# Full CV of Prof. Ayman Adel Fayed

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## RESEARCH INTERESTS

- Power Management Integrated Circuit, System, and Chip Design including:
  - On-chip power supplies for dynamic energy distribution in analog/RF, digital, and mixed-signal VLSI systems.
  - Fully-integrated, high-frequency power converters for System-on-Chip (SoC) and multi-core processors.
  - Low-noise, wide-band power supplies and power supply modulators for RF applications.
  - Single and multi-cell linear/switching battery charges and battery gauging/monitoring circuits.
  - Multi-input multi-output energy-harvesting power and battery-charging platforms for portable and remotely-deployed devices and biomedical electronics.
  - Integrated power converters/modulation in GaN and SiC.
  - Hardware-secured switched-mode power supplies
  - Circuit and System design of embedded power management solutions, including switching-mode power converters, linear and low drop-out regulators, switching and linear battery chargers, and reference systems.
- Analog and Mixed-Signal Integrated Circuit, System, and Chip Design including:
  - Low-voltage, low-power design in nanometer CMOS technologies.
  - High-speed wire-line SERDES transceivers design for digital communication systems: Adaptive equalizers, Adaptive signal drivers/receivers, Adaptive filters, and clock and data recovery circuits.
  - Data converters design for wireless and multimedia applications.

## EDUCATION

**Ph.D.** in Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, USA. **Dec. 2004**
Dissertation Title "***Adaptive Techniques for Analog and Mixed Signal Integrated Circuits.***"
Adviser: Prof. Mohammed Ismail

**M.Sc.** in Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, USA. **Aug. 2000**
Dissertation Title "***High Speed CMOS Design Techniques for Personal Computer Bus Transceivers.***"
Adviser: Professor Mohammed Ismail

**B.Sc.** in Electronics and Electrical Communications Engineering, Cairo University, Egypt. **Jul. 1998**
Graduation Project "***Sigma-Delta ADC design using unity gain buffers.***"
Adviser: Professor Ahmed Soliman

## PROFESSIONAL EXPERIENCE

### *The Ohio State University, Columbus, Ohio, USA* — 09/2015 – Present

**Professor (08/2020); Associate Professor (09/2015)**
Dept. of Electrical and Computer Engineering
**Founder and Director,** Power Management Research Lab (PMRL)

### *Iowa State University, Ames, Iowa, USA* — 01/2009 – 12/2022

**Affiliate Professor (09/2015-12/2022); Associate Professor (08/2014-08/2015);**
**Northrop Grumman Assistant Professor (01/2009-07/2014)**
Dept. of Electrical and Computer Engineering
**Founder and Director,** Power Management Research Lab (PMRL)

### *Member, Group of Tech. Staff, Texas Instruments Inc., Dallas, Texas* — 09/2005 – 12/2008

**Analog & MS IC Designer,** Nanometer Design Branch, Wireless Terminals Business Unit.

- *System design lead* for the Clear Spectrum Initiative at TI. Responsibility is the development of design/verification methodology for power management modules in mixed-signal SOCs with multi noise-sensitive RF cores. This encompassed circuit design, power distribution networks, package and board parasitics modeling, communication across supply domains, and isolation requirements. The goal is to intercept possibilities of noise coupling between analog/digital/RF modules early in the design process and eliminate post-silicon performance surprises.

- *Design team lead:* System/circuit design of embedded power management solutions for integrated wireless/RF applications in 65nm/45nm digital CMOS technologies. Responsibilities include power system architecture, supply domain definition/specifications, noise budgeting, RF-friendly dc-dc converter design, ripple suppression and cancellation techniques, and low-leakage linear and switching regulators for RF/mixed-signal modules.
- *Design team lead:* The design of various classes of delta-sigma ADCs including switched-C, continuous-time, and single-amplifier based architectures for wireless RF CODEC applications in 45nm/65nm digital CMOS processes including ***industry's first delta-sigma ADC for GSM/WCDMA in 45nm technology***. Responsibilities include: Circuit techniques for low-noise low-power amplifiers, reference buffers, sampling & hold networks, quantizers, clocking schemes, and voltage/current reference generation.

***Texas Instruments Inc., Dallas, Texas*** **01/2000 – 09/2000 and 01/2002 – 09/2005**

**Analog & mixed-signal IC Designer,** Connectivity Solutions Dept.

- *Design team lead:* System and circuit design of the power management module of a single-chip media player in 90nm digital CMOS process with support for multiple battery chemistries and power/charge through USB. Responsibilities include: Architecture development and definition, load sharing and distribution strategy, and circuit techniques for configurable buck/boost DC-DC converters, Li-Ion battery chargers, and linear regulators.
- *Designer:* System and circuit design of front-end receive/transmit paths of several high-speed wire-line SERDES transceivers in multiple digital CMOS technology nodes. Responsibilities include: The receive and transmit paths of Universal Serial Bus USB 2.0 (480Mbps) transceiver in 0.18um/0.13um/90nm process, the receive path of High Definition Multi-Media Interface HDMI (1.65Gbps) transceiver in 0.13um, the receive path of IEEE 1394b transceiver (125Mbps) in 0.18um. The designs encompassed a wide variety of circuit techniques for analog adaptive equalizers, high-speed low-jitter receivers/comparators, voltage/current signal drivers, high-speed signal detectors/rectifiers, automatically-tuned on-chip transmission line termination resistors, low-voltage voltage-controlled transconductors, GM-C filters, and voltage/current references.

