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Highlight of Career Major Accomplishments

Research Excellence

- **4** Macau Science and Technology Invention Awards (3rd in 2022, 1st in 2020, 2nd in 2018 and 2nd in 2014), **3** Best Paper Awards (A-SSCC 2015, ASPDAC 2016, BioCAS 2013), **1** ISSCC Predoctoral Achievement Award (as PhD supervisor), and **1** ISSCC Silkroad Award (as PhD co-supervisor).
- Published **175** publications including **102** published journals, **73** conferences, **1** book, **2** book chapter, and **15** U.S./Chinese patents.
- Obtained **14** research grants as principle investigator (**PI**) with a total funding of **~19.8 million MOP (~2.5 million USD)**, as well as **4** research grants as **co-PI**.
 - Secured **12** research grants with funding support **>1 million MOP**
 - Received the **first collaborative research grant** as **PI**, funded by government grants from both **Macau and Portugal**
- Graduate students supervised/co-supervised: **26** Master (**20** graduated) and **18** PhD (**7** graduated).
- Distinguished Lecturer for both **IEEE SSCS** and **CASS**.
- Guest Editor of JSSC (2021), IEEE Access (2021), and JLPEA (2012).
- **26** invited talks/seminars in both international/local events.
- Organizing Committee, Technical Co-Chair, Technical Program Committee and Review Committee in international conferences:
 - IEEE International Solid-State Circuits Conference (ISSCC), 2017 – Present.
 - IEEE Asian Solid-State Circuits Conference (ASSCC), 2019
 - IEEE Asia and South Pacific Design Automation Conference (ASPDAC), 2016.
 - IEEE TENCON, 2016.
 - IEEE Symposium on Circuits and Systems (ISCAS), 2012 – Present.
 - IEEE Biomedical Circuits and Systems Conference (BioCAS), 2012 – Present.

Teaching Achievements

- Coordinator for the curriculum in State-Key Laboratory of Analog and Mixed-Signal VLSI (AMSV), responsible for shaping the AMSV course developments, curriculum innovation and research.
- Developed from scratch an undergraduate course “*Analog Integrated Circuit Design*”. The course is designed to provide engineering students to integrated circuit design through both theoretical and practical teaching approach.
- Developed a postgraduate course “*Microelectronic Circuit Design*”. This course is targeting on the fundamentals of integrated circuit design, together with in-depth circuit level discussions and practical projects.
- Introduced new courses “*Fundamentals of Internet of Things*” and “*Internet of Things Workshop*” for undergraduate design students.
- Graduate students supervised/co-supervised: **26** Master (**20** graduated) and **18** PhD (**7** graduated).
- Supervised/Co-Supervised **15** bachelor FYP students.

Service Merits

Professional Service

- *Guest Editor* of special issue on “International Solid-State Circuits Conference, 2021” for IEEE Journal Solid-State Circuits, 2021

- *Guest Editor* of special issue “Energy Harvesting Technologies for Wearable and Implantable Devices” for IEEE Access (2021)
- *ISSCC Far East Chair* for ISSCC, 2023 – Present
- *ISSCC Far East Vice Chair* for ISSCC, 2022 – 2023
- *International Technical Program Committee Member* for ISSCC, 2017 – Present
- *Distinguished Lecturer* of IEEE Solid-State Circuits Society (SSCS), 2019 – 2021
- *Distinguished Lecturer* of IEEE Circuits and Systems Society (CASS), 2018 – 2021
- *Technical Member* of IEEE CASS Sensory Systems Technical Committee, 2012 – Present
- *Technical Member* of IEEE CASS Biomedical and Life Science Circuits and Systems Technical Committee, 2012 – Present
- *Organizing Committee Member* of IEEE ASSCC, 2019
- *Chair* of IEEE SSCS Macau Chapter, 2017-2019
- *Senior Member* of IEEE, 2016 – Present
- *TPC/RC member* of top international conferences such as IEEE Asia and South Pacific Design Automation Conference 2015 – 2016, IEEE Symposium on Circuits and Systems 2012 – 2020, IEEE Biomedical Circuits and Systems Conference 2012 – 2019, IEEE Asia Symposium on Quality Electronic Design 2012 – 2014, International Symposium on Integrated Circuits 2014, etc.
- *Reviewer of international journals* including IEEE Journal of Solid-State Circuits, IEEE Transactions on Biomedical Circuits and Systems, IEEE Transactions on Circuits and Systems-I & II, IEEE Transactions on Very Large Scale Integration Systems, IEEE Transactions on Electron Device, IEEE Sensors Journal, etc.

