Cristian Ferent, PhD

cferent@yahoo.com
www.ece.sunysb.edu/~cferent/

SUMMARY

Highly motivated, team oriented, and focused PhD Electrical Engineer interested in novel electronic design automation techniques: linear and nonlinear circuit modeling methods, circuits and embedded systems optimization techniques, high performance circuit characterization, and circuit design employing data mining, knowledge representations, and pattern recognition methods.

PROFESSIONAL EXPERIENCE

VJ Technologies Inc. — Bohemia, NY
Electrical Engineer — 12/2013 – present

- Developed firmware, hardware, and Graphical User Interfaces for modern X-Ray generator controllers.
- Researched Automated Defect Recognition methods using pattern recognition and data mining techniques.
- Investigated next-generation X-Ray generator controller configurations based on Real Time Operating Systems and ARM-core microcontrollers.
- Performed computed tomography inspections of industrial parts using high performance X-Ray systems.
- Offered customer support for the company's line of Integrated X-Ray Sources.

Stony Brook University — Stony Brook, NY
Research Assistant — 09/2009 – 12/2013

- Developed symbolic circuit models for characterizing the advantages and limitations of analog designs.
- Designed, modeled, and characterized advanced BJT active loop filters for GHz frequency bandpass $\Delta\Sigma$ modulators in collaboration with Northrop Grumman Corporation.
- Devised techniques to automatically generate circuit comparison models for large sets of integrated analog amplifier circuits.
- Designed layouts and performed circuit sizing for integrated amplifier topologies in different CMOS and BiCMOS technologies.
- Studied and evaluated the uniqueness and variety of design topologies present in state-of-the-art circuits.
- Supervised graduate students working to develop advanced implementations of systematic integrated circuit comparison methodologies and algorithms.

Stony Brook University — Stony Brook, NY
Graduate Researcher — 09/2007 – 09/2009

- Designed the topology and layout of a low-power segmented current steering DAC for gas sensor arrays.
- Designed the structure and layout of a pipelined RISC microprocessor's data path.
- Implemented automated VLSI circuit partitioning and placement methods.
- Developed and verified a complete Verilog model of the SPU architecture (Cell processor, PlayStation 3).
- Worked on data aggregation methods for embedded systems applications.
- Devised robust algorithms for mapping communication paths onto networks of reconfigurable SoCs.
- Prototyped, debugged, and tested microcontroller-based embedded systems.

Stony Brook University — Stony Brook, NY
Teaching Assistant — 09/2007 – 09/2012
Department of Electrical and Computer Engineering

- Lectured, supervised and developed lab activities, held recitations, and graded for large undergraduate design courses, including: Embedded Microprocessor Systems Design, VLSI Systems Design, and Design using Programmable Mixed-Signal Systems-on-Chip.

Pro3Soft — Cluj-Napoca, Romania
Embedded Systems Engineer — 01/2007 – 07/2007

- Developed embedded software for flash drive applications.
- Completely designed, fabricated, and tested the PCB for a USB thumb drive.

PROFESSIONAL SKILLS

- Expert knowledge of circuit and system modeling techniques – symbolic, linear, and nonlinear methods.
- Circuit design experience, including layout of analog and digital cells.
- Experienced with Cadence Custom IC design framework – Virtuoso Suite, Spectre, HSpice.
- Extensive knowledge of CAD system administration and PDK integration.
- Hands on experience with Atmel, Cypress, Freescale, and Microchip PIC controllers and IDEs.
- Advanced knowledge of embedded communication interfaces, sensors, and peripheral devices.
- Proficient in Assembly, C/C++/C#, Java, Matlab/Simulink, Mathematica, Verilog, VHDL.
- Knowledge of X-Ray sources, generators, image acquisition and CT reconstruction software packages.
- UNIX and Windows systems expertise.

EDUCATION

Stony Brook University — Stony Brook, NY
Ph.D. in Electrical Engineering — 12/2013
- Dissertation: Systematic Modeling and Characterization of Analog Circuits using Symbolic and Data Mining Techniques

Stony Brook University — Stony Brook, NY
M.S. in Electrical Engineering — 12/2008

Technical University — Cluj-Napoca, Romania
B.S. in Telecommunications — 07/2007

WORK INTERESTS

- Heuristic optimization, hierarchical, knowledge-based, and simulation-based circuit synthesis methods.
- Automated macromodeling of integrated circuits and systems.
- Design knowledge representations, data mining, classification, and trade-off analysis applications.
- Predictable error modeling of data aggregation schemes in distributed embedded systems.

LANGUAGES

- English, Romanian: full professional proficiency.
- Hungarian: bilingual proficiency.
- German, French: basic proficiency.

PROFESSIONAL MEMBERSHIP/SERVICE

- Member of The IEEE.
- Reviewer for IEEE Transactions on Computer Aided Design of Circuits and Systems.
- Reviewer for Integration – The VLSI Journal (Elsevier).
- Reviewer for Journal of Circuits, Systems, and Computers.

