Cristian Zambelli

CONTACT
INFORMATION

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OBJECTIVE

Placement in a post-doctoral or academic faculty research position

CITIZENSHIP

ITALY

RESEARCH
INTERESTS

Electrical Characterization of non-volatile memory devices, Reliability and Compact Modeling of electron devices, Physical simulation of memory cells and Architectural level techniques (μCs) exploiting memory reliability models

EDUCATION

Università degli Studi di Ferrara, Ferrara, ITALY

Dottorato di ricerca (Ph.D.), Engineering Science, started 2009 (ongoing)

- Thesis Topic: Characterization of Non-volatile memories for post floating-gate generation.
- Advisor: Prof. Piero Olivo
- Area of Study: Electrical and Reliability Characterization, Device Physics and Compact Modeling of non volatile memory devices. Architectural level techniques (μCs) exploiting memory reliability models for non volatile memory applications.

Laurea Specialistica degree (M.Sc.), Technologies for Telecommunications and Electronic Engineering, March 2008

- Thesis Topic: Electrical and Reliability Characterization of multi-megabit Phase Change Memory arrays
- Advisor: Dr. Andrea Chimenton
- Area of Study: Electrical and Reliability Characterization, Device Physics and Compact Modeling of Electron Devices

Laurea Triennale degree (B.Sc.), Telecommunications and Electronic Engineering, March 2006

- Thesis Topic: Development of a set of Sound Processing algorithms and effects within a MATLAB based framework
- Advisor: Dr. Davide Bertozzi
- Area of Study: Digital Systems Architectures and Signal Processing

SCIENTIFIC
FORMATION

Participation at "RIFLE and RIFLE SE ATEs System Architecture and SDK" training at ActiveTechnologies, Ferrara, ITALY, **October 2007**

Participation at "Application C35 Development" at N-Plus-T Semiconductor Center, for software driver development applied on non volatile memories by using RIFLE ATE system, Montecastrilli (TR), ITALY, **June 2008**

Participation at "IMST 2008 - EU Memory Tutorials" at IMEC MTC Center, Leuven, BELGIUM, **November 2008**

Participation at "IMST 2009 - EU Memory Tutorials" at RWTH Phyzikzentrum, Aachen, GERMANY, **September 2009**

AWARDS	Azienda Regionale Diritto allo Studio Univeristario (ARDSU) dell' Università degli Studi di Ferrara

Azienda Regionale Diritto allo Studio Univeristario (ARDSU) dell' Università degli Studi di Ferrara
- Annual Scholarship Grant 2003–2007

Comune di Copparo
- V.Zardi degree award 2006

Camera di Commercio Ferrara (CCIAA-FE)
- F.Viviani excellence award 2003

ACADEMIC EXPERIENCE

Università degli Studi di Ferrara, Ferrara, ITALY

Research Fellow   **April 2008 to December 2008**
- Research Topic: Reliability study of non volatile memories on automotive environment.

MINIMAT Commission member   **January 2008 to present**
- Commission member for entry-level math test for undergraduate information engineering (ING-INF classes) students.

Teaching Assistant   **January 2008 to present**
- Lab assistant and Instructor for Reliability of components, circuits and systems class
  - January 2008 (trimester)
  - Responsible for 2 hours lecture introducing to students the fundamentals of a dedicated ATE (Automated Test Equipment) for non-volatile Phase Change Memory testing
  - Laboratory supervisor for undergraduate students

- Instructor for Electron Devices class
  - April 2009
  - Responsible for 6 hours lecture teaching undergraduate students the technology for fabrication of silicon based and gallium arsenide based electron devices
  - Developed supplementary course material

- Instructor for Digital Electronic Systems class
  - September 2009
  - Responsible for 8 hours lectures teaching undergraduate students the technology of embedded microcontrollers units (both from architectural and physical point of view).
  - Developed supplementary course material

- Instructor for Digital Electronic class
  - September 2009 - March 2011
  - Responsible for 16 hours lectures teaching undergraduate students the fundamentals of digital and analog circuit simulation with OrCAD PSPICE.