## TECHNICAL CONSULTING EXPERIENCE

***Susman Godfrey LLP, USA*** **05/2023 – 10/2024**

**Expert Consultant,** switching DC/DC power converters.

***Jones Day, USA*** **06/2023 – Present**

**Expert Consultant,** power management in portable battery jump starters.

***Herbert Smith Freehills LLP, UK*** **05/2023 – 01/2024**

**Expert Consultant,** high frequency switching power converters.

***Morgan, Lewis & Bockius LLP, USA*** **11/2022 – 02/2023**

**Expert Consultant,** power management in multi-core CPUs.

***Russ August & Kabat, Los Angeles, USA*** **11/2021 – 06/2022**

**Expert Consultant,** power management in multi-core CPUs.

***Morrison and Foerster, LLP, USA*** **11/2020 – 10/2021**

**Expert Consultant,** high-speed wire-line SERDES transceivers.

***Bragalone Conroy, PC, USA*** **08/2019 – 11/2019**

**Expert Consultant,** high-speed wire-line SERDES transceivers.

***Maxlinear Inc., Carlsbad, California, USA*** **01/2018 – 08/2019**

**Member of the Technical Advisory Board**

***Irell and Manella LLP, USA*** **01/2019 – 03/2019**

**Expert Consultant,** analog, mixed-signal, and power management ICs.

***Spencer-Scott LLC, USA*** **02/2015 – 03/2015**

**Expert Consultant,** mixed-signal and memory circuits in power management ICs.

***Pillsbury Winthrop Shaw Pittman LLP, USA*** **11/2013 – 04/2014**

**Expert Consultant,** power management ICs and battery charger ICs.

***Microcontroller Business Unit, Texas Instruments, Dallas, Texas, USA*** **06/2012 – 08/2012**

**Technical Consultant,** light-load switching power converters for low-power microcontrollers.

***ST-Ericson Inc. Nijmegen, Netherlands, Wireless SoC Dept.*** **06/2010 – 07/2010**

**Technical Consultant,** power management unit performance and area optimization in 45nm.

## HONORS & RECOGNITIONS

- Best Associate Editor (2022), IEEE Transactions on Circuits and Systems I, **April. 2023**.
- 2022 IEEE Circuits & Systems Society Outstanding Technical Committee Award, Analog Signal Processing Technical Committee (Serving as Secretary and Chair Elect of the Committee's Board), **Aug. 2022**.
- 2021 IEEE Tran. on Power Electronics Second Place Prize Best Paper Award (co-author M. Singh). **Oct. 2022.**
- Best Associate Editor (2020-2021), IEEE Transactions on Circuits and Systems I, **Sept. 2021**.
- Best poster presentation award (Student: Hua Zhang, Co-Author), IEEE ISPSD, Nagoya, Japan, **Jun. 2021**.
- 1st Place in the 2020 John D. and Alice Nelson Kraus Memorial Graduate Student Poster Competition at OSU (Student: Manmeet Singh). **August 2020**.
- 1st Place in the 2018 Kraus Memorial Graduate Student Poster Competition at OSU (Student: Muhammad Ahmed). **April 2018**.
- IEEE Solid-State Circuits Society Student Travel Grant (STGA) (Student: Muhammad Ahmed). **Jan. 2018**.
- Darlington Best Transactions Paper Award, IEEE Circuits & System Society (co-author Chengwu Tao). **April 2015**.
- Best student paper award (Student: Wei Fu, Co-author), IEEE MWSCAS, College Station, Texas. **Aug. 2014**.
- Selected as best seminar speaker at Berkeley Wireless Research Center (BWRC) in the academic year **2013-2014**, Dept. of Electrical Engineering & Computer Sciences, University of California Berkeley.
- Northrop Grumman Chair Assistant Professor at Iowa State University. **2013 – 2014**.
- NSF CAREER Award. **2013**.
- Senior Member, IEEE. **2010 – Present**.
- Elected Member, Group of Technical Staff, Texas Instruments Inc. **12/2006 – 12/2008**.
- Research on battery life enhancement featured in an interview on WMT radio, Cedar Rapids, Iowa. **2011**.
- Research on power management for portable electronics featured on ISU news services. **2011**.
- Research on improving battery performance efficiency featured on IowaStateDaily.com. **2011**.

## TEACHING & CURRICULUM DEVELOPMENT EXPERIENCE

### *Full-Semester Courses, Dept. of Electrical & Computer Engineering, The Ohio State University*

- Developed & taught ECE 4021: Analog Integrated Circuits I, Fall 2018, 2019, 2020, 2021.
- Developed & taught ECE 5021: Analog Integrated Circuits II, Sp. 2016, Fall 2016, 2017, 2018, Sp. 2020, 2021.
- Developed & taught ECE 5227: Fundamental of Power Management Integrated Circuits for VLSI Systems, Sp. 2017, 2018, 2019, 2021.
- Developed and taught ECE 5023: Fundamentals of Integrated Data Converters, Sp. 2020.
- Taught ECE 3020: Introduction to Electronics, Fall 2016.
- Taught ECE 7021: Analog IC Design, Fall 2015.

### *Full-Semester Courses, Dept. of Electrical & Computer Engineering, Iowa State University*

- Developed and taught EE/CprE 505: CMOS & BICMOS Data Converters, Sp. 2009, 2010, 2011, 2013, 2015.
- Developed and taught EE504: Power Management for VLSI systems, Fall 2009, 2011, 2013.
- EE/CprE 330: Integrated Electronics, Sp. 2012, Fall 2012, Sp. 2014.

### *Short Courses, Developed & taught the following short courses for industry*

- Power Management for VLSI Systems (5-day/3-day short course)
  - Texas Instruments Inc., Dallas, Texas. Taught in Jul. 2012, Sept. 2014, Jan. 2015, Apr. 2015, July 2015, Oct. 2015, May 2016, Aug. 2016, May 2017, Aug. 2017, Feb. 2018, May 2018, Aug. 2018, Nov. 2019.
  - Qualcomm Inc., San Diego, CA. Taught in May 2011, Nov. 2011, Feb. 2012, Nov. 2014, Jun. 2015, Nov. 2015, Mar. 2016, Apr. 2016, Jan. 2017, Mar. 2017, Sept. 2018, Sept. 2019.
  - NXP Inc., Phoenix, Arizona. Taught in Mar. 2017.
  - Texas Instruments Inc., Santa Clara, California. Taught in Apr. 2015.
  - Texas Instruments Inc., Tucson, Arizona. Taught in Jan. 2015.
  - Texas Instruments Inc., Shanghai, China. Taught in Jun. 2014.
  - Qualcomm Inc., Singapore. Taught in Dec. 2014.
  - Besser Associates, San Jose, CA, Aug. 2012 and San Diego, CA, Mar. 2011.
- Fundamentals of Data Converters (3-day short course)
  - Airforce Research Lab (AFRL), Dayton, OH. Taught in Jun. 2021.
  - Qualcomm, San Diego, CA. Taught in Aug. 2014, Sept. 2014, Feb. 2016, Dec. 2016, Jan. 2018, Sept. 2019.
  - Besser Associates, San Diego, CA. Taught in Mar. 2014 and San Jose, CA, Aug. 2013.

***Tutorials*****,** Developed & taught the following tutorials:

- High-Frequency Switching Power Converters for Mixed-Signal SoCs, half-day tutorial, *31st IFIP/IEEE Conference on Very Large Scale Integration (VLSI-SoC 2023)*, Sharjah, UAE, Oct. 2023.
- Introduction to Nyquist-Rate Data Converters, half-day tutorial, *Consortium on Electromagnetics and Radio Frequencies* (CERF), ElectroScience Laboratory, The Ohio State University, Aug. 2022, Aug. 2023.
- Switching Noise Mitigation Techniques for DC-DC Power Converters Powering RF and Analog Circuit Loads, half-day tutorial, *Consortium on Electromagnetics and Radio Frequencies* (CERF), ElectroScience Laboratory, The Ohio State University, Aug. 2020, Aug. 2021, Aug. 2023, Aug. 2024.
- Integrated Dynamic Power Supplies for Mixed-Signal SoCs, half-day tutorial, *Cons. on Electromagnetics and Radio Frequencies* (CERF), ElectroScience Lab., The Ohio State University, Aug. 2020, Aug. 2021, Aug. 2022.
- System and Circuit Fundamentals of Linear and Switching Battery Chargers, half-day tutorial, *IEEE International Conference on Microelectronics* (ICM 2019), Cairo, Egypt, Dec. 2019.
- Switching Noise Mitigation in DC-DC Power Converters for RF, Analog, and Mixed-Signal System-on-Chip (SoCs), half-day tutorial, *Consortium on Electromagnetics and Radio Frequencies* (CERF), ElectroScience Laboratory, The Ohio State University, Columbus, OH, Aug. 2019.
- High-Frequency Integrated Switching Power Supplies, half-day tutorial, *IEEE International Midwest Symposium on Circuits and Systems* (MWSCAS 2019), Dallas, Texas, Aug. 2019.
- On-Chip Dynamic Power Supplies for Mixed-Signal SoCs, half-day tutorial, *IEEE International Symposium on Circuits and Systems* (ISCAS 2019), Sapporo, Japan, May 2019.
- Single- and Multi-Cell Battery Charging and Management Systems for IoT and Automotive Applications, half-day tutorial, *IEEE Int. Midwest Symp. on Circuits and Systems* (MWSCAS 2018), Windsor, Canada, Aug. 2018.
- Switching Noise Mitigation for Integrated DC-DC Converters, half-day tutorial, *IEEE Int. Midwest Symp. on Circuits and Systems* (MWSCAS 2017), Boston, Massachusetts, Aug. 2017.
- Battery Charging System and Circuit Fundamentals for Portable and IoT Devices, half-day tutorial, *IEEE International Symposium on Circuits and Systems* (ISCAS 2017), Baltimore, Maryland, May 2017.
- Fundamentals of Battery Chargers, half-day tutorial, *IEEE Int. MWSCAS*, Abu Dhabi, UAE, Oct. 2016.
- Fundamentals of Power Management for VLSI, full-day tutorial, *IEEE Solid State Circuits Society, UAE Chapter, and Khalifa University*, Abu Dhabi, UAE, Nov. 2015.
- Power Management Circuits for Low-Power Applications, half-day tutorial, *IEEE International Conference on Electronics, Circuits, and Systems* (ICECS 2015), Cairo, Egypt, Dec. 2015.
- Overview of Power Management Circuits for Low-Power Applications, half-day tutorial, Dept. of Electrical and Computer Eng., King Abdullah University of Science & Tech. (KAUST), Jeddah, Saudi Arabia, Mar. 2015.
- Switching Noise Reduction Techniques in DC-DC Converters for Powering Noise-Sensitive Analog and RF Loads, half-day tutorial, *IEEE Int. Symp. on Circuits and Syst.* (ISCAS 2014), Melbourne, Australia, Jun. 2014.
- Power Management Circuits for VLSI Systems, half-day tutorial, Department of Electrical and Computer Engineering, University of Pierre & Marie Curie, Paris VI, Paris, France, December 2013.
- Power Management Circuits for Low-Power Applications, half-day tutorial, *IEEE Int. Midwest Symp. on Circuits and Systems* (MWSCAS 2013), Columbus, Ohio, USA, Aug. 2013.
- Integrated Power Management Circuits for mixed-signal Systems-on-Chip, half-day tutorial, *IEEE International Symposium on Circuits and Systems* (ISCAS 2011), Rio de Janeiro, Brazil, May 2011.

