

Blaise Gassend

952 Holly St, San Carlos, CA. **Phone:** (650) 644-6341. **Email:** blaise.gassend@m4x.org

Education

PHD, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA.
Department of Electrical Engineering and Computer Science. Jun. 2007. GPA: 5.0/5
Research topic: A Microfabricated Planar Electrospray Thruster Array.
Minor: Optics.

MSC, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA.
Department of Electrical Engineering and Computer Science. Feb. 2003 GPA: 4.9/5
Research topic: Physical Random Functions.

DIPLÔME D'INGÉNIEUR, ECOLE POLYTECHNIQUE, Palaiseau, France.
Multidisciplinary training with major in Computer Science. Jun. 2001. GPA: 4.8/5

Relevant Experience

EXPONENT, 2007-

Technical Consulting: Working as an engineer for Exponent Failure Analysis Associates's Electrical and Semiconductor practice. Involved in failure analysis and litigation cases related to electrical engineering and computer science.

SPACE PROPULSION LABORATORY, 2005-2007

Microelectromechanical Systems: Designed, fabricated and tested silicon electrospray microthrusters for space applications. Main focuses include: assembly technology for the thruster electrodes (*patent pending*), kilovolt electrical insulation in a MEMS device, fabrication of silicon needle and ridge structures with complex geometries.

RESEARCH LABORATORY FOR ELECTRONICS, 2004-2005

Laser Technology: Designed and built a high-repetition rate, high power Ti:Sapph laser source. This laser was designed for use in a pioneering laser cooling method.

MIT COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE LABORATORY, 2001-2003 and Fall 2004

Protein Structure Prediction: I applied an SVM-based technique to learning a pseudo-energy model for protein secondary structure prediction.

Physical Random Functions: I co-invented Physical Random Functions (*patents pending*), a method to securely assign an identity to a chip, and conducted initial FPGA-based experiments. The *startup company Pufco, Inc.* was founded to commercialize this work.

Memory Integrity Verification: I helped apply existing memory integrity verification algorithms in the context of a high performance processor running on untrusted RAM. By using the trusted on-chip cache we were able to have a performance penalty of less than 25% when using hash trees.

ECOLE POLYTECHNIQUE ROBOT TEAM, 1999-2000

Team Coordinator: I coordinated my school's team for the E=M6 robotics competition. As coordinator, I was responsible for distributing tasks among team participants and ensuring that all the components would eventually work together. Our team ranked 9th out over 100 participating teams.

Motion Control: I developed a motion controller and position integrator, on the Ubicom SX microcontroller. This technology was successfully transferred to the following year's robot.

CLASS PROJECTS

Compiler for SX Microcontroller: (Spring 2001) As part of a two person team, I wrote an optimizing compiler for a C-like language for the SX Microcontroller.

FPGA Computer: (Fall 2000) As part of a two person team, I designed and implemented a video card, microprocessor and keyboard/mouse interface to run on an FPGA based PCI Pamette card, and wrote the corresponding compiler. We successfully prepared and presented our final presentation on the hardware we had made.

Circuit and Microcontroller simulator: (Spring 2000) As part of a two person team, I wrote XDust, an interactive simulator for circuits containing Scenix SX microcontrollers. I used this simulator to simulate the motion control aspects of our robot (see above).