University Service

- *Member of Research Committee* for UM, 2019 – Present
- *Member of Health and Safety Committee* for UM, 2021 – Present
- *Member of Panel on Academic Equipment Committee* for UM, 2022 – Present
- *Ad-hoc member* for RAP review for UM
- *Ad-hoc member* for patent review for UM
- *Lab Infrastructure Coordinator* of IME for organizing the future research and infrastructure development, 2019 – Present
- *Member of Pedagogic Committee* of IME, 2019 – Present
- *Ad-hoc committee member* for the Academic Promotion, Academic Staff Recruitment and Macau Fellow Selection in IME, 2014 – Present
- *Oral Defense Examination Committee Member*, PhD Thesis Proposal Assessment Committee Member, and PhD Qualifying Examination Committee Member for >20 PhD students, 2017 – Present
- *Co-organizer* of IME Summer Camp, 2019
- *Program Reform Committee Member* of FST-ECE for developing the “Internet of Things” discipline, and developed two new IoT courses for FST-ECE, “ECEN3024 – Fundamentals of Internet of Things” and “ECEN3025 – Internet of Things Workshop”, 2017 – 2019
- *Member of Board of Internal Examiner* of FST-ECE for evaluating the quality of courses, 2018 – Present
- *Academic Council Member* of FST-ECE, 2012 – Present
- *Mentor* for undergraduate students of FST-ECE, 2017 – Present
- *Final year project supervisor* for undergraduate students of FST-ECE, 2019 – Present
- *Non-resident fellow* in Moon Chun Memorial College (MCMC)

1. Professional Profile

1.1 Research Interests

Sensors and Sensor Interfaces	CMOS temperature sensors, CMOS image sensors, CMOS sensor interface/readout circuits, energy efficient analog circuits
Energy Management Circuits	Photovoltaic/Piezoelectric integrated energy harvesting circuits and systems, Switched-Capacitor Power Converter
Digital Microfluidic Systems	High-throughput system, superwettability, single cell isolation, on-chip sensing and detection

1.2 Academic Qualifications

Sept 2006	Apr 2011	Doctor of Philosophy in Electronic and Computer Engineering Hong Kong University of Science and Technology (HKUST) Dissertation: <i>Ultra-Low Power/Energy Harvesting CMOS Sensor Designs in Wireless Sensing Platforms</i>
Sept 2003	Nov 2006	Bachelor of Science in Computer Engineering Hong Kong University of Science and Technology (HKUST) <i>Graduated with Academic Achievement Award (First Class Honor)</i>

1.3 Professional Experience

Aug 2023	Present	Professor Institute of Microelectronics, University of Macau
Aug 2017	Present	Associate Professor Analog and Mixed-Signal VLSI (AMSV), University of Macau
Apr 2014	Apr 2016	Adjunct Assistant Professor Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology (HKUST)
Aug 2011	Aug 2017	Assistant Professor Analog and Mixed-Signal VLSI (AMSV), University of Macau
Feb 2011	Aug 2011	Visiting Assistant Professor Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology (HKUST)

1.4 Awards

Oct 2022	Macau Science and Technology Invention Award (3rd Class) , Science and Technology Development Fund (FDCT), 2022
Oct 2020	Macau Science and Technology Invention Award (1st Class) , Science and Technology Development Fund (FDCT), 2020
Jun 2020	Best Final Year Project Award (student: Tianzheng Yan), ECE Dept., University of Macau, 2020
Sep 2019	MicroTAS Travel Grant Award (student: Mingzhong Li), Applied Science (MDPI), 2019
Oct 2018	Macau Science and Technology Invention Award (2nd Class) , Science and Technology Development Fund (FDCT), 2018

