

Curriculum Vitae

Jennifer M. Blain Christen
Electrical Engineering
Arizona State University
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Research Interests:

- bio-compatible integration techniques for CMOS electronics
- microfluidics and soft lithography
- 3D and non-traditional microfabrication techniques and devices
- post-processing and self-assembly of commercially fabricated structures
- MEMS devices with emphasis on bio-MEMS
- analog and mixed-mode VLSI for bio-medical/analytical instrumentation including SOS/SOI technologies

Education:

- 9/99-10/06 Johns Hopkins University, Baltimore, MD - Ph.D. Electrical Engineering
9/99-12/00 Johns Hopkins University, Baltimore, MD - M.S. Electrical Engineering
Coursework included: advanced analog and digital VLSI courses and seminars, solid state electronics, optoelectronics, medical microsystems, polymeric science, physical properties of materials, physical chemistry, MEMS
9/94-5/99 Johns Hopkins University, Baltimore, MD - B.S. Electrical Engineering
Coursework included: digital VLSI design, integrated electronics, electronic properties of materials, microfabrication laboratory
9/91-5/94 Illinois Mathematics and Science Academy, Aurora, IL

Awards:

- National Science Foundation Graduate Teaching Fellows in K-12 Education 2005-2006
- National Science Foundation Graduate Research Fellowship 2001-2004
- Grant Recipient for the Undergraduate Engineering Research Opportunities Program Sponsored by General Electric Faculty for the Future 1998
- Maryland Scholars Award 1997

Professional Experience:

Post-Doctoral Fellow

Johns Hopkins School of Medicine, Department of Immunogenetics, Baltimore, MD
November 2006-December 2007

Performed research on the design and fabrication of a microfluidic platform for homogeneous (single strand) HLA (human leukocyte antigen) allele detection.

This platform was designed for clinical use in matching solid organ and bone marrow donors and recipients.

Graduate Research Assistant

Johns Hopkins University, Electrical and Computer Engineering, Baltimore, MD
September 1999-October 2006

Performed research on several topics with an emphasis on microfabrication including: PDMS microfluidics, electro-fluidic interface, circuit design for 3D (stacked wafer) process, 3D integration of devices in PDMS, ultra low-power imager, microfabrication of MEMS devices

Undergraduate Research Assistant

Johns Hopkins University, Electrical and Computer Engineering, Baltimore, MD
May 1998-September 1999

Performed research on microfabrication of MEMS devices and microelectrode arrays for stimulation and recording

Collaborations:

Johns Hopkins School of Medicine, Department of Immunogenetics, Baltimore, MD
October 2005-present

Design and development of an integrated, disposable platform for DNA analysis, amplification and sequencing for clinical applications

Johns Hopkins School of Medicine, Department of Physiology, Baltimore, MD
January 2000-2003

Design and development of a MEMS device for high throughput screening of novel accessory proteins that modulate ion channels in mammalian cells

Johns Hopkins Applied Physics Laboratory, Space Department, Laurel, MD
January 2000-2001

Development of a micro-machined MISFET for single chip, multi-sensor system fabricated through post-processing release of structures using xenon difluoride etching

Teaching Experience:

Johns Hopkins University, Baltimore, MD
Spring Semester 07

Course Development and Instructional Staff. Developed original course work and laboratory protocols for the Advanced Topics in Fabrication and Microengineering course. Guided students in design, fabrication and testing of four original microfluidic devices of their own invention.

Johns Hopkins University, Baltimore, MD
Fall Semester 05 - 06

***What is Engineering?* Tutor.** Tutored students in preparation for the *What is Engineering?* course and assisted students with projects for the course

Johns Hopkins University, Baltimore, MD
Fall Semester 04 - 06

Research advisor for student projects. Developed student projects, assessed progress, assisted with problem-solving and supervised in-laboratory research. Student projects included:

- Self-Assembly Techniques for LED arrays: Senior Design Project (four students, one year)
- Self-Assembly Techniques in PDMS: Masters Project (one student, one year)
- Automated On-Chip PCR: Senior Design Project (two students, one year),
- Self-Assembly of Two Dimensional PDMS Arrays: Senior Design Project (four students, one semester)
- Self-Assembly with Low-Temperature Solder: Research Project (two students, one semester)

Johns Hopkins University, Baltimore, MD
Spring Semester 02

Teaching Assistant for Electronics Design Laboratory. Created projects for student groups, held weekly meeting for each group to assess progress and provide guidance, worked with students during testing phases of the projects.

Johns Hopkins University, Baltimore, MD
Fall Semester 99 - 02

Teaching Assistant for Microfabrication Laboratory. Developed coursework, weekly pre-lab lectures, taught laboratory sections, graded notebooks, homework, midterms, projects and reports, assisted and directed student group projects

Johns Hopkins University, Baltimore, MD
Fall Semester 98

Peer Tutoring Program. Met 2-3 times per week with students struggling in Integrated Electronics. Assisted students in conceptual understanding of course material, homework, and study skills techniques

Educational Outreach:

BIGSTEP (Broader Impact from Graduate Students Transferring Engineering Principles)

Johns Hopkins University Center for Educational Outreach, Baltimore, MD

Worked with faculty from the university and participating schools to develop and maintain programs to encourage student to pursue higher education in STEM fields

Inventors of the Future Program

Washington Mathematics Science Technology Public Charter High School
Washington D.C.

