

Stanford



Boris Murmann

Professor of Electrical Engineering

CONTACT INFORMATION

- **Administrative Contact**

Douglas Chaffee

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Bio

BIO

Boris Murmann is a Professor of Electrical Engineering at Stanford University. He joined Stanford in 2004 after completing his Ph.D. degree in electrical engineering at the University of California, Berkeley in 2003. From 1994 to 1997, he was with Neutron Microelectronics, Germany, where he developed low-power and smart-power ASICs in automotive CMOS technology. Since 2004, he has worked as a consultant with numerous Silicon Valley companies. Dr. Murmann's research interests are in mixed-signal integrated circuit design, with special emphasis on sensor interfaces, data converters and custom circuits for machine learning. In 2008, he was a co-recipient of the Best Student Paper Award at the VLSI Circuits Symposium and a recipient of the Best Invited Paper Award at the IEEE Custom Integrated Circuits Conference (CICC). He received the Agilent Early Career Professor Award in 2009 and the Friedrich Wilhelm Bessel Research Award in 2012. He has served as an Associate Editor of the IEEE Journal of Solid-State Circuits, as well as the Data Converter Subcommittee Chair and the Technical Program Chair of the IEEE International Solid-State Circuits Conference (ISSCC). He is the founding faculty co-director of the Stanford SystemX Alliance and the faculty director of Stanford's System Prototyping Facility (SPF). He is a Fellow of the IEEE.

ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- University Researcher Award for lifetime research contributions to the US semiconductor industry, Semiconductor Industry Association & Semiconductor Research Corporation (2021)
- Fellow, IEEE (2015)
- Friedrich Wilhelm Bessel Research Award, Alexander von Humboldt Foundation (2012)
- Distinguished Lecturer, IEEE Solid-State Circuits Society (2011-2012)
- Sony Faculty Scholar, Stanford University (2010)
- Early Career Professor Award, Agilent Technologies (2009)
- Best Invited Paper Award, IEEE CICC (2008)
- Best Student Paper Award, IEEE VLSI Circuit Symposium (2008)

- Outstanding Special-Topic Evening Award, International Solid-State Circuits Conference (ISSCC) (2008)
- Meritorious Paper Award, Government Microcircuit & Critical Technology Conference (2005)
- Robert N. Noyce Faculty Scholar, Stanford University (2004-2005)

PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

PROFESSIONAL EDUCATION

- PhD, UC Berkeley (2003)

LINKS

- Google scholar: <http://scholar.google.com/citations?user=AZkVOeAAAAAJ&hl=en>
- Research web page: https://murmnn-group.stanford.edu/mediawiki/index.php/Main_Page

Teaching

COURSES

2021-22

- SystemX: Ubiquitous Sensing, Computing and Communication Seminar: EE 310 (Spr)

2020-21

- Advanced Integrated Circuit Design: EE 214B (Win)
- Analog-Digital Interface Circuits: EE 315 (Aut)
- Circuits II: EE 101B (Spr)

2019-20

- Advanced Integrated Circuit Design: EE 214B (Win)
- Circuits II: EE 101B (Spr)

2018-19

- Advanced Integrated Circuit Design: EE 214B (Win)
- Circuits II: EE 101B (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Weston Braun, Nicolo Maganzini, Zachary Myers, Yuya Nishio, Rafael Perez Martinez, Nikhil Poole, Ahmed Sawaby, Ajay Singhvi, Ernest So, Pulkit Tandon, Lyne Tchammi P., Max Wang, Eric Wu

Orals Chair

Anirudh Prabhu

Postdoctoral Faculty Sponsor

Moon Hyung Jang, Thanos Ramkaj

Doctoral Dissertation Advisor (AC)

Rohan Doshi, Massimo Giordano, Qianyun Lu, Gift Nyikayaramba, Luke Sammarone, Luke Upton, Nicholas Vitale, Stephen Weinreich, Pumiiao Yan

Master's Program Advisor

Masa Someha

Doctoral (Program)