Feb 2018	ISSCC Predoctoral Achievement Award (student: Yang Jiang), IEEE Solid-State Society, 2018
Oct 2017	Synopsys Award (student: Ka Chon Lei, Hou Man Leong), Synopsys Macau, 2017
Jun 2017	Best Final Year Project Award (student: Ka Chon Lei, Hou Man Leong), ECE Dept., University of Macau, 2017
Feb 2017	ISSCC Student Travel Grant Award (student: Tan-Tan Zhang), IEEE Solid-State Society, 2017
Feb 2016	ISSCC Silkroad Award (student: Ka-Meng Lei), IEEE International Solid-State Circuits Conference, 2016
Feb 2016	ISSCC Student Travel Grant Award (student: Chio-In Jeong), IEEE Solid-State Society, 2016
Jan 2016	Best Design Award (student: Bo Wang), Asia and South Pacific Design Automation Conference, 2016
Nov 2015	A-SSCC Distinguished Design Award (student: Ka-Meng Lei), IEEE Asian Solid-State Circuits Conference, 2015
Feb 2015	ISSCC Student Travel Grant Award (student: Ka-Meng Lei), IEEE Solid-State Society, 2015
Oct 2014	Macau Science and Technology Invention Award (2nd Class) , Science and Technology Development Fund (FDCT), 2014
Aug 2013	Student Paper Award (student: Ka-Meng Lei), IEEE International Society for Quality Electronic Design – ISQED, 2013

1.5 Key Research Achievement Statistics

	Career	
	Published/ Accepted	Under Review/ In Preparation
Referred Journal Papers (SCI)	102	2
Conference Papers	73	1
U.S. + Chinese Patents	15	2
Book + Book Chapter	1 + 2	
Best Paper Awards + Student Awards	16	
Invention Awards	4	
Research Grants (Internal + External + Industry)	Total: 18 [14 PI + 4 Co-PI] (7 + 10 + 1)	
Research Grant Amounts (PI)	Total: MOP ~19.7M	
International Invited Talks/Seminars	28	
Postdoc Fellow	4	
Graduate Students	18 PhD + 25 Master (graduated 7 PhD + 20 Master)	

2. Professional Activities

2.1 Professional Editorship

2021	2021	Guest Editor , IEEE JSSC
2020	2021	Guest Editor , IEEE Access
2012	2013	Guest Editor , Journal of Low Power Electronics and Applications

2.2 Professional Services

2017	Present	ISSCC TPC Member , ISSCC
2023	Present	ISSCC Far East Chair , ISSCC
2022	2023	ISSCC Far East Vice Chair , ISSCC
2020	2021	Distinguished Lecturer , IEEE Solid-State Circuits Society (SSCS)
2019	2021	Distinguished Lecturer , IEEE Circuits and Systems Society (CASS)
2012	Present	Technical Committee Member , IEEE Circuits and Systems Society (CASS) Sensory Systems Technical Committee
2012	Present	Technical Committee Member , IEEE Circuits and Systems Society (CASS) Biomedical Circuits and Systems Technical Committee
2016	Present	Senior Member , IEEE
2022	Present	Judge , Competition for the Youth Innovation Challenge, Macao Science and Engineering Fair
2022	2022	Judge , IEEE Macau Student Branch Undergraduate Project Competition
2022	2022	Judge , IEEE IES Undergraduate Project Competition
2019	2019	Organizing Committee Member , IEEE ASSCC
2017	2019	Chair , IEEE SSCS Macau Chapter
2013	2013	Judge , IEEE Macau Project Competition, Macao
2012	2013	Mentor , Faculty Mentorship Program, University of Macau, Macao

2.3 Academic and Industrial Research Collaboration

2022	Present	Project Consultant , ePhoton Co. Ltd.
2012	2016	Project Leader of UM Team , Hong Kong University of Science and Technology
2012	2016	Project Leader of UM Team , Nara Institute of Science and Technology, Japan
2013	2014	Technical Consultant , Solomon Systech, Hong Kong
2011	2012	Technical Consultant , Joint RFID Project with Zhejiang Government and Hong Kong University of Science and Technology (HKUST)

2011	2011	Project Member , with Hong Kong Applied Science and Technology Research Institute Company Ltd. (ASTRI) and Hong Kong University of Science and Technology, Hong Kong
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2.4 International Conference Technical Program Committee/Review Committee