Organized event kick-off, reviewed student projects, worked with faculty to organize the program and judged the final presentations

Sensor Networks Project

Red Lake School, Red Lake, MN

Bimidji Middle School, Bimidji MN

Bugonaygeshig Tribal School, Leech Lake, MN

Baltimore Polytechnic School, Baltimore, MD

Worked with faculty to develop curriculum based on data obtained from Crossbow Motes deployed at each of the schools. Assisted in the development of complementary curriculum and programs for RCX units from the Lego Mindstorm kits.

Refereed Journal Publications:

Blain Christen, J.M., Andreou, A.G, "Integration of Silicon CMOS with Multilayer Silicone (PDMS) Fluidics into a Micro-Incubator for Cell Culture Studies", *IEEE Transactions on Biomedical Circuits and Systems, Invited Paper* – April 2007.

Winsor, R., Blain Christen, J.M., "An Optical Waveguide in a Silicon Wafer", *Journal of Applied Physics* (under review)

Refereed Conference Publications:

Blain Christen, J.M., Andreou, A.G, "Self-Biased Operational Transconductance Amplifier in 0.18 micron 3D SOI-CMOS", *2007 IEEE International Symposium on Circuits and Systems*, May 2007

Blain Christen, J.M., Iglehart, B., Andreou, A.G, "Localized Closed-Loop Temperature Control and Regulation in Hybrid Silicon/Silicon Life Science Microsystems", *2007 IEEE International Symposium on Circuits and Systems*, May 2007 – Student Paper Contest Honorable Mention

Blain Christen, J.M., Andreou, A.G, "Design, Analysis and Implementation of Integrated Micro-Thermal Control Systems", *2007 IEEE International Symposium on Circuits and Systems*, May 2007

Blain Christen, J.M., Andreou, A.G, "Hybrid Integration for Autonomous, Closed-loop Cell Culture and Incubation", *Proceedings of The Second Annual Meeting of American Academy of Nanomedicine*, September 2006

Blain Christen, J.M., Andreou, A.G, "Hybrid Silicon/Silicone (Polydimethylsiloxane) Microsystem for Cell Culture", *Proceedings of The 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, September 2006

Blain Christen, J.M., Andreou, A.G, "Integrated PDMS/CMOS Microsystem for Autonomous Incubation and Imaging in Cell Culture Studies", *Proceedings of the IEEE/NLM Life Science Systems and Applications (LSSA) Workshop 2006, NIH*, July 2006

Blain Christen, J.M., Andreou, A.G, "CMOS Heater Array for Incubation Environment Cellular Study", *Proceedings of the 48th Midwest Symposium on Circuit and Systems*, Volume 2, pp. 1786 - 1789, August 2005

Blain Christen, J.M., Davis, C.E., Min Li, Andreou, A.G. "Design, double sided post-processing, and packaging of CMOS compatible bio-MEMS device arrays", *IEEE*

International Symposium on Circuits and Systems, Volume: 1, 26-29, p. I-665 - I-668, 2002

Blain Christen, J.M.; Davis, C.E.; Min Li; Andreou, A.G., "Robust Polymeric Techniques for Design, Post-Processing and Packaging of Bio-MEMS Devices", *Proceedings from the 10th meeting of the Symposium on Polymers for Microelectronics*, p. 700-703, 2002

Goldberg, D.H., Pouliquen, P.O., Blain Christen, J.M., Culurciello, E., and Andreou, A.G. "Acoustic MEMS Integrated Sensor Arrays", *35th Annual Conference on Information Sciences and Systems*, 2001

Blain Christen, J.M., Davis, C.E., Li, M., Andreou, A.G., "Robust Techniques for Design, Post-Processing, and Packaging for CMOS-Based Bio-MEMS Arrays," *MEMS Alliance Fall 2001 Special Topics Symposium*, 2001

Professional and Educational Activities:

Institute for Electrical and Electronics Engineers

Chairperson, Robot Challenge Committee 1999-2001
Secretary, Johns Hopkins University Student Chapter 2000-2001
Chairperson, Johns Hopkins University Student Chapter 1998-1999
Secretary, Johns Hopkins University Student Chapter 1997-1999
Member, Baltimore Chapter 1996-2007
Member, Johns Hopkins University Student Chapter 1996-2006
Student Member 1996-present
IEEE Robot Challenge Mentor, Baltimore Chapter Spring 1999
IEEE Robot Challenge Volunteer, Baltimore Chapter Spring 1998

Electrochemical Society

Member, Nation's Capital Section 1999-2006
Student Member 1999-2006

Student Representative for the Department of Electrical and Computer Engineering

External Advisory Board, Research Presentation 2007
Graduate Research Fellowship Assessment Committee 2004
Dean Selection Committee 2004
Advisor to New Teaching Assistants
Internal Advisory Board 2000
Student Leadership Committee Chairperson 1999-2000
Student Leadership Committee Departmental Review Co-Chair 1999-2000
ABET 1998-2000
External Advisory Board 1997-2000
Society of Engineering Alumni Career Night - Invited Panelist 2001

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Citizenship: United States of America, Born: Watseka, Illinois