***Short Courses while at Texas Instruments Inc.*****,** Developed & taught the following short courses:

- CMOS Amplifiers design, 1-day short course. Sept. 2006, Oct. 2007.
- Statistical simulation and tools for analog circuits, 1-day short course. July 2006.
- Analog circuits floor planning methodology and tools, 1-day short course, Jan. 2007, Oct. 2007.

***Full-quarter Classes, Dept. of Electrical & Computer Engineering, The Ohio State University***

- EE327 Electronic Devices and Circuits Laboratory, Spring and Summer of 2001.
- EE206 Switching Circuits Laboratory, Summer 1999, EE309 Electrical Circuits Laboratory, Spring 1999

***Teaching Assistant, Dept. of Electrical & Computer Engineering, The Ohio State University***

- EE637 Solid State Microelectronics Laboratory, Fall 1998, 1999, 2000, and 2001.
- EE682 B.Sc. group project in Electrical Engineering Design for 4 graduating seniors, winter 1999.
- EE323 Electronic Analysis, Design and Simulation, Winter 2001.

## CURRENT GRADUATE STUDENTS, POSTDOCS, VISITING SCHOLARS

- **Robbie Milner**, Ph.D. student, Electrical & Computer Eng., The Ohio State University. **Aug. 2022 – Present**
  Research Topic: High-Frequency Switching Power Converters
- **Rawan Abu Sharia**, Ph.D. student, Electrical & Computer Eng., The Ohio State University. **Aug. 2022 – Present**
  Research Topic: Power Management Integrated Circuits
- **S. Arunachalam**, M.Sc. student, Electrical & Computer Eng., The Ohio State University. **Aug. 2023 – Present**
  Project Topic: High-performance Opamp Design
- **Isaiah Hamilton**, M.Sc. student, Electrical & Computer Eng., The Ohio State University. **Aug. 2024 – Present**
  Project Topic: Power Management Integrated Circuits

## FORMER GRADUATE STUDENTS, POSTDOCS, VISITING SCHOLARS

- **John Speasmaker**, "Verification of Spur-Free DF-SIMO Buck Converter in 22nm CMOS," *M.Sc.,* The Ohio State University, Jan. 2023-May 2024. **Currently at Skyworks Inc.**
- **Utsav Gupta**, "Analog, Mixed-Signal, and Power Stage Building Blocks for Switching Power Converter Circuits in Silicon Carbide (SiC) Technology," *Ph.D.,* The Ohio State University. Aug. 2020-Jul. 2023. **Currently with Texas Instruments Inc.**
- **Tanner Tengberg**, "Spur-Free Dual-Frequency Single-Inductor Multiple-Output (DF-SIMO) Buck Converter Topologies," *Ph.D.,* The Ohio State University. Jan. 2020-May 2023. **Currently with Texas Instruments Inc.**
- **Hua Zhang**, "Fully Integrated Switching Power Converters in Silicon Carbide Technology," *Ph.D.,* The Ohio State University. Aug. 2017-May 2022. **Currently with Texas Instruments Inc.**
- **Jacob Perch**, visiting Master's student working on the design and testing of integrated hardware-secured power converters, The Ohio State University. Aug. 2021-May 2022. **Currently with Texas Instruments Inc.**
- **Sita Asar**, "Dual-Frequency Dual-Inductor Multiple-Output (DF-DIMO) Buck Converter Topology with Interleaved Output Power Distribution for Dynamic Voltage Scaling Applications," *Ph.D.,* The Ohio State University. Jan. 2017-Dec. 2020. **Currently with KBR Inc.**
- **Manmeet Singh**, "Switching Power Converter Techniques for Server and Mobile Applications," *Ph.D.,* The Ohio State University. Aug. 2016-Aug. 2020. **Currently with Renesas Electronics Inc.**
- **Manmeet Singh**, "High-Frequency, High-Current Switching Power Converters for Mobile and Server Applications," *M.Sc.,* The Ohio State University, Aug. 2016-May 2019. **Currently with Renesas Electronics Inc.**
- **Muhammad Ahmed**, "Highly-efficient Low-Noise Buck Converters for Low-Power Microcontrollers," *Ph.D.,* The Ohio State University. Aug. 2015-Dec. 2018. **Currently with Texas Instruments Inc.**
- **Bora Tar**, Postdoctoral researcher, Topic: Linear and Switching Battery Chargers, Electrical & Computer Eng., The Ohio State University. May 2016-Dec. 2017. **Currently with Dept. of Physics, The Ohio State University.**
- **Muhammad Ahmed**, "Circuit and System Techniques for Low Noise Buck Regulators for Low Power Applications," *M.Sc.,* The Ohio State University, Aug. 2015-May 2017. **Currently with Texas Instruments Inc.**
- **Ahmed Abdelmoaty**, "Circuit and System Techniques for Energy-Harvesting Platforms for Mobile Applications," *Ph.D.,* The Ohio State University, Aug. 2012-Dec. 2016. **Currently with Qualcomm Inc.**
- **Mina Nashed**, "Variable Spurious Noise Mitigation Techniques in Hysteretic Buck Converters," *Ph.D.,* Iowa State University, Jan. 2013-Dec. 2016. **Currently with Qualcomm Inc.**
- **M. Elkhatib**, visiting scholar (Feb.-Aug. 2016), Electrical & Computer Eng., The Ohio State University. Research Topic: High-performance power supplies using fuzzy control.
- **Yongjie Jiang**, "Dual-Frequency Dual-Inductor Multiple-Outputs (DF-DIMO) Buck converter topology with Fully-Integrated Output Filters," *Ph.D.,* Iowa State University, Aug. 2011-May 2016. **Currently with Apple Inc.**
- **Chih-Wei Chen**, "Dual-Frequency Single-Inductor Multiple-Output (DF-SIMO) Power Converter Topology for SoC Applications," *Ph.D.,* Iowa State University, Jan. 2011-May 2015. **Currently with Samsung Inc.**
- **Wei Fu**, "Power Conversion Techniques in Nanometer CMOS Technologies for Low-Power Applications," *Ph.D.,* Iowa State University, Aug. 2011-May 2015. **Currently with Texas Instruments Inc.**
- **Ahmed Abdelmoaty**, "A Sub-Micro Watt Maximum Power Point Tracking Circuit for Photovoltaic Systems," *M.Sc.,* Iowa State University, Aug. 2012-Jul. 2015. **Currently with Qualcomm Inc.**
- **Mina Nashed**, "Hysteretic Buck Converters with Spur-Free Control," *M.Sc.,* Iowa State University, Jan. 2013-Jul. 2015. **Currently with Qualcomm Inc.**
- **Yongjie Jiang**, "1A, 20MHz/100MHz Dual-Inductor 4-Output Buck Converter with Fully-Integrated Bond-Wire-Based Output Filters for Ripple Reduction," *M.Sc.,* Iowa State University, Aug. 2011-May 2015. **Currently at Apple Inc.**
- **Ailing Mei**, "Linear and Switch-Mode Li-Ion Battery Chargers," *M.Sc.,* Iowa State University, Jan. 2013-May 2014. **Currently with Dialog Semiconductor Inc.**

- **Yingying Chen**, "A Dual-Loop Capacitor-less LDO with Fast Transient Response and High PSR," *M.Sc.*, Iowa State University, Aug. 2012-Jul. 2014. **Currently with Broadcom Corporation**.
- **Mohamed El Mahalawy**, "Wide Bandwidth GaN-based Power Modulator for High Efficiency Power Amplifiers," *M.Eng.*, Iowa State University, Jan. 2012-May 2014. **Currently a PhD Student at UCSB.**
- **Shibing Zhao**, "Capacitor-less high PSR linear regulators," *M.Eng.*, Iowa State University, Jan. 2012-May. 2014. **Currently with Skyworks Inc.**
- **Chengwu Tao**, "PWM Control Architecture for Spur-Free Operation in Buck Regulators," *Ph.D.*, Iowa State University, Aug. 2008-Jul. 2011. **Currently with Qualcomm Inc.**
- **Wei Fu**, "Fully-integrated Buck Regulator with On-chip Passives in 65nm Technology for SoC Applications," *M.Sc.*, Iowa State University, Aug. 2009-Jul. 2011. **Currently with Texas Instruments Inc.**