PIER REVIEWED PUBLICATIONS

Journal Papers

- C. Ferent, A. Doboli, "Analog Circuit Design Space Description based on Ordered Clustering of Feature Uniqueness and Similarity", Integration – The VLSI Journal, 2014.
- C. Ferent, A. Doboli, "Symbolic Matching and Constraint Generation for Systematic Comparison of Analog Circuits", IEEE Trans. on Computer Aided Design of Integrated Circuits and Systems, 2013.
- C. Ferent, A. Doboli, "An Axiomatic Model for Concept Structure Description and Its Application to Circuit Design", Elsevier Journal on Knowledge-based Systems, 2013.
- C. Ferent, A. Doboli, "Measuring the Uniqueness and Variety of Analog Circuit Design Features", Integration – The VLSI Journal, 2011.

Book Chapters

- C. Ferent, A. Doboli, "Improving Design Feature Reuse in Analog Circuit Design through Topological-Symbolic Comparison and Entropy-based Classification" in "Analog/RF and Mixed-Signal Circuit Systematic Design", M. Fakhfakh, E. Tlelo-Cuautle, R. Castro-Lopez (Eds.), Springer, 2013.

Conference and Workshop Papers

- C. Ferent, A. Doboli, "Novel Circuit Topology Synthesis Method using Circuit Feature Mining and Symbolic Comparison", Design, Automation, and Test in Europe Conference, 2014.
- C. Ferent, A. Doboli, "Formal Representation of the Design Feature Variety in Analog Circuits", Design Automation Conference WIP, 2013.
- C. Ferent, A. Doboli, "Modeling the Analog Circuit Design Feature Variety", Forum on Specification and Design Languages, 2013.
- C. Ferent, A. Doboli, "A Prototype Framework for Conceptual Design of Novel Analog Circuits", International Conference on Synthesis, Modeling, Analysis, Simulation Methods and Applications to Circuit Design, 2012.
- C. Ferent, A. Doboli, "Systematic Comparison of Two Low-Voltage Amplifiers using Topology Matching and Performance Constraints", IEEE International NEWCAS Conference, 2012.
- C. Ferent, A. Doboli, "Systematic Comparison of Analog Circuits through Dual Topological-Symbolic Matching", Design Automation Conference WIP, 2012.
- C. Ferent, A. Doboli, "A Symbolic Technique for Automated Characterization of the Uniqueness and Similarity of Analog Circuit Design Features", Design, Automation, and Test in Europe Conference, 2011.
- C. Ferent, A. Doboli, "Towards Creative Analog Synthesis: A Symbolic Representation for Exploring Circuit Operation Principles", Frontiers in Analog Circuit Synthesis and Verification, 2011.
- C. Ferent, V. Subramanian, M. Gilberti, A. Doboli, "Linear Programming Approach for Performance-Driven Data Aggregation in Networks of Embedded Sensors", Design, Automation, and Test in Europe Conference, 2010.
- C. Ferent, M. Gilberti, A. Doboli, "Real-time Gas Cloud Detection by Data Aggregation in Networks of Embedded Sensors", IEEE International Systems Conference, 2010.
- C. Ferent, A. Doboli, "PNETMAP: Virtual Network Implementation on a Partially-known Physical Network", International Workshop on Dependable Network Computing and Mobile Systems, 2009.
- P. Sun, C. Ferent, M. Gilberti, A. Doboli, "Online AMS Frontend Reconfiguration for Sensor Networks Applications", European Conference on Circuit Theory and Design, 2009.
- C. Volosencu, D. Curiac, O. Banias, C. Ferent, D. Pescaru, A. Doboli, "Hierarchical Approach for Lighting Control in Future Urban Environments", IEEE - TTTC International Conference on Automation, Quality and Testing, Robotics, 2008.

PRESENTATIONS

- Formal Representation of the Design Feature Variety in Analog Circuits – Poster presentation at the Design Automation Conference, Austin, TX, 2013.
- A Prototype Framework for Conceptual Design of Novel Analog Circuits – Presentation at the International Conference on Synthesis, Modeling, Analysis, Simulation Methods and Applications to Circuit Design, Seville, Spain, 2012.
- HEALIX Kick-off Meeting – Presentation of the collaborative research efforts of Stony Brook University and Northrop Grumman Corporation, Stony Brook, NY, 2012.
- Data Mining Applications in Analog Circuit Synthesis – Lecture at Stony Brook University for the Pattern Recognition graduate level course, Stony Brook, NY, 2011.
- Towards Creative Analog Synthesis: A Symbolic Representation for Exploring Circuit Operation Principles – Presentation at the Frontiers in Analog Circuit Synthesis and Verification Workshop, Snowbird, UT, 2011.
- Linear Programming Approach for Performance-Driven Data Aggregation in Networks of Embedded Sensors – Presentation at the Design, Automation, and Test in Europe Conference, Dresden, Germany, 2010.

- PNETMAP: Virtual Network Implementation on a Partially-known Physical Network – Presentation at the International Workshop on Dependable Network Computing and Mobile Systems, Niagara Falls, NY, 2009.
- Designing with PSoC – Lecture at Hofstra University for the Mixed-Signal System-on-Chip Design course, Hempstead, NY, 2008.
- JAVA Programming Basics – Lecture at Hofstra University for the JAVA Programming Language course, Hempstead, NY, 2008.