbanescu, D.Pnevmatikatos, G.Charitopoulos, X.Niu , W.Luk, M. D.Santambrogio , D.Sciuto, M. Al Kadi, M. Huebner, T. Becker, G. Gaydadjiev, A. Brokalakis, A.Nikitakis, A.J. W. Thom, E.Vansteenkiste, and D.Stroobandt, "EXTRA: Towards an Efficient Open Platform for Reconfigurable High Performance Computing", 18th IEEE International Conference on Computational Science and Engineering (CSE-2015), Porto, October 2015
- 13 D. Pnevmatikatos, K. Papadimitriou, T. Becker, P. Böhm, A. Brokalakis, K. Bruneel, C. Ciobanu, T. Davidson, G. Gaydadjiev, K. Heyse, W. Luk, X. Niu, I. Papaefstathiou, D. Pau, O. Pell, C. Pilato, M.D. Santambrogio, D. Sciuto, D. Stroobandt, T. Todman, E. Vansteenkiste, "FASTER: Facilitating Analysis and Synthesis Technologies for Effective Reconfiguration", Microprocessors and Microsystems: Embedded Hardware Design (MICPRO) Journal, Available online 6 November 2014, ISSN 0141-9331, <http://dx.doi.org/10.1016/j.micpro.2014.09.006>. (<http://www.sciencedirect.com/science/article/pii/S0141933114001409>)
- 12 F. Spada, A. Scolari, G.C. Durelli, R. Cattaneo, M.D. Santambrogio, D. Sciuto, D.N. Pnevmatikatos, G.N. Gaydadjiev, O. Pell, A. Brokalakis, W. Luk, D. Stroobandt, D. Pau, "FPGA-Based Design Using the FASTER Toolchain: The Case of STM Spear Development Board", 2014 IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA), Milan, Italy, August 2014
- 11 D. Pnevmatikatos, T. Becker, A. Brokalakis, G. Gaydadjiev, W. Luk, K. Papadimitriou, I. Papaefstathiou, O. Pell, C. Pilato, D. Pau, M. D. Santambrogio, D. Sciuto, D. Stroobandt, "Effective Reconfigurable Design: the FASTER Approach", Proc. 10th International Symposium on Applied Reconfigurable Computing (ARC), Vilamoura, Algarve, Portugal, April, 2014
- 10 Luciano Lavagno, Mihai Lazarescu, Ioannis Papaefstathiou, Andreas Brokalakis, Johan Walters, Bart Kienhuis, Florian Schaefer, "HEAP: a Highly Efficient Adaptive multi-Processor framework", Microprocessors and Microsystems: Embedded Hardware Design (MICPRO) Journal, vol. 37, issue 8, pages 1050 - 1062, 17 November 2013, ISSN 0141-9331
- 9 Dionisios Pnevmatikatos, Tobias Becker, Andreas Brokalakis, Karel Bruneel, Georgi Gaydadjiev, Wayne Luk, Kyprianos Papadimitriou, Ioannis Papaefstathiou, Oliver Pell, Christian Pilato, Mathieu Robart, Marco Santambrogio, Donatella Sciuto, Dirk Stroobandt and Tim Todman, "FASTER: Facilitating Analysis and Synthesis Technologies for Effective Reconfiguration", 15th Euromicro Conference on Digital System Design (DSD 2012), Izmir, Turkey, September 2012.
- 8 Luciano Lavagno, Mihai Lazarescu, Johan Walters, Bart Kienhuis, Ioannis Papaefstathiou, Andreas Brokalakis, Florian Schaefer, "HEAP: a Highly Efficient Adaptive multi-Processor framework", 15th Euromicro Conference on Digital System Design (DSD 2012), Izmir, Turkey, September 2012.
- 7 Andreas Brokalakis, Ioannis Papaefstathiou, "Using Hardware-Based Forward Error Correction to Reduce the Overall Energy Consumption of WSNs", 2012 IEEE Wireless Communications and Networking Conference (WCNC 2012), Paris, France, April 2012.
- 6 Konstantinos Papadopoulos, Andreas Brokalakis, Ioannis Papaefstathiou, "Increasing Resistance to Differential Power Analysis Attacks in Reconfigurable Systems", 16th IEEE Mediterranean Electrotechnical Conference (MELECON 2012), Medina Yasmine Hammamet, Tunisia, March 2012.
- 5 Georgios Chatziparaskevas, Andreas Brokalakis, Ioannis Papaefstathiou, "An FPGA-based Parallel Processor for Black-Scholes Option Pricing Using Finite Differences Schemes", Design, Automation and Test in Europe 2012 (DATE 2012), Dresden, March 2012.
- 4 Andreas Brokalakis, Vassilis Paliouras, "Using the Arithmetic Representation Properties of Data to Reduce the Area and Power Consumption of FFT Circuits for Wireless OFDM Systems", IEEE Workshop on Signal Processing Systems (SiPS2011), Beirut, October 2011.
- 3 Andreas Brokalakis, Georgios-Grigorios Mplemenos, Konstantinos Papadopoulos, Ioannis Papaefstathiou, "RESENSE: An Innovative, Reconfigurable, Powerful and Energy Efficient WSN Node", IEEE International Conference on Communications 2011 (ICC2011), Kyoto, Japan, June 2011.
- 2 Georgios-Grigorios Mplemenos, Konstantinos Papadopoulos, Andreas Brokalakis, Grigorios Chrysos, Euripides Sotiriades, Ioannis Papaefstathiou, "RESENSE: Reconfigurable WSN