## UNDERGRADUATE STUDENTS (undergraduate research students, senior design teams)

- **Derek Schmidt, and Phillip Barker,** Undergraduate Research Associates, Electrical & Computer Engineering, The Ohio State University. **Au. 2013-Sp. 2024**
- **John Speasmaker**, Undergraduate Student Researcher, Electrical & Computer Engineering, The Ohio State University. Project: PCB design for high-frequency switching power converters. **Autumn 2023**
- **Maxwell Ganzhorn, Jeffrey Blankenship, Robbie Milner, and Jacob Manion,** Undergraduate Research Associates, Electrical & Computer Engineering, The Ohio State University. Project: Design, simulations and layout of analog and mixed-signal circuits in 22nm CMOS. **Spring 2022**
- **Xi Ye**, Undergraduate Student Researcher, Electrical & Computer Engineering, The Ohio State University. Project: Multi-stage CMOS opamp design. **Summer 2018**
- **Tory Smith and Maranda Reed**, Undergraduate Student Researchers, Electrical & Computer Engineering, The Ohio State University. Project: High-gain CMOS amplifiers with high linearity. **Summer 2017**
- **Troy Bowers, Dana Conrad, Jing Li, Kyle Maginot, Alan Stewart, and Xilu Wang**, Senior Design Team, Electrical & Computer Eng., Iowa State University. Project: Class-D Audio Amplifier. **Au. 2014 – Sp. 2015**
- **Kyle Shearer, Mackenzie Tope, S. Weiss, J. Schau, and S. Bell**, Senior Design Team, Electrical & Computer Eng., Iowa State University. Project: Class-D Audio Amplifier with 3-Band Equalizer. **Au. 2013 – Sp. 2014**
- **T. Christensen, J. Danielson, Y. Ji, and J. Xia**, Senior Design Team, Electrical & Computer Eng., Iowa State University. Project: Low Cost 40Mhz RF Power Meter To Measure up to 1kW Pulsed. **Au. 2014 – Sp. 2015**
- **Jiwei Xia**, Undergraduate Research Student, Electrical & Computer Eng., Iowa State University. Research Topic: Linear Regulator Design & Simulations. **Summer 2013**
- **Ailing Mei**, Undergraduate Research Student, Electrical & Computer Eng., Iowa State University. Research Topic: Buck Converter Design & Simulations. **Summer 2012**
- **Greg Bulleit**, Undergraduate Research Student, Electrical & Computer Eng., Iowa State University. Research Topic: Buck Converter Design & Simulations. **Summer 2012**
- **Qiaoya Cui**, Undergraduate Research Student, Electrical & Computer Eng., Iowa State University. Research Topic: Linear Regulator Design. **Summer 2012**
- **E. Adkins, K. Shen, T. Williams, and R. Zhou**, Senior Design Team, Electrical & Computer Eng., Iowa State University. Project: Lithium Ion Battery Charger For Electric Vehicles – phase 2. **Au. 2011 – Sp. 2012**
- **Mengqian Ding, Dixiao Jiang, and Avinav Verma**, Senior Design Team, Electrical & Computer Eng., Iowa State University. Project: Solar-Powered Mobile Power Station (MPS) – phase 2. **Au. 2011 – Sp. 2012**
- **Aaron Mills**, Undergraduate Independent Studies Student, Electrical & Computer Eng., Iowa State University. Project: Lithium Ion battery protection system (BPS) for the ISU solar car. **Au. 2011**
- **Davendra Jayasingam**, Undergraduate Independent Studies Student, Electrical & Computer Eng., Iowa State University. Project: VENTURA. **Au. 2011**
- **Hao Wang**, Undergraduate Independent Studies Student, Electrical & Computer Eng., Iowa State University. Project: Maximum power point tracking photovoltaic system. **Sp. 2011**
- **P. Tamrakar, J. Skadal, H. Wang, M. Schulte, and B. Zimmerm**, Senior Design Team, Electrical & Comp. Eng., Iowa State University. Project: Multi-Cell Lithium-Ion Battery Management System. **Au. 2010 – Sp. 2011**
- **Brad Jensen, Will Klema, and Nate Schares**, Senior Design Team, Electrical & Comp. Eng., Iowa State University. Project: Mobile Power Station. **Sp. 2010 – Au. 2010**
- **Kelly Byron**, Undergraduate Research Student, Electrical & Computer Eng., Iowa State University. Research Topic: Switching Regulators Analysis. **Summer 2010**
- **B. Chee, T. Baxter, P. Leo, P. Schmitz, and L. Kearns**, Senior Design Team, Electrical & Comp. Eng., Iowa State University. Project: Lithium Ion Battery Charging System for Electric Vehicles. **Au. 2009 – Sp. 2010**

## INVITED TALKS

Invited to present on many topics in the area of integrated power management for RF and mixed-signal SoCs, data converters, high-speed transceivers for wire-line applications, and analog and mixed-signal design.

### ***Invited Talks in Workshops, Conferences, Professional Societies, and Research Labs***

- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," Presentation to the *IEEE Solid-State Circuits Society*, Egypt Chapter, Cairo, Egypt, Dec. 2023.
- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," Presentation to the *Scalable Asymmetric Lifecycle Engagement (SCALE) Seminar Series*, Online, Oct. 2023.
- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," Presentation to the *IEEE Circuits and Systems Society, Dallas Chapter*, Dallas, Texas, May 2021.
- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," **Plenary Speaker**, the *19th Int. Conf. on Aerospace Sciences & Aviation Technology (ASAT-19), Cairo, Egypt*, April 2021.
- Ayman Fayed, "*Security Vulnerabilities of Power Management Circuits*," NSF panel on enabling security primitives and features in RF/Analog domain, Division of ECCS, National Science Foundation, Oct. 2019.
- Ayman Fayed, "*Spur-Free Switching Power Converters and Other Emerging Topics in Integrated Power Management for SoCs*," *Air Force Research Lab (AFRL)*, Dayton, Ohio, July 2018.
- Ayman Fayed, "*Power Supply Noise Mitigation techniques for RF PAs*," a presentation to the workshop "Digital and Analog Techniques for Power-Efficiency Enhancement in Wireless Transmitters," *IEEE RFIC Symposium*, Phoenix, Arizona, May 2015.
- Ayman Fayed, "*Advances in Switching Power Conversion: Noise and EMI Reduction, On-Chip Power Grids, and Energy Harvesting*," Presentation to the *IEEE AP-S/MTT-S, Columbus Chapter*, Columbus, OH, Apr. 2015.
- Ayman Fayed, "*Efficient Powering of RF PAs using DC-DC Power Supplies*," **Plenary Speaker** at the *IEEE Compound Semiconductor IC Symposium (CSICS)*, Monterey, California, October 2013.
- Ayman Fayed, "*Spur-Free Switching Power Converters for Analog and RF Loads*,"
  - Presentation to the *IEEE SSCS, UAE Chapter, and Khalifa University*, Abu Dhabi, UAE, Nov. 2015.
  - Presentation to the 2014 *CMOS Emerging Technologies Research Symposium*, Grenoble, France, Jul. 2014.
  - Presentation to the *IEEE Solid State Circuits Society*, Fort Collins Chapter, Fort Collins, Colorado, Mar. 2013.
  - Online Webinar for the *Microwave Journal*, September 2012.
- Ayman Fayed, "*Noise Spectrum Manipulation Techniques in Switching Power Converters for Analog/RF Loads*," Presentation to the *Government Microcircuit Applications & Critical Technology Conference*, Mar. 2011.
- Ayman Fayed, "*Challenges in Integrated Power Management for Analog, RF, and mixed-signal SoCs*," a presentation to the workshop "Power Management for integrated RF Circuits: Challenges and Solutions," *IEEE RFIC Symposium*, Anaheim, California, May 2010.
- A. Fayed, "*System-level methodology for the power management system design in complex SoCs: minimize the impact of interference through the supply*," a presentation to the workshop "Interference and coupling effects in modern SoC and SiP products: issues, problems and solutions", *IEEE RFIC Symp.*, Anaheim, CA, May 2010.
- Ayman Fayed, "*Design Challenges in Integrated Power Management Solutions for Mixed Signal SoCs*," **Plenary Speaker**, *IEEE Dallas Circuits and Systems Conference*, Dallas, Texas, Oct. 2009.
- Ayman Fayed and Oren Eliezer, "*Post-Silicon and Pre-Silicon Techniques for Minimizing Interference in Wireless SoCs*," a presentation to the workshop "RF SoC Interaction with Peripherals and the Demand for Attention to Coupling Effects in Early Design Phases," *IEEE RFIC Symposium*, Atlanta, Georgia, June 2008.
- Ayman Fayed, "*Coupling through Power Management Modules in Large SoCs*," *IEEE RFIC Symposium*, Atlanta, Georgia, June 2008.