Massimo Giordano, Qianyun Lu, Aya Mouallem, Luke Sammarone, Stephen Weinreich

Publications

PUBLICATIONS

- **Fair and Comprehensive Benchmarking of Machine Learning Processing Chips** *IEEE DESIGN & TEST*
Burr, G. W., Lim, S., Murmann, B., Venkatesan, R., Verhelst, M.
2022; 39 (3): 18-27
- **CHIMERA: A 0.92-TOPS, 2.2-TOPS/W Edge AI Accelerator With 2-MByte On-Chip Foundry Resistive RAM for Efficient Training and Inference** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Prabhu, K., Gural, A., Khan, Z. F., Radway, R. M., Giordano, M., Koul, K., Doshi, R., Kustin, J. W., Liu, T., Lopes, G. B., Turbiner, V., Khwa, W., Chih, et al
2022
- **Analog and Mixed-Signal Layout Automation Using Digital Place-and-Route Tools** *IEEE TRANSACTIONS ON VERY LARGE SCALE INTEGRATION (VLSI) SYSTEMS*
Wei, P., Murmann, B.
2021; 29 (11): 1838-1849
- **Accelerated Electron Transfer in Nanostructured Electrodes Improves the Sensitivity of Electrochemical Biosensors.** *Advanced science (Weinheim, Baden-Wurtemberg, Germany)*
Fu, K., Seo, J., Kesler, V., Maganzini, N., Wilson, B. D., Eisenstein, M., Murmann, B., Soh, H. T.
2021: e2102495
- **A 2x Time-Interleaved 28-GS/s 8-Bit 0.03-mm(2) Switched-Capacitor DAC in 16-nm FinFET CMOS** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Caragiulo, P., Mattia, O., Arbabian, A., Murmann, B.
2021; 56 (8): 2335-2346
- **Single-chip mixer-based subarray beamformer for sub-Nyquist sampling in ultrasound imaging** *JAPANESE JOURNAL OF APPLIED PHYSICS*
Kanemoto, D., Spaulding, J., Murmann, B.
2021; 60 (SB)
- **An 800 nW Switched-Capacitor Feature Extraction Filterbank for Sound Classification** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Villamizar, D., Muratore, D., Wieser, J. B., Murmann, B.
2021; 68 (4): 1578-88
- **A 7-bit 2 GS/s Time-Interleaved SAR ADC With Timing Skew Calibration Based on Current Integrating Sampler** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Jiang, W., Zhu, Y., Chan, C., Murmann, B., Martins, R.
2021; 68 (2): 557-68
- **Mixed-Signal Computing for Deep Neural Network Inference** *IEEE TRANSACTIONS ON VERY LARGE SCALE INTEGRATION (VLSI) SYSTEMS*
Murmann, B.
2021; 29 (1): 3-13
- **TinyML: Current Progress, Research Challenges, and Future Roadmap**
Shafique, M., Theocharides, T., Reddy, V., Murmann, B., IEEE
IEEE.2021: 1303-1306
- **A 4-bit Mixed-Signal MAC Array with Swing Enhancement and Local Kernel Memory**
Yu, W., Giordano, M., Doshi, R., Zhang, M., Mak, P., Martins, R. P., Murmann, B., IEEE
IEEE.2021: 326-329
- **Best Practices to Quantify Linearity Performance of GaN HEMTs for Power Amplifier Applications**
Martinez, R., Munzer, D. J., Zhou, X., Shankar, B., Schmidt, E., Wildnauer, K., Wu, B., Murmann, B., Chowdhury, S., IEEE