Thesis advisor or co-advisor   **September 2008 to present**
- S.E. Iuculano, B.Sc. thesis in Telecommunications and Electronic Engineering, 2007-2008
- D. Dallagá, B.Sc. thesis in Telecommunications and Electronic Engineering, 2009-2010
- N. Bertoni, B.Sc. thesis in Telecommunications and Electronic Engineering, 2009-2010

PROFESSIONAL
EXPERIENCE

Application Note Developer for Infineon Technologies   **December 2006**
- Assigned to R&D department based in Padova, ITALY.
- Designed an application note for microcontrollers family XC166 (16 bit) with sound processing and infotainment features within an automotive environment
- Testing and Debugging of the application

Professional Engineer title and professional habilitation   **July 2008**
- Title conferred by Ordine degli Ingegneri di Bologna, ITALY.

European Project FP7-ATHENIS participation   **2008–2010**
- Work-package leader (WP9) for Reliability of Non Volatile Memory Technologies.
- Research topic: Automotive Tested high-voltage Embedded Non-volatile memory Integrated DoC.
- Characterization and Modeling of non volatile MEMS Nanomech memories. Comparative study with respect to a 0.35 μm traditional p-channel EEPROM technology. Driver developement for both devices using RIFLE SE ATE. Study and evaluation of both technologies reliability. Study of physical mechanisms during the information storage phase. In collaboration with AUSTRIAMICROSYSTEMS and CAVENDISH KINETICS.

Visiting researcher at AUSTRIAMICROSYSTEMS   **February 2009**
- Assigned to Reliability Testing Lab based in Unterpremstatten, AUSTRIA.
- Research topic: reliability characterization of a 0.35 μm EEPROM module on the framework of FP7 - ATHENIS project.

European Project FP7-GOSSAMMER participation   **2009–2010**
- Research topic: Gigascale Oriented Solid State flAsh Memory for EuRope
- Characterization and Modeling of non volatile NAND-TANOS and NAND-BE-TANOS. Study and evaluation of both technologies reliability. Study of physical mechanisms during the information storage phase. In collaboration with NUMONYX.

Formula Student V6 Technical Advisor   **2010**
- Project technical advisor of the electrical and electronic part of a student built racing kart for international university competition (Formula Student).

Visiting researcher at MASER Engineering   **September-October 2010**
- Assigned to Reliability Testing Lab based in Enschede, THE NETHERLANDS.
- Research topic: reliability characterization of a 0.35 μm NANOMECH nano-MEMS memory array module on the framework of FP7 - ATHENIS project.

Professional training at CIERRE-Elettrobi snc   **November-December 2010**
- Trainer at CIERRE-Elettrobi snc based in Serravalle (FE), ITALY.
- Responsible for 12 hours lectures on basis concepts of analog and digital circuits and systems.

SERVICES AND
SOCIETY
MEMBERSHIPS

Member, IU.NET consortium, 2008–2011

Graduate Student Member, IEEE, 2008–2011

Graduate Student Member and Reviewer, IEEE Electron Device Society, 2008–2011

Graduate Student Member, IEEE Reliability Society, 2008–2011

Graduate Student Member, IEEE Circuit and System Society, 2009–2011

Graduate Student Member, IEEE Solid-State Circuit Society, 2011

Member, MOS-AK/GSA Compact Modeling Group, 2010

Reviewer, IET Computers & Digital Techniques, 2010

Reviewer, Elsevier Micro Electronics Journal, 2010–2011

Reviewer, Elsevier Solid State Electronics Journal, 2010–2011

Reviewer, IEEE Embedded System Letters, 2010–2011

Reviewer, Elsevier Microelectronics Reliability, 2011

Member, JEDEC, 2011

Student Member, Associazione Italiana Gruppo Elettronica, 2011

Invited Seminars "Trends in Non-Volatile Memory Technologies", Politecnico di Torino, Torino (ITALY), 27 June 2011.

Journal Publications C.Zambelli, D.Bertozzi, A.Chimenton, and P.Olivo, "Non Volatile Memory Partitioning Scheme for Technology-based Performance-Reliability Trade-off", *IEEE Embedded System Letters*, vol.3, issue 1, pp. 13-15, 2011.

C.Zambelli, A.Chimenton, and P.Olivo, "Empirical investigation of SET Seasoning Effects in Phase Change Memory arrays", *Elsevier Solid State Electronics Journal*, vol.58, issue 1, pp. 23-27, 2011.

A.Chimenton, C.Zambelli, and P.Olivo, "A New Methodology for Two-Level Random Telegraph Noise Identification and Statistical Analysis", *IEEE Electron Device Letters*, vol.31, issue 6, pp. 612-614, 2010.