### ***Invited Talks in Industry***

- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," presenting to Presented KBR Inc., Beavercreek, Ohio, Mar. 2024.
- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," presenting to the Smart Mobile Devices & Wearables Business, Global Foundries Inc., Nov. 2023.
- Ayman Fayed, "*Spur-Free Switching Power Converters for Noise-Sensitive Analog/RF Loads*," presenting to the Synopsys Academic & Research Alliances Speaker Series, Synopsys Inc., Nov. 2023.
- Ayman Fayed, "*Introduction to Nyquist-Rate Data Converters*," presenting to Raytheon Company, EL Segundo, CA, Nov. 2022.
- Ayman Fayed, "*Switching Power Converters for Noise-Sensitive Analog/RF Loads*," presenting to KBR Inc., Fairborn, Ohio, Feb. 2022.

- Ayman Fayed, "*Switching Noise Mitigation Techniques for DC-DC Power Converters Powering RF and Analog Circuit Loads*," presenting to Raytheon Company, EL Segundo, CA, Nov. 2021.
- Ayman Fayed, "*On-Chip Dynamic Power Supplies for Mixed-Signal SoCs*," presenting to Cirrus Logic Inc., Austin, Texas, July 2021.
- Ayman Fayed, "*Spur-Free Switching Power Converters for Noise-Sensitive Analog/RF Loads*," presenting to Cirrus Logic Inc., Austin, Texas, June 2021.
- Ayman Fayed, "*Switching Noise Mitigation in DC-DC Power Converters for RF, Analog, and Mixed-Signal System-on-Chip (SoCs)*," presenting to Raytheon Company, EL Segundo, CA, Oct. 2019.
- Ayman Fayed, "*Power Management Integrated Circuits Techniques for Mixed-Signal SoCs*," presenting to Google Inc., Mountain View, CA, Sept. 2019.
- Ayman Fayed, "*High-Current Multi-Phase Converters for High-Performance CPUs*," presenting to Maxlinear Inc., San Jose, CA, Jan. 2019.
- Ayman Fayed, "*Spur-Free Switching Power Converters and Other Emerging Topics in Integrated Power Management for SoCs*," presenting to Silicon Labs Inc., Austin, TX, Feb. 2018.
- Ayman Fayed, "*Emerging Topics in Integrated Power Management for VLSI Systems*," presenting to Maxlinear Inc., San Jose, CA, Oct. 2017.
- Ayman Fayed, "*Integrated Power Management for Low-Power Low-Cost Microcontrollers: Challenges & Solutions*," presenting to Texas Instruments Inc., Dallas, TX, Jun. 2017.
- Ayman Fayed, "*Emerging Topics in Integrated Power Management for VLSI Systems*," presenting to NXP Inc., Phoenix, AZ, Apr. 2017.
- Ayman Fayed, "*Integrated Power Management for Automotive Applications*," presenting to Ford Motor Company, Dearborn, MI, Jun. 2016.
- Ayman Fayed, "*Low-Noise Switching Power Converters*," presenting to Fairchild Inc., San Jose, CA, Jun. 2015.
- Ayman Fayed, "*Advances in Switching Power Conversion: Noise and EMI Reduction, On-Chip Power Grids, and Energy Harvesting*," presenting to Rockwell Collins Inc., Cedar Rapids, Iowa, May 2014.
- Ayman Fayed, "*Spur-Free Switching Power Converters for Analog and RF Loads*," presenting to:
  - Texas Instruments Inc., Freising, Germany, July 2014.
  - Maxlinear Inc., Carlsbad, California, March 2014.
  - RF Group, Newport Media Inc., Lake Forest, California, December 2013.
  - Analog & RF Microelectronics Group, Broadcom Inc., Irvine, California, October 2012.
  - Power Group, Analog Devices Inc., October 2012.
  - Power Management Research Group, TSMC Inc., Austin, Texas, Oct. 2012.
  - Advanced Technology Center, Rockwell Collins Inc., Cedar Rapids, Iowa, May 2012.
  - Micrel Inc., October 2011.
  - Low Power RF design group, Baltimore, Texas Instruments Inc., Maryland, June 2011.
- Ayman Fayed, "*Analog Design for Undergraduates: Are Senior Design Projects Enough?*," presenting to the Texas Instruments Engibous Summit, Texas Instruments Inc., Dallas, Texas, July 2013.
- Ayman Fayed, "*Low-power switching buck converter in 65nm with enhanced light-load efficiency*," presenting to the Microcontroller business unit, Texas Instruments Inc., Dallas, Texas, July 2012.
- Ayman Fayed, "*Integrated Power Management in Nanometer CMOS technologies*," presenting to the Microcontroller business unit, Texas Instruments Inc., Dallas, Texas, June 2012.
- Ayman Fayed, "*Integrated Power Regulators Design in Nanometer CMOS for Mixed-signal SoCs*," Distinguished Speaker Series, presenting to National Semi Corp., San Jose, CA, Apr. 2012.
- Ayman Fayed, "*Integrated Power Management for Analog/RF Mixed-Signal SoCs*," presenting to:
  - Distinguished Speaker Series, Virtual Labs Center, National Semi Corp., San Jose, California, April 2011.
  - Government Systems Lab, Rockwell Collins Inc., Cedar Rapids, Iowa, Nov. 2010.
  - Design Eng. Center for GPRS, EDGE and 3G wireless, Skyworks Inc., Cedar Rapids, Iowa, Nov. 2010.
  - Wireless SoCs group, ST-Ericson Inc., Nijmegen, Netherlands, Jul. 2010.
  - Kilby Research Center, Texas Instruments Inc., Dallas, Texas, Jul. 2010.
- Ayman Fayed, "*Challenges in Integrated Power Management for Analog, RF, and mixed-signal SoCs*," presenting to Kaben Wireless Silicon Inc., Ottawa, Ontario, Canada, April 2010.
- Ayman Fayed, "*Power Management for Portable Electronics*," presenting to the High Performance Analog Group, Texas Instruments Inc., Dallas, Texas, Oct. 2009.
- Ayman Fayed, "*Circuit and System Techniques for Adaptive Equalization in High High-Speed Wire Wire-Line Applications*," presenting SWS Inc., Cairo, Egypt, January 2008.