IEEE.2021: 85-89

- **Going beyond the Debye Length: Overcoming Charge Screening Limitations in Next-Generation Bioelectronic Sensors.** *ACS nano*
Kesler, V., Murmann, B., Soh, H. T.
2020
- **Stability of Gated Recurrent Unit Neural Networks: Convex Combination Formulation Approach** *JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS*
Stipanovic, D. M., Kapetina, M. N., Rapaic, M. R., Murmann, B.
2020
- **Power-saving design opportunities for wireless intracortical brain-computer interfaces.** *Nature biomedical engineering*
Even-Chen, N., Muratore, D. G., Stavisky, S. D., Hochberg, L. R., Henderson, J. M., Murmann, B., Shenoy, K. V.
2020
- **S-Parameter-Based Defect Localization for Ultrasonic Guided Wave SHM** *AEROSPACE*
Nyikayaramba, G., Murmann, B.
2020; 7 (3)
- **Distortion Analysis of RC Integrators With Wideband Input Signals** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Hammler, N., Murmann, B.
2020; 67 (1): 12–22
- **Design Considerations for External Compensation Approaches to OLED Display Degradation**
Kwon, J., Lee, C., Chae, Y., Murmann, B., IEEE
IEEE.2020
- **Sensory Particles with Optical Telemetry**
Ganesan, K., Flores, T. A., Le, B. Q., Muratore, D. G., Patel, N., Mitra, S., Murmann, B., Palanker, D., IEEE
IEEE.2020
- **Separating the Effects of Batch Normalization on CNN Training Speed and Stability Using Classical Adaptive Filter Theory**
Chai, E., Pilanci, M., Murmann, B., Matthews, M. B.
IEEE.2020: 1214-1221
- **A 32 Gb/s PAM-4 Optical Transceiver with Active Back Termination in 40 nm CMOS Technology**
Ho, W., Hsieh, Y., Murmann, B., Chen, W., IEEE
IEEE.2020
- **Implications of Finite Clock Transition Time for LPTV Circuit Analysis**
Weinreich, S., Muratore, D., Chae, Y., McKay, T., Murmann, B., IEEE
IEEE.2020
- **Wearable System Design Using Intrinsically Stretchable Temperature Sensor**
Zhu, C., Schell, E., Kim, M., Bao, Z., Murmann, B., IEEE
IEEE.2020
- **A 10-Gbps Continuous-Time Linear Equalizer for mm-Wave Dielectric Waveguide Communication** *IEEE SOLID-STATE CIRCUITS LETTERS*
Mattia, O. E., Sawaby, M., Zheng, K., Arbabian, A., Murmann, B.
2020; 3: 266-269
- **Analog IC Design Using Precomputed Lookup Tables: Challenges and Solutions** *IEEE ACCESS*
Youssef, A. A., Murmann, B., Omran, H.
2020; 8: 134640–52
- **A Compact 14 GS/s 8-bit Switched-Capacitor DAC in 16 nm FinFET CMOS**
Caragiulo, P., Mattia, O., Arbabian, A., Murmann, B., IEEE
IEEE.2020
- **Ink Development and Printing of Conducting Polymers for Intrinsically Stretchable Interconnects and Circuits** *ADVANCED ELECTRONIC MATERIALS*
Kraft, U., Molina-Lopez, F., Son, D., Bao, Z., Murmann, B.

2020; 6 (1)