Leadership	<p>PROCESS APPROVAL COMMITTEE (2006-2007): I was a member of MIT's Microsystems Technology Laboratories Process Technology Committee. This committee reviews processes that are to be carried out in the clean rooms to avoid contamination and safety risks. When processes do not meet the standards, we work with users to help them modify their process so that it can be approved.</p> <p>UNDERWATER HOCKEY (2005-2007): As leader of the MIT underwater hockey team I had arrange funding, recruit new members and organize practices. During my tenure, I have been able to negotiate lower rates for getting access to the athletics facility.</p> <p>UNDERGRADUATE SUPERVISION (2001-2006): Throughout graduate school, I supervised a number of MIT undergraduate students, helping to define their research goals, teaching them relevant skills, and guiding them on a day to day basis. With this coaching they were able to learn about research while contributing to our group's research.</p> <p>TEACHING (Spring 2003): Recitation instructor, introducing Mathematics to Computer Science students. Students reviews said that I successfully instilled excitement about the topic, covered the material and took the time to address their individual problems.</p> <p>SCIENCE CAMP (1998-2000): Counselor in science-oriented summer camps for teenagers. I organized and carried out both scientific and non-scientific activities.</p>
Skills	<p>COMPUTER: C, C++, OCaml, various Assembly Languages, Perl, Java, low-level programming. Mathematica, Maple. Unix (Linux) and Windows environments. Autocad, Solid Works. \LaTeX, Word, Excel, Powerpoint.</p> <p>ELECTRONICS: FPGA programming (Verilog), Microcontrollers, Digital Logic, basic Analog Filters, PCB design and fabrication, JTAG, ISO7816.</p> <p>LABORATORY: Silicon Processing (dry/wet etching, DRIE, photolithography, bonding), Optics, Machine Shop, Water Jet, Vacuum Technology, Laser Micromachining, GPIB programming, SEM, Cryogenics.</p> <p>TECHNICAL PRESENTATION: More than 15 technical publications, and ten conference presentations.</p> <p>LANGUAGES: Native English and French. Basic Spanish, interested in perfecting.</p>
Awards	<p>Best 90 Second MEMS Talk, MTL Annual Research Conference, Jan. 2007.</p> <p>Best 90 Second MEMS Talk, MTL Annual Research Conference, Jan. 2006.</p> <p>Robert Guenassia Fellowship, Jan. 2006.</p> <p>Outstanding Student Paper Award, 18th Annual Computer Security Applications Conference, Dec. 2002.</p> <p>Ecole Polytechnique Research Center Award, Dec. 2001.</p> <p>Best Ranked Team, Southwestern Europe ACM Programming Contest, Nov. 2000.</p>
Interests	<p>Linux Hacking, MIT Rocket Team, Space Elevator Dynamics, Reverse Engineering, SCUBA Diving, Underwater Hockey, Rollerblading, Ice Hockey, Board Games.</p>
Citizenship	<p>Canadian and French citizen. Currently in F1 Visa status with OPT expiring July 27th 2008.</p>
Selected Publications	<ol style="list-style-type: none"> [1] Blaise Gassend, Charles W. O'Donnell, William Thies, Andrew Lee, Marten van Dijk, and Srinivas Devadas. Predicting Secondary Structure of All-Helical Proteins Using Hidden Markov Support Vector Machines. In <i>Pattern Recognition in Bioinformatics</i>, number 4146 in LNCS, pages 93–104. Springer Berlin / Heidelberg, 2006. [2] Erik D. Demaine, Blaise Gassend, Joseph O'Rourke, and Godfried T. Toussaint. Polygons flip finitely: Flaws and a fix. In <i>Proceedings of the 18th Canadian Conference on Computational Geometry (CCCG 2006)</i>, pages 109–112, August 14–16 2006. [3] B. Gassend and L. F. Velasquez-Garcia and P. Lozano and A. I. Akinwande and M. Martinez-Sanchez. A Microfabricated Electro Spray Thruster using Ridge Emitters and Ceramic-Ball Extractor Location. In <i>Proceedings of the 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit</i>, July 2006. [4] Blaise Gassend, Dwaine Clarke, Marten van Dijk, and Srinivas Devadas. Controlled Physical Random Functions. In <i>Proc. of the 18th Annual Computer Security Conference</i>, December 2002. [5] Blaise Gassend. Non-equatorial uniform-stress space elevators. In <i>Proc. of the 3rd International Space Elevator Conference</i>, June 2004. [6] Blaise Gassend, Dwaine Clarke, G. Edward Suh, Marten van Dijk, and Srinivas Devadas. Caches and Hash Trees for Efficient Memory Integrity Verification. In <i>Proc. of the Ninth International Symposium on High Performance Computer Architecture (HPCA-9)</i>, February 2003.