## ***Invited Talks in Academia***

- Ayman Fayed, "Spur-Free Switching Power Converters for Noise-Sensitive Analog/RF Loads," SCALE Seminar Series, Department of Electrical and Computer Engineering, Vanderbilt University, Nashville, Tennessee, Oct. 2024.
- Ayman Fayed, "On-Chip Dynamic Power Supplies for Mixed-Signal SoCs," SCALE Seminar Series, Department of Electrical and Computer Engineering, Vanderbilt University, Nashville, Tennessee, Oct. 2023.
- Ayman Fayed, "Spur-Free Switching Power Converters for Noise-Sensitive Analog/RF Loads," Dept. of Electrical and Computer Eng., Texas A&M University, College Station, Texas, Apr. 2023.
- Ayman Fayed and Steven Bibyk, "Microelectronics in the US Midwest: Opportunities for University Collaboration," Dept. of Electrical and Computer Eng., Wayne State University, Detroit, Michigan, Oct. 2022.
- Ayman Fayed, "On-Chip Dynamic Power Supplies for Mixed-Signal SoCs," Distinguished Seminar Series, Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan, Jan. 2021.
- Ayman Fayed, "Emerging Topics in Integrated Power Management for VLSI Systems," Department of Electrical and Computer Engineering, Wayne State University, Detroit, Michigan, April 2017.
- Ayman Fayed, "Low-Noise, Low-EMI Switching Power Converters," Department of Electrical and Computer Engineering, King Abdullah University of Science & Technology (KAUST), Jeddah, Saudi Arabia, Mar. 2015.
- Ayman Fayed, "*Spur-Free Switching Power Converters for Analog and RF Loads*," presenting to:
  - Berkeley Wireless Research Center (BWRC), Dept. of Electrical Eng. & Comp. Sciences, University of California Berkeley, Apr. 2014. **Selected best seminar speaker at BWRC in the academic year 2013-2014**.
  - Dept. of Electrical and Comp. Eng., University of Pierre & Marie Curie, Paris VI, Paris, France, Dec. 2013.
  - Hispanic Engineering, Science, and Technology week (HESTECH 2013), Department of Electrical and Computer Engineering, University of Texas Pan-American, Edinburg, Texas, October 2013.
  - Dept. of Electrical & Computer Engineering, The Ohio State University, Columbus, Ohio, August 2013.
  - Laboratory for Power Management and Integrated Switch-Mode Power Supplies, Department of Electrical Engineering, University of Toronto, Toronto, Canada, Apr. 2013.
  - Research Colloquium Series, Dept. of Electrical Eng., University of Washington, Seattle, Mar. 2013.
  - Department of Electronics and Electrical Communication, Ain Shams University, Cairo, Egypt, January 2013.
  - Dept. of Electronics and Electrical Communication, Cairo University, Giza, Egypt, January 2013.
  - Dept. of Computer Science and Engineering, American University in Cairo, Cairo, Egypt, January 2013.
  - Department of Electrical, Computer, and Energy Eng., Arizona State University, Tempe, Arizona, Dec. 2012.
  - Department of Electrical & Computer Eng., Texas A&M University, College Station, Texas, Nov. 2012.
  - Dept. of Electrical Eng., Stanford University, Rethinking Analog Design (RAD) Seminar Series, Nov. 2012.
- Ayman Fayed, "Integrated Power Management for Mixed-Signal SoCs: Challenges & Solutions," Department of Electrical Engineering, Mathematics, and Computer Science, Delft University, Netherlands, Nov. 2009.
- Ayman Fayed, "*Circuit and System for Adaptive Equalization in Wire-Line Applications*," presenting to:
  - Electrical and Computer Engineering Department, Texas A&M University, April 2008.
  - Electrical Engineering and Computer Science Dept., Northwestern University, February 2008.
  - Electrical Engineering and Computer Science Dept., UC-Irvine, February 2008.
  - Department of Electrical & Computer Eng., Ain Shams University, Cairo, Egypt, January 2008.
  - Electrical and Computer Engineering Department, University of Waterloo, October 2007.
  - Dept. of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, October 2007.
  - IEEE Solid State Circuits Society, Phoenix Chapter, Arizona State University, October 2007.
  - Department of Electrical & Computer Eng., The ElectroScience Lab., The Ohio State University, March 2007.

# SERVICES

## ***Disciplinary and Professional Societies***

- Chair, Analog Signal Processing Technical Committee, *IEEE CASS*, 2022-present.
- Chair-Elect, Analog Signal Processing Technical Committee, *IEEE CASS*, 2021-2022.
- Track Co-Chair, Power Electronics Integration and Manufacturing, *IEEE APEC*, 2018-present.
- Member of the Editorial Board, Associate Editor, *IEEE Tran. on Circuits & Systems I*, Jan. 2016-June 2023.
- Member of the Steering Committee, *IEEE MWSCAS*, 2013-present.
- Member, Technical Program Committee, Analog Baseband Circuits Sub-Committee, *IEEE RFIC Symposium*, 2011-2021.

- Secretary, Analog Signal Processing Technical Committee, *IEEE CASS*, 2019-2021.
- Member, Analog Signal Processing Technical Committee, *IEEE CASS*, 2012-2019.
- Panelist, NSF panel on enabling security primitives and features in RF/Analog domain, Division of Electrical, Communications & Cyber Systems (ENG/ECCS), National Science Foundation, Oct. 2019.
- Member of the Technical Program Committee, Tutorials & Special Sessions Chair, *IEEE MWSCAS 2019*.
- Member of the Technical Program Committee, Tutorials & Special Sessions Chair, *IEEE MWSCAS*, 2017.
- Member of the Technical Program Committee, Tutorials & Special Sessions Chair, *IEEE MWSCAS 2016*.
- Member of the Editorial Board, Associate Editor, *IEEE Tran. on Circuits & Systems II*, May 2014-Dec. 2015.
- Panelist, 2015 NSF CAREER Panel, Directorate of Engineering, Division of Energy, Power, Control and Networks. Nov. 2014.
- Member of the Technical Program Committee, Chair of Tutorials and Special Sessions, *IEEE MWSCAS 2013*.
- Member of the Technical Program Committee, *IEEE ICM*, 2011.
- Member of the Editorial Board, *Journal of VLSI Design*, Associate Editor, June 2008-December 2009.
- Serving as a member of MentorNet: The E-mentoring network for diversity in Engineering and science from 2007 to 2008. Mentored one female PhD student at CMU during my tenure at Texas Instruments.
- Serving as a reviewer for the following journals: IEEE Journal of Solid State Circuits, IEEE Transactions on Power Electronics, IEEE Transactions on Microwave Theory and Techniques, IEEE Transactions on Circuits and Systems I and II, IEEE Transactions on VLSI Systems, IEEE Transactions on Energy Conversion, IET Electronics Letters, IET Circuits, Devices and Systems, Microelectronics Journal, International Journal of Analog Integrated Circuits and Signal Processing.
- Serving as a reviewer for the following conferences: IEEE RFIC Symposium, IEEE International Symposium on Circuits & Systems, IEEE Biomedical Circuits & Systems Conference, IEEE Dallas Circuits & Systems Workshop, IEEE Midwest Symp. on Circuits and Systems, IEEE Int. Conference on Microelectronics.
- Senior member of IEEE, Member of the IEEE Solid-state Circuits Society, IEEE Power Electronics Society, IEEE Microwave Theory and Techniques Society, and IEEE Circuits and Systems Society.

## ***Workshops, Special Sessions, and Conference Sessions***

- Session Chair, "Regulators & Analog Signal Processing Circuits", *IEEE ISCAS 2023*, Monterey, CA, May 2023.
- Session Co-Chair, "Current References and LDOs", *IEEE ISCAS 2023*, Monterey, CA, May 2023.
- Session Chair, "Data Converters", *IEEE ISCAS 2020*, Seville, Spain, October 2020.
- Session Co-Chair, "Low Power and Power Management Circuits", *IEEE MWSCAS 2019*, Dallas, TX, Aug. 2019.
- Workshop Organizer and Chair, "Analog and RF hardware security: Motivation, Challenges, and Solutions" *IEEE RFIC Symposium*, Boston, Massachusetts, June 2019.
- Session Chair, "Reference Circuits", *IEEE ISCAS 2019*, Sapporo, Japan, May 2019.
- Session Chair, "Time and Reference Circuits Technology", *IEEE ISCAS 2019*, Sapporo, Japan, May 2019.
- Session Co-Chair, "Hardware Implementation of Neural Network and Neuromorhic Computing", *IEEE MWSCAS 2018*, Windsor, Canada, Aug. 2018.
- Session Co-Chair, "Power Converters", *IEEE MWSCAS 2018*, Windsor, Canada, Aug. 2018.
- Workshop Co-Organizer and Co-Chair, "Sub-6GHz 5G Power Amplifiers and advanced efficiency enhancement techniques" *IEEE RFIC Symposium*, Philadelphia, PA, June 2018.
- Session Chair, "Power Management Circuits", *IEEE ISCAS 2018*, Florence, Italy, June 2018.
- Session Co-Chair, "Other Topics in Mixed-Signal Design", *IEEE ISCAS 2018*, Florence, Italy, June 2018.
- Session Chair, "Non-Linear Analog Systems", *IEEE MWSCAS 2017*, Boston, Massachusetts, Aug. 2017.
- Session Chair, "Regulators & References", *IEEE ISCAS 2017*, Baltimore, Maryland, May 2017.
- Session Co-Chair, "RF Circuits III", *IEEE ISCAS 2017*, Baltimore, Maryland, May 2017.
- Session Co-Chair, "Oscillators, Phaselocked Loops", *IEEE ISCAS 2017*, Baltimore, Maryland, May 2017.
- Session Co-Chair, "DC-DC Converters", *IEEE APEC 2017*, Tamps, Florida, March 2017.
- Session Chair, "Invited Papers", *IEEE MWSCAS 2016*, Abu Dhabi, UAE, Oct. 2016.
- Session Chair, "Tutorial Papers", *IEEE MWSCAS 2016*, Abu Dhabi, UAE, Oct. 2016.
- Session Chair, "Regulators", *IEEE ISCAS 2016*, Montreal, Canada, May 2016.
- Workshop Co-Organizer and Co-Chair, "Digital and Analog Techniques for Power-Efficiency Enhancement in Wireless Transmitters" *IEEE RFIC Symposium*, Phoenix, Arizona, May 2015.
- Special Session Co-Organizer and Co-Chair, "Advanced Power Management Circuits", *IEEE MWSCAS 2014*, College Station, Texas, August 2014.
- Session Chair, "Switching & Linear Power Conversion Techniques", *IEEE MWSCAS 2014*, College Station, Texas, Aug. 2014.