2023	Present	ISSCC Far East Chair , ISSCC
2017	Present	ISSCC TPC Member , ISSCC
2020	2022	Distinguished Lecturer , IEEE Solid-State Circuits Society (SSCS)
2019	2022	Distinguished Lecturer , IEEE Circuits and Systems Society (CASS)
2012	Present	Review Committee Member , ISCAS
2012	Present	Review Committee Member , BioCAS
2017	2019	Chair , IEEE SSCS Macau Chapter
2015	2016	Technical Co-Chair , ASP-DSC UDC
2015	2015	Session Chair , IEEE TENCON
2014	2014	Review Committee Member , ISIC
2012	2013	Review Committee Member , ASQED
2011	2011	Review Committee Member , PrimeAsia

2.5 Referee of Journals

IEEE Journal of Solid-State Circuits
 IEEE Transactions on Biomedical Circuits and Systems
 IEEE Transactions on Circuits and Systems-I
 IEEE Transactions on Circuits and Systems-II
 IEEE Transactions on Very Large Scale Integration (VLSI) Systems
 IEEE Transactions on Electron Device
 IEEE Electron Device Letters
 IEEE Sensors Journal
 IET Electronic Letters

2.6 Referee of Conferences

IEEE Symposium on Circuits and Systems, ISCAS
 IEEE Biomedical Circuits and Systems Conference, BioCAS
 IEEE Asia and South Pacific Design Automation Conference, ASPDAC
 IEEE Asia Symposium on Quality Electronic Design, ASQED
 IEEE Asia Pacific Conference on Postgraduate Research in Microelectronics and Electronics, PrimeAsia
 IEEE International Symposium on Integrated Circuits, ISIC

3. Teaching and Thesis Supervision

3.1 Undergraduate Courses

2022	Present	ECEN3025	IoT Workshop
2021	Present	ECEN3024	Fundamentals of Internet of Things
2018	Present	ECEN4000	Graduation Project I

2018	Present	ECEN4001	Graduation Project I
2018	2020	ECEN3017	Analog Integrated Circuit Design
2013	2018	ECEB368	Analog Integrated Circuit Design
2013	2018	ECEB410	Design Project I
2013	2018	ECEB420	Design Project II
2013	2014	ELEC401	Design project I
2013	2014	ELEC402	Design project II
2012	2014	ELEC371	Analog Integrated Circuit Design

3.2 Postgraduate Courses

2018	Present	ECEN7001	Introduction to Research
2018	Present	ECEN7999	Academic Thesis
2018	2020	ECEN7003	Microelectronic Circuit Design
2013	2018	ELCE704	Microelectronic Circuit Design
2013	2018	ELCE701	Introduction to Research
2013	2018	ELCE799	Thesis
2012	2013	IMSE001	Introduction to Research
2012	2013	IMSE999	Thesis
2011	2012	IMSE004	Microelectronic Circuit Design

3.3 Postdoc/RA Supervision

2022	Present	<u>Jiangchao WU</u> Topic: <i>High performance CMOS Vision Sensor System</i>
2022	Present	<u>Bei LONG</u> Topic: <i>High efficiency battery technology for next generation IoT systems</i>
2019	2020	<u>Yang JIANG</u> Topic: <i>Multi-Voltage Conversion Ratio Switched-Capacitor DC-DC Converter With Fast Transient Response</i>
2015	2017	<u>Kwan Ting NG</u> Topic: <i>Energy Harvesting Motion Tracking CMOS Image Sensor</i>

3.4 PhD Supervision/Co-Supervision/Mentor

2022	Present	<u>Chenxi WANG</u> Thesis: <i>High Performance Switched-Capacitor AC/DC Converter</i>
2022	Present	<u>Zhao WANG</u> Thesis: <i>High Performance Time-of-Flight Systems</i>
2022	Present	<u>Yifei XIANG</u> Thesis: <i>High Performance Processing for Time-of-Flight Systems</i>
2023	Present	<u>Qiaobo MA</u> Thesis: <i>High-Step-Down DC-DC Converter Design</i>
2023	Present	<u>Xiongjie ZHANG</u> Thesis: <i>Hybrid DC-DC Converter Design</i>
2021	Present	<u>Ke HU</u> Thesis: <i>High Efficiency Biosensor Readout Circuits</i>
2020	Present	<u>Li MENG</u> Thesis: <i>Biosensor design for digital microfluidics (DMF) systems</i>
2019	Present	<u>Guangshu ZHAO</u> Thesis: <i>Piezoelectric Energy Harvesting Circuits and Systems</i>