- **A Data-Compressive Wired-OR Readout for Massively Parallel Neural Recording**
Muratore, D., Tandon, P., Wootters, M., Chichilnisky, E. J., Mitra, S., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 1128–40
- **A Data-Compressive 1.5/2.75-bit Log-Gradient QVGA Image Sensor With Multi-Scale Readout for Always-On Object Detection** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Young, C., Omid-Zohoor, A., Lajevardi, P., Murmann, B.
2019; 54 (11): 2932–46
- **Intrinsically Stretchable Temperature Sensor Based on Organic Thin-Film Transistors** *IEEE ELECTRON DEVICE LETTERS*
Zhu, C., Wu, H., Nyikayaramba, G., Bao, Z., Murmann, B.
2019; 40 (10): 1630–33
- **A Spectrum-Sensing DPD Feedback Receiver With 30x Reduction in ADC Acquisition Bandwidth and Sample Rate**
Hammler, N., Cathelin, A., Cathelin, P., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 3340–51
- **Custom Sub-Systems and Circuits for Deep Learning: Guest Editorial Overview** *IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS*
Chen, C., Murmann, B., Seo, J., Yoo, H.
2019; 9 (2): 247–52
- **Multi-scale ordering in highly stretchable polymer semiconducting films** *NATURE MATERIALS*
Xu, J., Wu, H., Zhu, C., Ehrlich, A., Shaw, L., Nikolka, M., Wang, S., Molina-Lopez, F., Gu, X., Luo, S., Zhou, D., Kim, Y., Wang, et al
2019; 18 (6): 594+
- **Multi-scale ordering in highly stretchable polymer semiconducting films.** *Nature materials*
Xu, J., Wu, H., Zhu, C., Ehrlich, A., Shaw, L., Nikolka, M., Wang, S., Molina-Lopez, F., Gu, X., Luo, S., Zhou, D., Kim, Y., Wang, et al
2019
- **Global Asymptotic Stability and Stabilization of Long Short-Term Memory Neural Networks with Constant Weights and Biases** *JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS*
Deka, S. A., Stipanovic, D. M., Murmann, B., Tomlin, C. J.
2019; 181 (1): 231–43
- **Low-Voltage, High-Frequency Organic Transistors and Unipolar and Complementary Ring Oscillators on Paper** *ADVANCED ELECTRONIC MATERIALS*
Kraft, U., Zaki, T., Letzkus, F., Burghartz, J. N., Weber, E., Murmann, B., Klauk, H.
2019; 5 (2)
- **An Always-On 3.8 μ J/86% CIFAR-10 Mixed-Signal Binary CNN Processor With All Memory on Chip in 28-nm CMOS**
Bankman, D., Yang, L., Moons, B., Verhelst, M., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2019: 158–72
- **An Energy Harvester Using Image Sensor Pixels With Cold Start and Over 96% MPPT Efficiency**
Shah, N., Lajevardi, P., Wojciechowski, K., Lang, C., Murmann, B., IEEE
IEEE.2019: 207+
- **Long-Short Term Memory Neural Network Stability and Stabilization using Linear Matrix Inequalities**
Deka, S. A., Stipanovic, D. M., Murmann, B., Tomlin, C. J., IEEE
IEEE.2019
- **A Data-Compressive Wired-OR Readout for Massively Parallel Neural Recording**
Muratore, D. G., Tandon, P., Wootters, M., Chichilnisky, E. J., Mitra, S., Murmann, B., IEEE
IEEE.2019
- **Toward Always-On Mobile Object Detection: Energy Versus Performance Tradeoffs for Embedded HOG Feature Extraction** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY*
Omid-Zohoor, A., Young, C., Ta, D., Murmann, B.
2018; 28 (5): 1102–15