- Session Co-Chair, "Power Converters for Energy Harvesting Applications", *IEEE MWSCAS 2014*, College Station, Texas, August 2014.
- Session Co-Chair, "ADC-I", *IEEE ISCAS 2014*, Melbourne, Australia, June 2014.
- Workshop Organizer and Chair, "GaN-based Power Supplies and Power Supply Modulators for Efficient Powering of RF PAs", *IEEE RFIC Symposium*, Tampa Bay, Florida, June 2014.
- Session Chair, "Power Management and Energy Harvesting", *IEEE MWSCAS*, Columbus, Ohio, USA, Aug. 2013.
- Session Co-Chair, "Design and Analysis for Power Systems and Power Electronics", *IEEE MWSCAS*, Columbus, Ohio, USA, August 2013.
- Session Co-Chair, "Baseband circuits and modulators/demodulators", *IEEE RFIC symposium*, Seattle, Washington, USA, June 2013.
- Session Co-Chair, "Baseband circuits and modulators for wideband transceivers", *IEEE RFIC symposium*, Montreal, Canada, June 2012.
- Interactive Forum Co-Chair, *IEEE RFIC symposium*, Montreal, Canada, June 2012.
- Session Chair, "Nyquist-rate Data Converters", *IEEE MWSCAS*, Seoul, South Korea, August 2011.
- Session Co-Chair, "On-Chip Power Management", *GOMACTech 2011*, Orlando, Florida, March 2011.
- Workshop Organizer and Chair, "Power Management for integrated RF Circuits: Challenges and Solutions", *IEEE RFIC Symposium*, Anaheim, California, May 2010.

### ***University & Campus***

- Member of the Curriculum Committee, Dept. of ECE, The Ohio State University, 08/2023-Present.
- Member of the Advisory Committee, Dept. of ECE, The Ohio State University, 08/2022-Present.
- Member of the Technology and Computing Infrastructure (TCI) Faculty Advisory Committee, College of Engineering, The Ohio State University, 11/2021-Present.
- Member of Teaching Subcommittee of the Promotion and Tenure Committee, Dept. of ECE, The Ohio State University, 08/2021-07/2023.
- Member of the Curriculum Committee, Dept. of ECE, The Ohio State University, 09/2015-08/2022.
- Member of the ABET Committee, Dept. of ECE, The Ohio State University, 09/2019-08/2021.
- Member of the Dept. Chair Search Committee, Dept. of ECE, The Ohio State University, 08/2017-07/2018.
- Chair of the Analog/RF Electronic Circuits Area, Dept. of ECE, The Ohio State University, 08/2016-Present.
- Member of the Personnel Committee, Dept. of ECE, The Ohio State University, 08/2016-07/2018.
- Member of the University Fellowship Committee, Dept. of ECE, The Ohio State University, 09/2015-05/2016.
- Chair of the VLSI Group, Dept. of ECpE, Iowa State University, 08/2013-07/2015.
- Member of the Graduate Education Committee, Dept. of ECpE, Iowa State University, 08/2013-07/2015.
- Member of the Curriculum Committee, Dept. of ECpE, Iowa State University, 07/2009-07/2011.
- Member of the Graduate Admission Committee, Dept. of ECpE, Iowa state University, 01/2009-07/2013.
- Frequently presenting to undeclared engineering students about Electrical Engineering.
- Serving as a faculty mentor for many undergraduate students.

## PUBLICATIONS

### Books/Book Chapters:

[1] A. A. Fayed, and M. Ismail, "Adaptive Techniques for Mixed Signal System on Chip*,"* Springer, Boston. Sept. 2006.

[2] M. Ismail, Seok-Bae Park, A. A. Fayed, and R.F. Wassenaar "Operational Transconductance Amplifiers", ch. 25, pp. 25-1-19, The VLSI Handbook, 2nd Ed., CRC Press, 2006.

### Peer-Reviewed Journal papers:

[3] U. Gupta, H. Zhang, T. Liu, S. Isukapati, E. Ashik, A. Morgan, B. Lee, W. Sung, A. Agarwal, and A. Fayed, "A 400V Buck Converter Integrated with Gate- Drivers and Low-Voltage Control in a 25V- 600V Mixed-Mode SiC CMOS Technology," *Int. J. of Analog Integrated Circuits and Signal Processing*, April 2024.

[4] S. B. Isukapatia, H. Zhang, T. Liu, U. Gupta, E. Ashik, A. J. Morgan, S. Y. Jang, B. Lee, W. Sung, A. Fayed, and A. K. Agarwal, "Design and experimental demonstration of high-voltage lateral nMOSFETs and high-temperature CMOS ICs," *Materials Science in Semiconductor Processing*, vol. 169, no. 1, pp. 1-9, Jan. 2024.

[5] U. Gupta, A. Vass-Varnai, V. H. Wong, and A. Fayed, "Analysis and Modeling of a SiC Based Buck Converter and Its Effects in an Electric Vehicle Application," *Journal of Electronic Packaging*, vol. 145, no. 4, pp. 041106-1-041106-10, Dec. 2023.

[6] T. Liu, H. Zhang, S. B. Isukapatiy, E. Ashik, A. J. Morgan, B. Lee, W. Sung, A. Fayed, M. H. White, and A. K. Agarwal, "SPICE Modeling and Circuit Demonstration of a SiC Power IC Technology," *IEEE Journal of the Electron Devices Society*, vol. 10, no. 2, pp. 129-138, Feb. 2022.

[7] M. Singh and A. Fayed, "A 1-A 6-MHz Digitally-Assisted Buck-Boost Converter with Seamless Mode Transitions and Fast Dynamic Performance for Mobile Devices," *IEEE Tran. on Power Electronics*, vol. 36, no. 4, pp. 4338-4351, Apr. 2021. **Received 2021 IEEE Tran. on Power Electronics 2nd Place Prize Paper Award.**

[8] M.S. Ahmed and A. Fayed, "A Current-Mode Delay-based Hysteretic Buck Regulator with Enhanced Efficiency at Ultra-light loads for Low-Power Microcontrollers," *IEEE Tran. on Power Electronics*, vol. 35, no. 1, pp. 471-483, Jan. 2020.

[9] Y. Jiang, S. Asar, M. Ahmed, H. Zhang, and A. Fayed, "Output Control Techniques for Dual-Frequency SIMO Buck Converters," *IEEE Trans. on Circuits & Systems I*, vol. 66, no. 10, pp. 4055-4067, Oct. 2019.

[10] M. Nashed and A. Fayed, "Current-Mode Hysteretic Buck Converter with Spur-Free Control for Variable Switching Noise Mitigation," *IEEE Tran. on Power Electronics*, vol. 33, no. 1, pp. 650-664, Jan. 2018.

[11] Ahmed Abdelmoaty, Mohammad Al. Shyoukh, Y.C. Hsu, and Ayman Fayed, "A MPPT Circuit with 25 μW Power Consumption and 98.7% Tracking Efficiency for PV Systems," *IEEE Transactions on Circuits & Systems I*, vol. 64, no. 2, pp. 272-282, Feb. 2017.

[12] Yongjie Jiang and Ayman Fayed, "A 1A, Dual-Inductor 4-Output Buck Converter with 20-MHz/100-MHz Dual-Frequency Switching and Integrated Output Filters in 65nm CMOS," *IEEE Journal of Solid-State Circuits*, vol. 51, no. 10, pp. 2485-2500, Oct. 2016.