2019	Present	<u>Chongyao XU</u> Thesis: <i>Energy Efficient CMOS Security Circuits and Systems</i>
2019	Present	<u>Chi Wah U</u> Thesis: <i>Energy Efficient High Accuracy CMOS Bandgap Reference</i>
2017	Present	<u>Zhaobo ZHANG</u> Thesis: <i>High Efficiency Wireless Power Transfer System</i>
2016	2022	<u>Xin LU</u> Thesis: <i>Ultra-Fast High Resolution SPAD Imager for Fluorescence Lifetime Imaging</i> First Job: <i>ePhoton Co. Ltd., Zhuhai, China</i>
2016	2021	<u>Jiangchao WU</u> Thesis: <i>Energy Efficient Motion Detection CMOS Image Sensor</i> First Job: <i>Postdoc Fellow, University of Macau, China</i>
2015	2020	<u>Mingzhong LI</u> Thesis: <i>Patterned Surface Wettability and Advanced Droplet Manipulation Techniques for Disease Diagnostics using Digital Microfluidics</i> First Job: <i>Postdoc Fellow, University of Macau, China</i>
2012	2019	<u>Yang JIANG</u> Thesis: <i>Energy Efficient Reconfigurable CMOS Integrated DC-DC Converter Design</i> First Job: <i>Postdoc Fellow, University of Macau, China</i>
2013	2018	<u>Zhiyuan CHEN</u> Thesis: <i>Energy Efficient Power Management Design for Energy Harvesting Applications</i> First Job: <i>Postdoc Fellow, Fudan University, China</i>
2010	2018	<u>Tantan ZHANG</u> Thesis: <i>Nano-Watt-Class CMOS Analog Circuits</i> First Job: <i>Research Associate, A*Star, Singapore</i>
2012	2015	<u>Bo WANG</u> Thesis: <i>Voltage Reference/Incremental Data Converter Designs for Low-cost CMOS Temperature Sensor</i> First Job: <i>Assistant Professor, Hamad Bin Khalifa University</i>
2012	2016	<u>Ka-Meng LEI</u> Thesis: <i>Handheld CMOS-Based NMR Devices for Biological/Chemical Diagnosis</i> First Job: <i>Macau Fellow, University of Macau, China</i>
2011	2016	<u>Jung-Ho LEE</u> Thesis: <i>Design and Analysis of a Multi-Channel Power-Supply Modulated Micro-Stimulator with Energy Recycling</i> First Job: <i>Senior Engineer, Samsung, Korea</i>
2010	2015	<u>Yaohua ZHAO</u> Thesis: <i>Low-Power High-Linearity and Area-Efficient Switched Capacitor Filters Design Techniques in Nanoscale CMOS</i> First Job: <i>Senior Engineer, Qualcomm, Singapore</i>
2009	2016	<u>Chio-In IEONG</u> Thesis: <i>Low-Power CMOS Processors Design for ECG QRS Wave Detection and Data Compression</i> First Job: <i>Senior Engineer, Hi-Silicon, Shenzhen, China</i>
2009	2014	<u>Zushu YAN</u>

Thesis: *Systematic Design and Implementation of Single-stage and Multi-stage CMOS Amplifiers*