- **Skin electronics from scalable fabrication of an intrinsically stretchable transistor array** *NATURE*
Wang, S., Xu, J., Wang, W., Wang, G., Rastak, R., Molina-Lopez, F., Chung, J., Niu, S., Feig, V. R., Lopez, J., Lei, T., Kwon, S., Kim, et al
2018; 555 (7694): 83-+
- **BinarEye: An Always-On Energy-Accuracy-Scalable Binary CNN Processor With All Memory On Chip In 28nm CMOS**
Moons, B., Bankman, D., Yang, L., Murmann, B., Verhelst, M., IEEE
IEEE.2018
- **A 7b 2 GS/s Time-Interleaved SAR ADC with Time Skew Calibration Based on Current Integrating Sampler**
Jiang, W., Zhu, Y., Chan, C., Murmann, B., U, S., Martins, R., IEEE
IEEE.2018: 235-38
- **Clock Synchronous Reset and Skew Calibration of 65GS/s ADCs in A Multi-Lane Coherent Receiver**
Athreya, S., Hedayati, H., Kazemkhani, S., Chen, Y., Vats, S., Scott, M. D., Zeydel, B., Keller, P., Wang, J., Avula, B., Murmann, B., Iroaga, E., IEEE
IEEE.2018: 250-53
- **TRIG: Hardware Accelerator for Inference-Based Applications and Experimental Demonstration Using Carbon Nanotube FETs**
Hills, G., Bankman, D., Moons, B., Yang, L., Hillard, J., Kahng, A., Park, R., Verhelst, M., Murmann, B., Shulaker, M. M., Wong, H., Mitra, S., IEEE
IEEE.2018
- **An Always-On 3.8 mu J/86% CIFAR-10 Mixed-Signal Binary CNN Processor with All Memory on Chip in 28nm CMOS**
Bankman, D., Yang, L., Moons, B., Verhelst, M., Murmann, B., IEEE
IEEE.2018: 222-+
- **A New Figure of Merit Equation for Analog-to-Digital Converters in CMOS Image Sensors**
Kwon, M., Murmann, B., IEEE
IEEE.2018
- **Some Local Stability Properties of an Autonomous Long Short-Term Memory Neural Network Model**
Stipanovic, D. M., Murmann, B., Causo, M., Lekic, A., Royo, V., Tomlin, C. J., Beigne, E., Thuries, S., Zarudniev, M., Lesecq, S., IEEE
IEEE.2018
- **Bit Error Tolerance of a CIFAR-10 Binarized Convolutional Neural Network Processor**
Yang, L., Bankman, D., Moons, B., Verhelst, M., Murmann, B., IEEE
IEEE.2018
- **A 56 Gb/s 6 mW 300 um(2) inverter-based CTLE for short-reach PAM2 applications in 16 nm CMOS**
Zheng, K., Frans, Y., Chang, K., Murmann, B., IEEE
IEEE.2018
- **An Always-On 3.8 mu J/86% CIFAR-10 Mixed-Signal Binary CNN Processor with All Memory on Chip in 28nm CMOS**
Bankman, D., Yang, L., Moons, B., Verhelst, M., Murmann, B., IEEE
IEEE.2018
- **A Pixel Pitch-Matched Ultrasound Receiver for 3-D Photoacoustic Imaging With Integrated Delta-Sigma Beamformer in 28-nm UTBB FD-SOI.** *IEEE journal of solid-state circuits*
Chen, M. C., Perez, A. P., Kothapalli, S. R., Cathelin, P., Cathelin, A., Gambhir, S. S., Murmann, B.
2017; 52 (11): 2843-2856
- **A Mixer Front End for a Four-Channel Modulated Wideband Converter With 62-dB Blocker Rejection** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Adams, D., Eldar, Y. C., Murmann, B.
2017; 52 (5): 1286-1294
- **A highly stretchable, transparent, and conductive polymer.** *Science advances*
Wang, Y., Zhu, C., Pfattner, R., Yan, H., Jin, L., Chen, S., Molina-Lopez, F., Lissel, F., Liu, J., Rabiah, N. I., Chen, Z., Chung, J. W., Linder, et al
2017; 3 (3)
- **A 14-Bit 30-MS/s 38-mW SAR ADC Using Noise Filter Gear Shifting** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II-EXPRESS BRIEFS*
Kramer, M., Janssen, E., Doris, K., Murmann, B.
2017; 64 (2): 116-120

