Jeffrey A. Weldon

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Department of Electrical Engineering *jaweldon@.hawaii.edu*
University of Hawaii at Manoa *Associate Professor*
Honolulu, HI 96822

EDUCATION

Ph.D. in Electrical Engineering
University of California, Berkeley, December 2005
Advisor: Paul R. Gray
Area: CMOS RF Circuits and Systems

BS in Engineering Physics
University of California, Berkeley, December 1992

EXPERIENCE

10/17 – present **University of Hawaii at Manoa** – Associate Professor of Electrical Engineering.

8/17 – present **Carnegie Mellon University** – Adjunct Professor of Electrical and Computer Engineering.

7/16 – 8/17 **Carnegie Mellon University** – Associate Professor of Electrical and Computer Engineering.

8/11 – 6/16 **Carnegie Mellon University** – Assistant Professor of Electrical and Computer Engineering.

8/10 – 7/11 **University of California, San Francisco –** Electrical Engineer.
Contribute to the design and implementation of medical devices for *ex-vivo* and *in-vivo* applications with a multidisciplinary team.

6/06 – 9/10 **University of California, Berkeley** – Postdoctoral Scholar in Center for Integrated Nano-Mechanical Systems (COINS).
Supervisor: Alex K. Zettl
Investigated the use of nanoscale devices for applications such as radios, sensors, oscillators, power generation and adhesives primarily using carbon nanotubes. Responsible for personal research and advising both graduate and undergraduate students in the Department of Physics.

6/06 – 3/07 **Dust Networks**, Consultant.
Designed a high-efficiency power amplifier for moderate output power levels used in wireless sensor network applications.

08/00 – 12/00 **University of California, Berkeley**, EECS Department, Graduate Student Instructor.
Instructor: Kristofer Pister.
Primary teaching assistant for an upper division undergraduate course (EECS 140) on analog integrated circuits. Responsible for leading weekly discussion sections, holding office hours, grading and assisted in designing exams, semester projects and homework assignments.

8/93 – 5/01 **University of California, Berkeley,** EECS Department, Graduate Student Researcher.
Primary Investigator: Paul R. Gray
Researched solutions at both the circuit and architectural levels that allowed for the integration of high-performance cellular transceivers on a single CMOS integrated circuit. Primary responsibilities included the transmitter architecture and circuit design of the mixers. Managed a team of eight graduate students and visiting scholars who contributed to the transmitter research. Contributed to research proposals submitted to National Science Foundation and the Defense Advanced Research Projects Agency (DARPA).

5/92 – 8/92 **SanDisk Corporation**, Intern.
Investigated breakdown effects in flash memory devices.

PUBLICATIONS

Book Chapters:

E. Ozalp, S. Kim, V. Sundar, J. Zhu, **J. A. Weldon**, "Fabrication of Conductive Nanoporous Membranes using Self-Assembling Block Copolymers for Smart Drug Delivery", *The Encyclopedia of Nanoscience and Nanotechnology, 3rd Edition,* 2017, in press.

J. Weldon, T. Yuzvinsky, and A. Zettl, "Nanoscale Mechanics for Medicine, Nanomedicine Design of Particles, Sensors, Motors, Implants, Robots, and Devices," Chatper 16, Artech House, 2009.

Ph.D. Thesis:

J.A. Weldon, "High Performance CMOS Transmitters for Wireless Communications," Ph.D. Thesis, University of California, Berkeley, 2005.

Journal Papers:

K. Warren, K. Justus, E. Ozalp, **J. Weldon**, C. F. Higgs III, P. LeDuc, "Tunable disruption of artificial cells using a wind-inspired microfluidic approach," *Nature Chemical Biology*, 2017, under review.

T. Jackson, R. Shi, A. Sharma, J. Bain, **J. Weldon**, L. Pileggi, "Implementing delay insensitive oscillatory neural networks using CMOS and emerging technology," *Analog Integrated Circuits and Signal Processing*, 2016.

M. Darwish, V. Calayir, L. Pileggi, **J. Weldon**, "Ultra-Compact Graphene Multigate Variable Resistor for Neuromorphic Computing", *IEEE Transactions on Nanotechnology*, 2016.

M. Darwish, M. Mohsen, A. Saad, **J. A. Weldon**, "Sub 1 uA Ultra-Low Area Asynchronous Switching Regulator," *IEEE Transactions on Circuits and Systems II*, 2016.

W. Li, **J. A. Weldon**, Y. Huang, K. Wang, "Design and Simulation of Piezoelectric-Charge Gated Thin-Film Transistor for Tactile Sensing," *IEEE Electron Device Letters*, 2016.

S. Kim, E. I. Ozalp, V. Sundar, J. Zhu, **J. A. Weldon**, "Modeling of Electrically Controlled Molecular Diffusion in a Nanofluidic Channel," *Journal of Applied Physics*, 2015.

A. A. Sharma, Y. Li, M. Skowronski, J. A. Bain, **J. A. Weldon**, "High-Frequency TaOx-based Compact Oscillators," *IEEE Transactions on Electron Devices*, 2015.