A.Chimenton, C.Zambelli, and P.Olivo, "A New Analytical Model of the Erasing Operation in Phase Change Memories", *IEEE Electron Device Letters*, vol. 31, issue 3, pp. 198-200, 2009.

Books chapters C.Zambelli, A.Chimenton, and P.Olivo, "Reliability of NAND Flash Memories" in *Inside NAND Flash Memories*, eds. R.Micheloni, L.Crippa, and A.Marelli, Springer, pp. 89-113, 2010.

CONFERENCE
PUBLICATIONS

C.Zambelli, P.Olivo, R.Gaddi, C.Schepens and C.Smith, "Characterization of a MEMS-based Embedded Non Volatile Memory array for Extreme Environments", *International Memory Workshop*, pp. 1-4, 2011.

R.Gaddi, C.Schepens, C.Zambelli, A.Chimenton and P.Olivo, "Reliability and Performance Characterization of a MEMS-based Non Volatile Switch", invited at *International Reliability Physics Symposium*, pp. 2G.2.1-2G.2.6, 2011.

C.Zambelli, A.Chimenton, and P.Olivo, "Analysis of Edge Wordline Disturb in Multimegabit Charge Trapping Flash NAND arrays", *International Reliability Physics Symposium*, pp. MY.4.1-MY.4.5, 2011.

C.Schepens, A.Chimenton, and C.Zambelli, "NVM technology for harsh environment", *1st International Congress - Automotive Electronics: driving the future of powertrain and electrification*, 2010.

A.Chimenton, C.Zambelli, and P.Olivo, "Experimental Characterization of Phase Change Memory arrays", invited paper in *International Symposium on Integrated Functionalities 2010*, 2010.

C.Zambelli, A.Chimenton, and P.Olivo, "Experimental Characterization of SET seasoning on Phase Change Memory arrays", *International Memory Workshop*, pp.29-32, 2010.

C.Zambelli, A.Chimenton, and P.Olivo, "Modeling of Seasoning Effects in Phase Change Memory arrays", *International MOS-AK/GSA Workshop*, 2010.

A.Chimenton, C.Zambelli, P.Olivo, F.P.Leisenberger, A.Wiesner, G.Schatzberger, E.Wachmann, and M.Schrems, "Evidence of Erratic behaviors in p-channel floating gate memories and a cell architectural solution", *Non-Volatile Memory Technology Symposium, 2009. NVMTS 2009. 10th Annual*, pp.63-66, 2009.

C.Zambelli, A.Chimenton, and P.Olivo, "Analysis and optimization of erasing waveform in phase change memory arrays", *Solid State Device Research Conference, 2009. ESSDERC '09. Proceedings of the European*, pp.213-216, 2009.

A.Chimenton, C.Zambelli, and P.Olivo, "A statistical model of erratic erase based on an automated random telegraph signal characterization technique", *Reliability Physics Symposium, 2009 IEEE International*, pp.896-901, 2009.

A.Chimenton, C.Zambelli, and P.Olivo, "A new automated methodology for random telegraph signal identification and characterization: a case study on phase change memory arrays", *Reliability Physics Symposium, 2009 IEEE International*, pp.128-133, 2009.

A.Chimenton, C.Zambelli, and P.Olivo, "Impact of short SET pulse sequence on electronic switching in Phase Change Memory arrays", *Non-Volatile Memory Technology Symposium, 2008. NVMTS 2008. 9th Annual*, pp.1-5, 2008.

A.Chimenton, C.Zambelli, P.Olivo, and A.Pirovano, "Set of Electrical Characteristic Parameters Suitable for Reliability Analysis of Multimegabit Phase Change Memory Arrays", *Non-Volatile Semiconductor Memory Workshop,2008 and 2008 International Conference on Memory Technology and Design, NVSMW/ICMTD 2008. Joint*, pp.49-51, 2008.

OTHER
PUBLICATIONS

C.Zambelli, A.Chimenton, and P.Olivo, "Reliability characterization of ATHENIS non volatile memory modules", presented at *ATHENIS dissemination workshop*, 2010.

A.Chimenton, P.Olivo, and C.Zambelli, "Reliability: statistical approach", presented at *Maratona delle Memorie conference*, 2010.

C.Zambelli and D.Bertozzi, "Performing Audio Processing by mean of XC161CJ/CS", Infineon Application Note Database, 2006.

REFERENCES

Available upon request