- **Highly stretchable polymer semiconductor films through the nanoconfinement effect** *SCIENCE*
Xu, J., Wang, S., Wang, G. N., Zhu, C., Luo, S., Jin, L., Gu, X., Chen, S., Feig, V. R., To, J. W., Rondeau-Gagne, S., Park, J., Schroeder, et al
2017; 355 (6320): 59-?
- **LOGNET: ENERGY-EFFICIENT NEURAL NETWORKS USING LOGARITHMIC COMPUTATION**
Lee, E. H., Miyashita, D., Chai, E., Murmann, B., Wong, S., IEEE
IEEE.2017: 5900–5904
- **Investigating Limiting Factors in Stretchable All-Carbon Transistors for Reliable Stretchable Electronics.** *ACS nano*
Chortos, A. n., Zhu, C. n., Oh, J. Y., Yan, X. n., Pochorovski, I. n., To, J. W., Liu, N. n., Kraft, U. n., Murmann, B. n., Bao, Z. n.
2017; 11 (8): 7925–37
- **Active control of probability amplitudes in a mesoscale system via feedback-induced suppression of dissipation and noise** *JOURNAL OF APPLIED PHYSICS*
Gupta, C., Perez, A. P., Fischer, S. R., Weinreich, S. B., Murmann, B., Howe, R. T.
2016; 120 (22)
- **The Successive Approximation Register ADC: A Versatile Building Block for Ultra-Low-Power to Ultra-High-Speed Applications** *IEEE COMMUNICATIONS MAGAZINE*
Murmann, B.
2016; 54 (4): 78-83
- **A 14 b 35 MS/s SAR ADC Achieving 75 dB SNDR and 99 dB SFDR With Loop-Embedded Input Buffer in 40 nm CMOS** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Kramer, M. J., Janssen, E., Doris, K., Murmann, B.
2015; 50 (12): 2891-2900
- **Passive charge redistribution digital-to-analogue multiplier** *ELECTRONICS LETTERS*
Bankman, D., Murmann, B.
2015; 51 (5): 387-388
- **A Closed-Loop Reconfigurable Switched-Capacitor DC-DC Converter for Sub-mW Energy Harvesting Applications** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Vaisband, I., Saadat, M., Murmann, B.
2015; 62 (2): 385-394
- **Mismatch Characterization of Small Metal Fringe Capacitors** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Tripathi, V., Murmann, B.
2014; 61 (8): 2236-2242
- **A Four-Channel, +/- 36 V, 780 kHz Piezo Driver Chip for Structural Health Monitoring** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Guo, Y., Aquino, C., Zhang, D., Murmann, B.
2014; 49 (7): 1506-1513
- **Static Integral Nonlinearity Modeling and Calibration of Measured and Synthetic Pipeline Analog-to-Digital Converters** *IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT*
Medawar, S., Murmann, B., Handel, P., Bjorsell, N., Jansson, M.
2014; 63 (3): 502-511
- **Design and Optimization of Continuous-Time Filters Using Geometric Programming** *IEEE International Symposium on Circuits and Systems (ISCAS)*
Seth, S., Murmann, B.
IEEE.2014: 2089–2092
- **A 160 MS/s, 11.1 mW, Single-Channel Pipelined SAR ADC with 68.3 dB SNDR** *36th Annual IEEE Custom Integrated Circuits Conference (CICC) - The Showcase for Integrated Circuit Design in the Heart of Silicon Valley*
Tripathi, V., Murmann, B.
IEEE.2014
- **Low-Rate Identification of Memory Polynomials** *IEEE International Symposium on Circuits and Systems (ISCAS)*
Hammler, N., Eldar, Y. C., Murmann, B.