R. Liu, L. Pileggi, **J. Weldon**, "A Wideband RF Receiver With >80 dB Harmonic Rejection Ratio," *Integration, The VLSI Journal*, 2014.

A. Sharma, J. Bain, **J. Weldon**, "Phase Coupling and Control of Oxide-based Oscillators for Neuromorphic Computing", *IEEE Journal on Exploratory Solid-State Computational Devices and Circuits*, 2015.

T. Jackson, A. Sharma, J. Bain, **J. Weldon**, L. Pileggi, "Oscillatory Neural Networks based on TMO Nano-Oscillators and Multi-Level RRAM Cells," *IEEE Journal On Emerging And Selected Topics In Circuits And Systems*, 2015.

J. Weldon, B. Aleman, A. Sussman, W. Gannett, and A. Zettl, "Sustained Mechanical Self-Oscillations in Carbon Nanotubes," *Nano Letters*, Vol. 10 no. 5, pp 1728–1733, May 2010.

J. Weldon, K. Jensen, A. Zettl, "Nanomechanical Radio Transmitter," *Physica Status Solidi (b)*, vol. 245, no.10, pp. 2323-2325, October 2008

K. Jensen, **J. Weldon**, H. Garcia and A. Zettl, "Nanotube Radio," *Nano Letters*, vol. 7, no. 11, pp. 3508-3511, October 2007.

J.A. Weldon, R. Narayanaswami, J. Rudell, L. Lin, M. Otsuka, S. Dedieu, L. Tee, K. Tsai, C. Lee, and P. Gray, "A 1.75-GHz Highly Integrated Narrow-band CMOS Transmitter with Harmonic-Rejection Mixers," *IEEE Journal of Solid-State Circuits*, vol. 36, pp. 2003-2015, December 2001.

J. Rudell, J. Ou, T. Cho, G. Chien, F. Brianti, **J. Weldon** and P. Gray. "A 1.9 GHz Wide-Band IF Double Conversion CMOS Receiver for Cordless Telephone Applications," *IEEE Journal of Solid-State Circuits*, December, 1997.

Refereed Conference Papers:

M. Darwish, D. Saha, J. Malen, **J. Weldon**, "A Comparison of the Impact of Metal-Ion Containing and Metal-Ion Free Photoresist Developers on Graphene Field-Effect Transistors," *IEEE International Conference on Nanotechnology*, 2017.

Y. Kesim, D. Gala, J. Bain, **J. Weldon**, "Phase Based Boolean Computation Using GeTe6 Oscillators," *IEEE International Conference on Nanotechnology*, 2017.

S. Kim, E. Ozalp, M. Darwish, **J. A. Weldon**, "Electrically Gated Nanoporous Membranes," *IEEE NEMS 2017- IEEE International Conference on Nano/Micro Engineered and Molecular Systems*, 2017.

M. Darwish, D. Saha, J. Malen, **J. Weldon**, "Processing-Induced Strain in dual-gated Graphene FETs," *IEEE International Conference on Nanotechnology*, 2017.

D. Saha, X. Yu, M. Darwish, M. Jeong, J. Freedman, A. Gellman, **J. Weldon**, J. Malen, "Developing Superior Alloy Contacts Optimized for Electrical and Thermal Transport at Metal-Graphene Interfaces", *MRS Spring Meeting*, April 2017.

A.A. Sharma, Y. Kesim, M. Shulaker, C. Kuo, C. Augustine, H.-S.P Wong, S. Mitra, M. Skowronski, J.A. Bain, **J.A. Weldon**, "Low-Power, High-Performance S-NDR Oscillators for Stereo (3D) Vision using Directly-Coupled Oscillator Networks," *Symposia on VLSI Technology and Circuits*, 2016.

R. Liu, **J. Weldon**, L. Pileggi, "Extended Statistical Element Selection: A Calibration Method for High Resolution in Analog/RF Designs," *Design Automation Conference*, 2016.

E. Ozalp, S. Kim, V. Sundar, J. Zhu, **J. A. Weldon**, “Fabrication of Conductive Nanoporous Membranes using Self-Assembling Block Copolymers for Electrically Controlled Diffusive Flow,” *Nanotech 2016 Conference & Expo*, 2016.

M. Boring, S. Kelly, **J. A.Weldon**, M. Tarr, A. Robinson, M. Behrmann, and P. Grover, "Containing errors in computation for neural sensing: does a hierarchical referencing strategy lead to energy savings?," *Proceedings of the 2016 Workshop on Information Theory and its Applications (ITA)*, San Diego, CA, 2016.

A. A. Sharma, Y. Kesim, J. A. Bain, M. Skowronski, **J. A. Weldon**, “Experimental Demonstration and Modeling of GeTe6 Oscillators and Threshold Switches for Emerging Architectures and Memory”, *International Conference on Solid State Materials and Devices*, Sapporo, Japan, 2015.

P. Grover, **J. A. Weldon**, S. Kelly, P. Venkatesh, H. Jeong. "Achieving Information Capacity of EEG-Based Brain Computer Interfaces Using High-Density EEG Sensing," *Annual Allerton Conference on Communication, Control, and Computing*, 2015.