nodes", Wireless Sensing Showcase 2009, London, July 2009.

- 1 [Andreas Brokalakis](#), Athanasios Kakarountas, Costas Goutis, "A High-Throughput Area Efficient FPGA Implementation of AES-128 Encryption", IEEE Workshop on Signal Processing Systems (SiPS2005), Athens, November 2005.

REVIEWER AT CONFERENCES/JOURNALS

- Reviewer for the Design, Automation and Test in Europe Conference 2017 (DATE 2017)
- Member of the Technical Program Committee of the IEEE AFRICON 2015 conference
- Reviewer for the IEEE International Symposium on Circuits and Systems 2013 (ISCAS 2013).
- Reviewer for the International Conference on Field Programmable Logic and Applications 2012 (FPL 2012)
- Reviewer for the IEEE Transactions on Wireless Communications
- Reviewer for the IEEE Transactions on Computers
- Reviewer at the Communication Theory Symposium of the IEEE Global Communications Conference 2010 (GLOBECOM 2010).

MASTER THESIS

- Title - *"Low-power VLSI Modem Architectures for Wireless OFDM Networks: the Role of Alternative Computer Arithmetic"*
- Supervisor - Prof. Paliouras Vassilis
- Work Outline - Study of the arithmetic behavior of data for a 64-point FFT for OFDM modems and devise of proper arithmetic representations based on BER performance in an OFDM receiver. Design of a radix-8 row-column 64-point FFT architecture using 2's complement arithmetic and hybrid 2's complement and Logarithmic Numbering System (LNS) arithmetic. Performance, area and power comparisons between implementations. Synthesis using Synopsys Design Compiler for a .18 μ m CMOS standard-cell library (UMC). Power measurement using ModelSim (switching activity) and Synopsys Power Compiler.

DIPLOMA THESIS

- Title - *"Design of A Dynamic Reconfigurable RISC Processor and Implementation on an FPGA"*
- Supervisor - Prof. Nikolos Dimitris
- Work Outline - Design of a 32-bit RISC Processor with a Dynamic Reconfigurable FPU. Implementation on a Xilinx Virtex FPGA. Development of an assembler to translate assembly code to machine code (in C). Development of Integer routines to simulate FP Instructions (in Assembly to be used internally in the processor). Development of a cycle accurate Processor Simulator (in C).

WORK EXPERIENCE

- March 2015 – present - Linux System Administrator for the servers of the Microprocessor and Hardware Laboratory (MHL) of Electronics and Computer Engineering School, Technical University of Crete
- June 2013 – present - Research Associate, Microprocessor and Hardware Laboratory (MHL), Electronics and Computer Engineering School, Technical University of Crete
- February 2010 - present - Senior Computer Engineer, Synelxis Solutions Ltd (<http://www.synelxis.com>)
European Union research projects:
September 2015 – today: H2020 EXTRA (Exploiting eXascale Technology with Reconfigurable Architectures), <https://www.extrahpc.eu/>
February 2015 - today: H2020 COSSIM (A Novel, Comprehensible, Ultra-Fast, Security-Aware CPS Simulator) - <http://www.cossim.org/>
September 2011 – January 2015: FP7 FASTER (Facilitating Analysis and Synthesis Technologies for Effective Reconfiguration) – <http://www.fp7-faster.eu>
February 2010 – March 2013: FP7 HEAP (Highly Efficient Adaptive multi-Processor framework) – <http://www.fp7-heap.eu>
- October 2008 – July 2014 - Research Engineer, Telecommunication Systems Institute (<http://www.tsi.gr>) / School of Electrical and Computer Engineering, Technical University of Crete
- October 2009 - Record of the wireless network at the area of the Municipality of Chania for the research project "Added-value Services Based on Position for wireless Broadband Networks", Institute for the Management of Information Systems of the Research and Innovation Centre in Information, Communication and Knowledge Technologies "Athena".