IEEE.2014: 1034–1037

- **Dynamic Calibration of Undersampled Pipelined ADCs by Frequency Domain Filtering** *IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT*
Medawar, S., Handel, P., Murmann, B., Bjorsell, N., Jansson, M.
2013; 62 (7): 1882-1891
- **Settling Time and Noise Optimization of a Three-Stage Operational Transconductance Amplifier** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*
Seth, S., Murmann, B.
2013; 60 (5): 1168-1174
- **A 256 pixel magnetoresistive biosensor microarray in 0.18 μ m CMOS.** *IEEE journal of solid-state circuits*
Hall, D. A., Gaster, R. S., Makinwa, K., Wang, S. X., Murmann, B.
2013; 48 (5): 1290-1301
- **A 256 Pixel Magnetoresistive Biosensor Microarray in 0.18 μ m CMOS** *IEEE Radio Frequency Integrated Circuits (RFIC) Symposium in Conjunction with the IEEE MTT-S International Microwave Symposium (IMS) / Microwave Week*
Hall, D. A., Gaster, R. S., Makinwa, K. A., Wang, S. X., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2013: 1290–1301
- **A Delta Sigma Interface for MEMS Accelerometers Using Electrostatic Spring Constant Modulation for Cancellation of Bondwire Capacitance Drift** *IEEE International Solid-State Circuits Conference (ISSCC)*
Lajevardi, P., Petkov, V. P., Murmann, B.
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2013: 265–75
- **Mismatch Characterization of Small Metal Fringe Capacitors** *35th Annual IEEE Custom Integrated Circuits Conference (CICC) - The Showcase for Circuit Design in the Heart of Silicon Valley*
Tripathi, V., Murmann, B.
IEEE.2013
- **Energy Limits in A/D Converters** *IEEE Faible Tension Faible Consommation Conference (FTFC)*
Murmann, B.
IEEE.2013
- **A/D Converter Circuit and Architecture Design for High-Speed Data Communication** *35th Annual IEEE Custom Integrated Circuits Conference (CICC) - The Showcase for Circuit Design in the Heart of Silicon Valley*
Murmann, B.
IEEE.2013
- **Integrated Piezo-Element Drive Electronics for Structural Health Monitoring** *8th International Workshop on Structural Health Monitoring*
Guo, Y., Murmann, B.
DESTECH PUBLICATIONS, INC.2013: 1724–1731
- **A Four-Channel, +/- 36 V Piezo Driver Chip for a Densely Integrated SHM System** *9th International Workshop on Structural Health Monitoring (IWSHM)*
Guo, Y., Aquino, C., Zhang, D., Murmann, B.
DESTECH PUBLICATIONS, INC.2013: 1551–1558
- **High-Performance Pipelined ADCs for Wireless Infrastructure Systems** *Advances in Analog and RF IC Design for Wireless Communication Systems*
Elliott, M., Murmann, B.
edited by Manganaro, G., Leenaerts, D.M., W.
Elsevier.2013
- **An 8-bit 450-MS/s Single-Bit/Cycle SAR ADC in 65-nm CMOS**
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- **A Four-Channel, \pm 36 V, 780 kHz Piezo Driver Chip for Structural Health Monitoring**
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- **Static Integral Nonlinearity Modeling and Calibration of Measured and Synthetic Pipeline Analog-Digital Converters** *to appear, IEEE Trans. Instrum. Meas.*
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2013
- **Dynamic Calibration of Undersampled Pipelined ADCs by Frequency Domain Filtering** *IEEE Trans. Instrum. Meas.*
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Lajevardi, P., Petkov, V., P., Murmann, B.
2013; 48 (1): 265-275
- **A 256 Pixel Magnetoresistive Biosensor Microarray in 0.18 μm CMOS** *IEEE J. Solid-State Circuits*
Hall, D., A., Gaster, R., S., Makinwa, K.A., A., Wang, S., X., Murmann, B.
2013; 48 (5): 1290-1301
- **On the use of redundancy in successive approximation A/D converters**
Murmann, B.
2013
- **Mismatch Characterization of Small Metal Fringe Capacitors**
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- **Integrated Piezo-Element Drive Electronics for Structural Health Monitoring**
Guo, Y., Aquino, C., Zhang, D., Murmann, B.
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- **Energy limits in A/D converters**
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2013
- **A/D Converter Circuit and Architecture Design for High-Speed Data Communication**
Murmann, B.
2013
- **A 12-Bit, 200-MS/s, 11.5-mW Pipeline ADC Using a Pulsed Bucket Brigade Front-End**
Dolev, N., Kramer, M., Murmann, B.
2013
- **A 0.11mm², 5.7-to-6.7GHz, Parametrically Pumped Quadrature LC-VCO with Digital Outputs**
Bhardwaj, K., Seth, S., Murmann, B., Lee, T., H.
2013
- **Analysis and Design of Elementary MOS Amplifier Stages**
Murmann, B.
NTS Press.2013
- **Digitally Assisted Data Converter Design**
Murmann, B.
2013
- **A 12-b, 30-MS/s, 2.95-mW Pipelined ADC Using Single-Stage Class-AB Amplifiers and Deterministic Background Calibration** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*
Kim, J. K., Murmann, B.
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- **Engineering the metal gate electrode for controlling the threshold voltage of organic transistors** *APPLIED PHYSICS LETTERS*

- Chung, Y., Johnson, O., Deal, M., Nishi, Y., Murmann, B., Bao, Z.
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