A. A. Sharma, M. Skowronski, J. A. Bain, **J. A. Weldon**, “Novel CMOS-Compatible a-Si based Oscillator and Threshold Switch,” *European Solid-State Device Conference*, 2015.

W. Li, **J. A. Weldon**, K. Wang, “Analytical Modeling of Piezoelectric Charge Gated Thin Film Transistor for Force Sensing and Energy Harvesting,” *IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, 2015

T. Jackson, A. Sharma, J. Bain, **J. Weldon**, L. Pileggi, "An RRAM-Based Oscillatory Neural Network," *Latin American Symposium of Circuits and Systems*, 2015.

A.A. Sharma, T.C. Jackson, M. Shulaker, C. Kuo, C. Augustine, J.A. Bain, H.-S.P Wong, S. Mitra, L.T. Pileggi, **J.A. Weldon**, “High Performance, Integrated 1T1R Oxide-based Oscillator – Stack Engineering for Low-Power Operation in Neural Network Applications,” *Symposia on VLSI Technology and Circuits*, 2015.

V.Calayir, M. Darwish, **J. Weldon**, L. Pileggi, “Analog Neuromorphic Computing Enabled by Multi-Gate Programmable Resistive Devices”, *Design Automation Test Europe 2015*, 2015.

J. A. Weldon, J. Rudell, L. Lin, R. Narayanaswami, M. Otsuka, S. Dedieu, L. Tee, K. Tsai, C. Lee and P. Gray “A 1.75-GHz Highly-Integrated Narrow-Band CMOS Transmitter with Harmonic-Rejection Mixers,” IEEE

International Solid-State Circuits Conference, February, 2001.

R. Liu, L. Pileggi, **J. A. Weldon**, "A Wideband RF Receiver With >80 dB Harmonic Rejection Ratio," *IEEE Custom Integrated Circuits Conference. 2014*.

J. Rudell, JJ. Ou, T. Cho, G. Chien, F. Brianti, **J. Weldon**, and P. Gray. "A 1.9 GHz Wide-Band IF Double Conversion CMOS Integrated Receiver for Cordless Telephone Applications," *IEEE International Solid-State Circuits Conference*, February, 1997.

Other Papers:

H. Jeong, M. Won, W. Shi, **J. A. Weldon**, X. Li, and K. Wang, "Feasibility Study of a Dual-gate Photosensitive Thin-Film Transistor for Fingerprint Sensor Integrated Active-Matrix Display," *Society for Information Display International Symposium*, 2015.

J.C. Rudell, **J.A. Weldon**, JJ. Ou, L. Lin and P.R. Gray "An Integrated GSM/DECT Receiver: Design Specifications," *UCB Electronics Research Laboratory Memorandum*, Memo #: UCB/ERL M97/82.

J.C. Rudell, J.J. Ou, R. S. Narayanaswami, G. Chien, **J.A. Weldon**, L. Lin, K. Tsai, L. Tee, K. Khoo, D. Au, T. Robinson, D. Gerna, M. Otsuka, and P. R. Gray "Recent Developments in High Integration Multi-Standard CMOS Transceivers for Personal Communication Systems," *International Symposium on Low Power Electronics*, Monterey California, August 1998

P. Gray, T. Cho, JJ. Ou, T. Weigandt, J. Rudell, F. Brianti, S. Lo, S. Mehta G. Chien and **J. A. Weldon**, "High-Integration CMOS RF Transceivers," *Workshop on Advances in Analog Circuit Design*, Lausanne, Switzerland, April 1996.

PATENTS

"Nanotube Resonator Devices", K. J. Jensen, A. Zettl, & J. A. Weldon. PCT/US2008/075125, WO 2009/048695 September 3, 2008.

"Physically Unclonable Functions using Neurormorphic Networks," T. Jackson, A. Sharma, J. Weldon, L. Pileggi, U.S. Provisional Patent Application.

"Compact Resistive Digital-to-Analog Converter using Graphene," M. Darwish, L. Pileggi, J. Weldon, U.S. Provisional Patent Application.

HONORS

Sathaye Early Career Professorship, July 2016.

Recipient of the Lewis Winner Award for Outstanding Paper at the 2001 International Solid-State Circuits conference, February 2002.

Recipient of the Jack Kilby Outstanding Student Paper Award at the 1997 International Solid-State Circuits conference, February 1998.

Three-time NCAA Water Polo Champion: 1990, 1991, and 1992.

Two-time Water Polo Scholar Athlete of the Year.

PROFESSIONAL SERVICE

Program Committee for International Solid-State Circuits Conference Student Research Preview Committee, 2012-2017

NSF proposal review for Electronics, Photonics and Magnetic Devices (EPMD)

Journal reviewer: : IEEE Journal of Solid-State Circuits, IEEE Journal on Exploratory Solid-State Computational Devices, IEEE Transactions on Electronic Devices, IEEE Transactions on Circuits and Systems, Biomedical Microdevices, Journal of Emerging Technologies in Computing Systems, IET Circuits, Devices and Systems