First Job: *Senior Engineer, Broadcom, USA*

3.5 MSc Supervision/Co-Supervision/Mentor

2022	Present	Xuanlin CHEN Thesis: <i>Ultra-low Power Analog Circuits and System</i>
2021	Present	<u>Litao ZHANG</u> Thesis: <i>High Performance Hardware Security Circuits and Systems</i>
2021	Present	<u>Qishen FANG</u> Thesis: <i>High Efficiency CMOS High Voltage Driver Design</i>
2021	Present	<u>Yaqian ZHAO</u> Thesis: <i>Precision Analog Circuit Design</i>
2021	Present	<u>Yifan ZHU</u> Thesis: <i>High Efficiency Digital Logic Design</i>
2019	Present	<u>Yangyang LIU</u> Thesis: <i>High Accuracy CMOS Sensor Interface Design</i>
2020	2023	<u>Yu JIA</u> Thesis: <i>High Efficiency Single-Chip Energy Harvesting System</i>
2020	2022	<u>Ruijie ZHAO</u> Thesis: <i>High Voltage Driver Design</i>
2020	2022	<u>Qiaobo MA</u> Thesis: <i>Design and Implementation of Heavy-Load-Efficient Integrated Multi-Path Switched-Capacitor-Inductor Hybrid DC-DC Converter</i> First Job: PhD Candidate, AMSV, University of Macau, China
2020	2022	<u>Xiongjie ZHANG</u> Thesis: <i>High-Step-Down Hybrid DC-DC Converter Techniques for Heavy-Load Efficiency Improvement and Output EMI Reduction</i> First Job: PhD Candidate, AMSV, University of Macau, China
2019	2022	<u>Yu LEI</u> Thesis: <i>High Accuracy CMOS Temperature Sensor Design</i> First Job: Engineer, Awinic Co. Ltd., Shanghai
2018	2021	<u>Jieyun ZHANG</u> Thesis: <i>CMOS Security Circuits and Systems</i> First Job: Engineer, Hisilicon Co. Ltd., Shenzhen
2017	2020	<u>Hou Man LEONG</u> Thesis: <i>High Efficiency CMOS Switched-Capacitor DC-DC Converter</i> First Job: Engineer, Akrostar Co. Ltd., Macau
2017	2020	<u>Chuanqi WEI</u> Thesis: <i>Low Complexity Template-Model-Based Motion Vector Detection for CMOS Image Sensor</i> First Job: Engineer, Cambricon Co. Ltd., Shenzhen
2017	2020	<u>Ka Chon LEI</u> Thesis: <i>Fully Integrated High Voltage Pulse Driver Using Switched-Capacitor Voltage Multiplier and Synchronous Charge Compensation in 65-nm CMOS</i> First Job: Research Assistant, AMSV, University of Macau, Macau
2016	2019	<u>Yukun XU</u>

		Thesis: <i>Curvature Compensated BJT-based Time-Domain CMOS Temperature Sensor Design</i> First Job: <i>Engineer, Sino Microelectronics Technology Co. Ltd., Chengdu, China</i>
2015	2019	<u>Ruping XIAO</u> Thesis: <i>Wavelet Transform-based Ultra-low Power High Accuracy QRS Detector for Wearable ECG Monitoring Applications</i> First Job: <i>Engineer, NVidia, Shanghai, China</i>
2015	2018	<u>Dapeng SUN</u> Thesis: <i>Process Compensated CMOS Temperature Sensor Exploiting Piecewise Base Recombination Current</i> First Job: <i>IT Engineer, Bank of China, Shanghai, China</i>
2015	2018	<u>Baoyi CEN</u> Thesis: <i>Switched-Capacitor DC-DC Converter with Fixed Output Spectrum Modulation for Noise-sensitive IoT Application</i> First Job: <i>Engineer, China Electric Power Equipment and Technology Co., Ltd. (CET), China</i>
2013	2016	<u>Sanfeng LU</u> Thesis: <i>High Accuracy Multi-range Ultra-low Power/Non-calibrated CMOS Smart Temperature Sensor Design</i> First Job: <i>Design Engineer, Jia Chi Microelectronics Tech. Co., Ltd, Xiamen, China</i>
2012	2015	<u>Suyan FAN</u> Thesis: <i>A Wide-Input-Range Supply Voltage Tolerant Capacitive Sensor Readout using On-Chip Solar Cell</i> First Job: <i>Engineering, AllWinner Technology, Zhuhai, China</i>
2011	2014	<u>Jiangchao WU</u> Thesis: <i>An Ultra-Low Power Acquisition Frontend for Neural Recording</i> First Job: <i>Research Assistant, AMSV, University of Macau, China</i>
2011	2014	<u>Mingzhong LI</u> Thesis: <i>Sub-threshold Standard Cell Library Design for Ultra-low Power Biomedical Applications</i> First Job: <i>PhD Candidate, AMSV, University of Macau, China</i>
2011	2013	<u>Zhiyuan CHEN</u> Thesis: <i>Single-Chip Solar Energy Harvesting IC with Integrated Solar Cells for Biomedical Application</i> First Job: <i>PhD Candidate, AMSV, University of Macau, China</i>
2011	2013	<u>Tao WU</u> Thesis: <i>An Ultra-Low-Power CMOS Smart Temperature Sensor for Clinical Temperature Monitoring</i> First Job: <i>Emporean Ltd., Beijing, China</i>
2010	2012	<u>Bo WANG</u> Thesis: <i>Power-efficient solid-state smart CMOS sensors for RFID applications</i> First Job: <i>PhD Candidate, HKUST, China</i>