- June 2006 - Design and implementation of the personal website of the photographer Rainer Pawellek. (<http://perso.orange.fr/rainer.pawellek/>)
- Academic Year 2014-2015 / 2016-2017 - Lab Assistant for the course "Embedded Systems" (7th semester, School of Electronic and Computer Engineering, Technical University of Crete)
- Academic Year 2013-14 / 2016-17 / 2017-18 - Lab Assistant for the course "Computer Architecture" (8th semester, School of Electronic and Computer Engineering, Technical University of Crete)
- Academic Year 2000-2001 / 2004-2005 - Supervisor of the Computer Architecture Lab (3rd semester, Computer Engineering and Informatics Dept., University of Patras)
- Academic Year 2004-2005 - Supervisor of the Electronics Lab (3rd semester, Computer Engineering and Informatics Dept., University of Patras)

TECHNICAL SKILLS

Programming Languages	C/C++, Java, Assembly, SQL, nes-C
MarkUp Languages	HTML/CSS, XML, XSLT
Scripting Languages	Python, Javascript, PHP, bash/tcsh shell scripting
Hardware Description Languages	Verilog HDL, HLS
Technical Languages	Matlab, Maple
Operating Systems	MS-Windows, Solaris, Linux, RT-Linux (real time)
System Administration	Linux Server Administrator
Most Important Software Packages	MS Office / Visio / Visual Studio, Adobe DreamWeaver, gcc/gdb, MathWorks Matlab, Mentor Graphics ModelSim, Xilinx ISE / EDK / Vivado , Synopsys Design Compiler, Intel Parallel Studio

PROJECTS

These are the most important projects that I have completed and provide proof on my technical skills. Projects are separated in two groups, one for the ones completed during my under/post-graduate studies and one for the ones in my work.

Work Projects

- Wireless Sensor Networks / Hardware Design - Design of a Turbo Code Encoder for wireless sensor networks. Implementation on CrossBow (MICAz and IRIS) motes in software (nesC – TinyOS) and in hardware attached to those motes (on a Xilinx CPLD / Verilog HDL). Real-world energy measurements of the two implementations. This work was carried out for the EU-funded research project FP7 – Ad-Hoc PAN and Wireless Sensor Secure NETWORK (AWISSENET)
- Bluetooth Proximity Advertising - Programming of a Bluetooth Access Server for a Proximity Advertising application for Bluetooth-enabled cellphones. (embedded Linux, bash scripting, C).
- FPGA Hardware Design - Development of an FPGA accelerator for solving tridiagonal systems used in Option Pricing calculations (C/C++, Verilog, Xilinx Virtex-5/6FPGAs)
- Development of a reconfigurable (micro/dynamic partial) Network Intrusion Detection System (NIDS) for Gigabit Ethernet networks based on the Snort system. This work was carried out for the EU-funded research project FP7 – FASTER.
- Microprocessor System Design / Computer Architecture / Hardware Design - Development of a multi-core processor (4 / 8 / 16 / 24 cores) based on the Xilinx MicroBlaze microprocessors and implementation of custom cache coherency protocols based on snooping and VIPS schemes. This work was carried out for the EU-funded research project FP7 – HEAP.

Projects completed during my studies

- Hardware Design - Design of a voice CODEC based on CVSD algorithm with programmable settings. (Design Description : Verilog HDL / Synthesis : Leonardo Spectrum / Mapping Technology : Altera FLEX6K FPGA / Logic & Timing Simulations : ModelSim–verification in MATLAB)
- Gate-Level Design of Arithmetic Circuits for various Computer Arithmetic Systems (Sign-Magnitude, 2's Complement, LNS, RNS)
- Architectural design of various DSP systems.
- Implementation of a Scheduler for a 4x4 Router based on the FIRM Algorithm (Design Description: Verilog HDL. Synthesis: Leonardo Spectrum. Mapping Technology: Xilinx Spartan-IIFPGA. Logic / Timing Simulation: ModelSim)
- Computer Architecture - Optimization of the Implementations of the Cache Memory Model of the SimpleScalar Simulator to increase simulator's performance in cache-decay schemes (in C)
- Telecommunications - Implementation of a Forward Linear Predictor & Echo Canceller (inMATLAB)
- Simulations & Experimental Evaluation of a BaseBand Telecommunication System (PAM) (in MATLAB)
- Digital Signal Processing - Implementation of the Adaptive Filters LMS and RLS (in MATLAB)