[13] Wei Fu, M. Radhakrishnan, S. T. Tan, R. Byrd and Ayman Fayed, "A DCM-only Buck Regulator with Hysteretic-Assisted Adaptive Minimum On-time Control for Low-Power Microcontrollers," *IEEE Transactions on Power Electronics*, vol. 31, no. 1, pp. 418-429, Jan. 2016.

[14] Chih-Wei Chen and Ayman Fayed, "A Low-Power Dual-Frequency SIMO Buck Converter Topology with Fully-Integrated Outputs and Fast Dynamic Operation in 45-nm CMOS," *IEEE Journal of Solid-State Circuits*, vol. 50, no. 9, pp. 2161-2173, Sept. 2015.

[15] C. Tao and A. Fayed, "PWM Control Architecture with Constant Cycle Frequency Hopping and Phase Chopping for Spur-Free Operation in Buck Regulators," *IEEE Tran. on VLSI*, vol. 21, no. 9, pp. 1596-1607, Sept. 2013.

[16] W. Burkland, C. Tao, and A. Fayed, "Output Switching Noise Spectral Analysis and Modeling in Buck Regulators," *Microelectronics Journal*, vol. 44, no. 5, pp. 373-381, Mar. 2013.

[17] Chengwu Tao and Ayman Fayed, "A Low-Noise PFM-Controlled Buck Converter for Low-Power applications," *IEEE Transactions on Circuits and Systems I*, vol. 59, no. 12, pp. 3071-3080, Dec. 2012. **Received the 2015 IEEE CAS Society Darlington Best Paper Award.**

[18] Chengwu Tao and Ayman Fayed, "A GSM Power Amplifier Directly-Powered from a DC-DC Power Converter," *IEEE Microwave and Wireless Components Letters*, vol. 22, no. 1, pp. 38-40, Jan. 2012.

[19] Chengwu Tao and Ayman Fayed, "A Buck Converter with Reduced Output Spurs using Asynchronous Frequency Hopping," *IEEE Transactions on Circuits and Systems II*, vol. 58, no. 11, pp. 709-713, Nov. 2011.

[20] Yogesh K. Ramadass, Ayman A. Fayed, and Anantha P. Chandrakasan, "A Fully-Integrated Switched-Capacitor Step-Down DC-DC Converter With Digital Capacitance Modulation in 45 nm CMOS," *IEEE Journal of Solid-State Circuits*, vol. 45, no. 12, pp. 2557-2565, Dec. 2010.

[21] Ayman Fayed, Russell Byrd, and Baher Haroun, "An adaptive high-voltage protection and common-mode adjustment circuit for passive-active continuous-time sigma-delta ADCs," *Journal of Analog Integrated Circuits and Signal Processing*, vol. 62, no. 2, pp. 159-166, Feb. 2010.

[22] Ayman Fayed, and M. Ismail, "A Low-Voltage, Low-Power CMOS Analog Adaptive Equalizer for UTP-5 Cables," *IEEE Transactions on Circuits and Systems I*, vol. 55, no. 2, pp. 480-495, March 2008.

[23] Ayman A. Fayed, and M. Ismail "A Digital Calibration Algorithm for implementing accurate On Chip Resistors*," Int. J. of Analog Integrated Circuits and Signal Processing*, vol. 47, no. 3, pp. 259-272, June 2006.

[24] Ayman Fayed, M. Ismail, "A Low-Voltage, Highly-Linear, Voltage-Controlled Transconductor," *IEEE Transactions on Circuits and Systems II*, vol. 52, no. 12, pp. 831-835, Dec. 2005.

[25] Ayman A. Fayed, and M. Ismail "A High Speed, Low Voltage CMOS Offset Comparator*," International Journal of Analog Integrated Circuits and Signal Processing,* vol. 36, no. 3, pp. 267-272, Sept. 2003.

## Peer-Reviewed Conference papers:

[26] T. Tengberg, H. Zhang, and A. Fayed, "Spur-Free Switch-Mode Power Supplies," *2023 IEEE Int. Midwest Symp. on Circuits and Systems (MWSCAS)*, Phoenix, Arizona, Aug. 2023, pp. 1-4.

[27] H. Zhang, T. Liu, U. Gupta, S. B. Isukapatiy, E. Ashik, A. J. Morgan, B. Lee, W. Sung, A. K. Agarwal, and A. Fayed, "A 600V Half-Bridge Power Stage Fully Integrated with 25V Gate-Drivers in SiC CMOS Technology," *2022 IEEE Int. Midwest Symp. on Circuits and Systems (MWSCAS)*, Fukuoka, Japan, Aug. 2022, pp. 1-4.

[28] E. Ashik, S. Isukapati, H. Zhang, T. Liu, U. Gupta, A. Morgan, V. Misra, W. Sung, A. Fayed, A. Agarwal, B. Lee, "Bias Temperature Instability on SiC n- and p-MOSFETs for High Temperature CMOS Applications," *2022 IEEE International Reliability Physics Symposium (IRPS)*, Mar. 2022, pp. 3B.4-1 to 3B.4-8.

[29] S. Isukapati, H. Zhang, T. Liu, E. Ashik, B. Lee, A. Morgan, W. Sung, A. Fayed, A. Agarwal, "Development of Isolated CMOS and HV MOSFET on an $N^-$epi/$P^-$epi/4H-SiC $N^+$ Substrate for Power IC Applications," *2021 IEEE 8th Workshop on Wide Bandgap Power Devices and Applications (WIPDA)*, Nov. 2021, pp. 118-122.

[30] Tanner Tengberg and Ayman Fayed, "A Dual-Frequency Single-Inductor Single-Output DC-DC Converter Topology with Spur-Free Switching for Security Applications," *2021 IEEE Int. Midwest Symposium on Circuits and Systems (MWSCAS)*, East Lansing, Michigan, Aug. 2021, pp. 974-977.

[31] T. Liu, H. Zhang, S. B. Isukapatiy, E. Ashik, A. J. Morgan, B. Lee, W. Sung, M. H. White, A. Fayed, and A. K. Agarwal, "SPICE Modeling and CMOS Circuit Development of a SiC Power IC Technology," *2021 IEEE Int. Midwest Symp. on Circuits and Systems (MWSCAS)*, East Lansing, Michigan, Aug. 2021, pp. 966-969.

[32] S. B. Isukapati, H. Zhang, T Liu, E. Ashik, B. Lee, A. J. Morgan, W. Sung, A. Fayed, A. K. Agarwal, "Monolithic Integration of Lateral HV Power MOSFET with LV CMOS for SiC Power IC Technology," *2021 IEEE 33rd International Symposium on Power Semiconductor Devices and ICs (ISPSD)*, Nagoya, Japan, Jun. 2021, pp. 267-270. **Recipient of best poster presentation award**.

[33] Manmeet Singh and Ayman Fayed, "A 2-A 6-MHz Hysteretic Buck Converter with an 8-Bit Digital Jitter-Insensitive Frequency Correction Loop using Dual-Sided Hysteretic Band Modulation," *2020 IEEE Int. Midwest Symposium on Circuits and Systems (MWSCAS)*, Springfield, MA, Aug. 2020, pp. 754-757.

[34] M.S. Ahmed, W. Fu, R. Byrd, and A. Fayed, "A Spur-free, 150-mA Buck Regulator with 96.3% Peak-Efficiency and 77.2% Minimum Efficiency at 10-µA Load for Microcontrollers with Noise-Sensitive ADCs," *2020 IEEE Applied Power Electronics Conf. (APEC)*, New Orleans, Louisiana, Mar. 2020, pp. 1298-1301.

[35] Manmeet Singh and Ayman Fayed, "Imbalanced High-Current Multi-Phase Buck Converters for High-Performance CPUs," *2019 IEEE International Midwest Symposium on Circuits and Systems (MWSCAS)*, Dallas, Texas, Aug. 2019, pp. 929-932.

[36] M.S. Ahmed and A. Fayed, "An All-Passive Emulated Ripple Control Technique For Constant-On-Time Buck Converters In CCM," *2019 IEEE Int. symposium on circuits and Systems (ISCAS)*, Sapporo, Japan, May 2019, pp. 1-4.

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