3.6 Bachelor FYP/Research Students (Supervision/Co-Supervision)

2021	---	<u>Hanqi ZHANG</u> Project: <i>High Performance CMOS Bandgap Voltage Reference</i>
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2021	---	<u>Ka Seng HOI</u> Project: <i>Ultra-low Power Current Reference Design in CMOS</i>
2021	---	<u>Wai CHEN</u> Project: <i>Ultra-low Power Current Reference Design in CMOS</i>
2020	---	<u>Litao ZHANG</u> Project: <i>High Performance Switched-Capacitor DC-DC Converter</i>
2020	---	<u>Shuqi ZHAO</u> Project: <i>High Performance Switched-Capacitor DC-DC Converter</i>
2020	---	<u>Yang WANG</u> Project: <i>High Performance CMOS Bandgap Voltage Reference</i>
2019	---	<u>Tianzheng YAN</u> Project: <i>A -40°C to 180°C, 1.58 ppm/°C, 1.3μW Bandgap Voltage Reference with Segmented Curvature Compensation</i>
2018	---	<u>Chi-Wah U</u> Project: <i>Ultra-low Power High Accuracy Bandgap Reference Circuit</i>
2017	---	<u>Tianxiao XIE</u> Project: <i>High Efficiency Piezoelectric Energy Harvesting Interface</i>
2016	---	<u>Ka-Chon LEI</u> Project: <i>Fully Integrated High Voltage MEMS Drivers in CMOS</i>
2016	---	<u>Hou-Man LEONG</u> Project: <i>Fully Integrated High Voltage MEMS Drivers in CMOS</i>
2013	---	<u>Xingqian YANG</u> Project: <i>Wireless ECG Sensing Platform</i>
2013	---	<u>Meng XU</u> Project: <i>Wireless ECG Sensing Platform</i>
2013	---	<u>Long-Wai CHAN</u> Project: <i>Wireless ECG Sensing Platform</i>
2013	---	<u>Pu BAI</u> Project: <i>Low-Noise High-Accuracy CMOS Temperature Sensor Design</i>

4. Research Activities

4.1 Research Grants (14 grants as Principle Investigator with ~MOP 19.7M, USD ~2.5M)

1. **Co-PI**, “Research on Key Circuit Technologies for Future Intelligent Mobile Robots,” Macao FDCT Key Project, 2023-2026. (MOP 11,974,000)
2. **PI**, “Lightweight and High Security Hybrid Strong PUF for Low-Power IoT Applications,” Macao FDCT, 2023-2026. (MOP 2,242,000)
3. **PI**, “High efficiency single-input-multiple-output (SIMO) switched-capacitor (SC) DC-DC converter capable of fast DVS operation and load-dependent dynamic power allocation,” MYRG of University of Macau, 2024-2026. (MOP 320,000)
4. **PI**, “High Efficiency Versatile Piezoelectric Vibration Energy Harvesting System for Structural Health Monitoring,” MYRG of University of Macau, 2023-2024. (MOP 544,000)
5. **Co-PI**, “Research and Development on Inductor-Reused Single-Input-Multiple-Output (SIMO) DC-DC Converters IC Techniques for Low-Power IoT Devices,” MYRG of University of Macau, 2023-2024 (MOP 432,000)
6. **PI**, “Research and Development on dTOF Sensing System” ePhoton Co. Ltd., 2022-2023 (MOP 470,000)