	- System Modeling according to AR and MA, Evaluation of the Power Spectrum of a Stochastic Process (in MATLAB)
	- Implementation of Audio Effects (Echo, Reverb, Flanger, Chorus) (in MATLAB)
	- Voice signal Compression using Sub-Band Coding (in MATLAB)
Digital Image Processing	- Implementation of 2D FFT / 2D DCT Transformations, Image Restoration (Average – Median Filters), Homomorphic Filtering (using Butterworth first order filters), Inverse / Wiener Filters, Edge Detection (using Sobel operator), Total Histogram Equalization for Color Images (in RGB and HSV)(in MATLAB)
Network Programming	- Implementation of a File-Sharing Application using a central server (Peer-To-Peer Application – Development of the Central Server as well as the Client/Server applications) (in C, for Unix/Linux OSes)
	- Implementation of a Multithreaded Server (in C++, Linux, POSIX Threads)
Software Architecture	- Modeling of a QoS Manager for a real-time embedded system using UML.
Operating Systems	- Linux Shell Scripting, Virtual File System, implementation of new Signals and new System Calls
Data Structures	- Implementation of the algorithms InsertionSort, HeapSort, BubbleSort, QuickSort (inC)
	- Implementation of a B+ Tree Directory Structure (in C)
Neural Networks	- Implementation of a back-Propagation algorithm in a Multilayer Feed-Forward Neural Network (in MATLAB)
Compilers	- Implementation of an HTML parser (in C, using Flex and Bison)
Web Development	- Implementation of a Content Management System for a Web Directory for Companies (Server Side : Web Server : Apache, Data Base : MySQL, Server Side Scripting : PHP Client Side : HTML/CSS, XML/XSLT, Javascript)

SEMINARS

Title	- InTraLED – Training in Low Power Design, 4 th Course “ <i>Low Power Issues in VLSI Testing and Design for Testability</i> ” Instructors from University of Patras and IntracomS.A., Greece
Organizer	<i>University of Patras</i>
Dates	December 2004 - February 2005
Title	- InTraLED – Training in Low Power Design, 3 rd Course “ <i>System-Level Design for Low Power</i> ” Instructors from Politecnico di Torino and STMicroelectronics, Italy
Organizer	<i>University of Patras</i>
Dates	15 - 17November 2004
Title	InTraLED – Training in Low Power Design, 2 nd Course “ <i>Power Modelling and Estimation of Digital Circuits – Techniques and Tools</i> ” Instructors from OFFIS and ChipVision, Germany
Organizer	<i>University of Patras</i>
Dates	19 - 21October 2004
Title	- InTraLED – Training in Low Power Design, 1 st Course “ <i>Design of low-power digital circuits – Techniques and Tools</i> ” Instructors from Politecnico di Torino and BullDAST, Italy
Organizer	<i>University of Patras</i>
Dates	20 - 22 September 2004
Title	- JAVA Developer Day
Organizer	<i>Sun Microsystems</i>
Dates	17 January 2002 (during COMDEX 2002)

OTHER

- Professional Licenses
 - Member of the Hellenic Technical Chamber since March 2007
 - Member of the Institute of Electrical and Electronics Engineers (IEEE) - Circuits and Systems (CAS) Society, Computer (CS) Society and Communications (ComSoc) Society
- Army Service
 - Completed (August 2007 – August 2008, Technical Corpse, Telecommunications Technician)
- Music Studies
 - Music Theory (Harmony, Solfeze), Classic / Electric Guitar (Venizelio Conservatory of Chania)
- Photography
 - Photo/Travel blog: <http://www.croissantstories.com>
 - Participated in the following Group Photography Exhibitions:
 - *Photography Exhibition for the 50 Years Since the Establishment of the Samaria National Park*, Neorio of Moro, Chania Sailing Club, August- September 2012.
 - *Photography Festival "Fotoskiaseis 2012"*, Neorio of Moro, Chania Sailing Club, May 2012
 - *Group Photography Exhibition "Public Spaces"* – Neorio of Moro, Chania Sailing Club, June 2011
 - *Group Photography Exhibition*, Immigrants House of Chania, March 2010
 - *Fotoskiasis 2009*, Koundourou Villa, May 2009
 - *Photography Weekend*, School of Architecture, Technical University of Crete, June 2008
 - *Photography Festival*, Old Arsakeio of Patras, May 2007
 - *Artware Festival 2006*, Computer Engineering and Informatics Dept. – University of Patras,
 - Workshops :
 - participating under scholarship at the Documentary Project Photography WorkShop, [Maine Media Workshops](#) (instructor: [Stella Johnson](#)), Chania, May 2009.
 - Teaching Assistant, Documentary Project Photography WorkShop, [Maine Media Workshops](#) (instructor: [Stella Johnson](#)), Chania, May/June 2008.
- Driving Licenses
 - Motorcycle, car, motor boat