7. **PI**, “Research and Development on Ultra-Compact Energy Harvesting Power Management IC for mm-Scale Internet of Things,” Macao FDCT, 2021-2024. (MOP 1,987,000)
8. **Co-PI**, “Research and Development of Integrated GaN-Assisted Hybrid DC-DC Converter”, Macao FDCT, 2021-2024. (MOP 884,000)
9. **PI**, “SeaSenseX - Next-generation microsensors for marine mutagens and carcinogens,” Macau-Portugal FDCT- FCT Joint Scientific Research Project, 2020-2022. (MOP 1,000,000)
10. **PI**, “Fully-Integrated Fine-Grained Switched-Capacitor DC-DC Converters with High Power Density for Energy Harvesting Applications,” MYRG of University of Macau, 2018-2021. (MOP 1,391,500)
11. **PI**, “High Dynamic Range Motion Direction Detection CMOS Imager with Energy Harvesting Capability,” Macao FDCT, 2017-2020. (MOP 1,365,000)
12. **PI**, “High-throughput Fully-Automated Cell Culture/Assay Digital Microfluidics Platform,” MYRG of University of Macau, 2017-2020. (MOP 1,471,500)
13. **Co-PI**, “Study and Design of DC-DC KY Boost Converters in Nanoscale CMOS Technology,” Macao FDCT, 2017-2020. (MOP 1,200,000)
14. **PI**, “Energy Efficient Miniaturized Multi-Sensing Platform in CMOS,” MYRG of University of Macau, 2015-2017. (MOP 2,970,000)
15. **PI**, “Energy Management IC Design with Temperature Monitoring for Biomedical Implants,” MYRG of University of Macau, 2013-2016. (MOP 1,350,000)
16. **PI**, “Ultra-Low Power Solar-Powered CMOS Biomedical Implantable Sensing Chip capable of Bi-Directional Communication,” Macao FDCT and RC of University of Macau, 2013-2015. (MOP 2,360,000 + MOP 780,000)
17. **PI**, “Towards High Performance Retinal Prosthesis (Phase I) – Multiple Energy Source Image-Based Retinal Prosthesis with Closed-Loop Temperature Control,” MYRG of University of Macau, 2012-2015. (MOP 1,346,000)
18. **PI**, “Energy Harvesting CMOS Image Sensor Design with On-Chip Power Management Unit,” SRG of University of Macau, 2011-2013. (MOP 100,000)

4.2 Invited Talks/Seminars

1. “A 93.4% Peak Efficiency C_{LOAD} -Free Multi-Phase Switched-Capacitor DC–DC Converter Achieving a Fast DVS up to 222.5 mV/ns,” **IEEE ICAC Workshop**, Mar. 2024.
2. "Towards High Efficiency Rational Switched-Capacitor Power Converter Topologies" **IEEE SSCS Webinar**, Online, Jun. 2022.
3. "Switched-Capacitor Power Converter for Miniaturized Energy Harvesting Systems," **Southeast University**, Invited Talk Series, Online, May 2022.
4. “High Efficiency Reconfigurable Monolithic Switched-Capacitor DC-DC Converter,” **IEEE SSCS Egypt Chapter DL**, Online, Oct. 2021.
5. “High Efficiency Reconfigurable Monolithic Switched-Capacitor DC-DC Converter,” **IEEE SSCS Switzerland Chapter DL**, Online, Oct. 2021.
6. “High Efficiency Reconfigurable Monolithic Switched-Capacitor DC-DC Converter,” **IEEE SSCS Delhi Chapter DL**, Online, Oct. 2021.

7. "Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors for Passive RFID Applications," **IEEE CASS Malaysia Chapter DL**, Online, Oct. 2021.
8. "High Efficiency Reconfigurable Monolithic Switched-Capacitor DC-DC Converter," **Zhejiang University**, Hangzhou, China, Jul. 2021.
9. "High Efficiency Reconfigurable Monolithic Switched-Capacitor DC-DC Converter," **IEEE SSCS Chengdu Chapter DL**, UESTC, Chengdu, China, Jul. 2021.
10. "Capacitive Power Management Circuits for Miniaturized Energy Harvesting IoT Systems," **IEEE Symposium on VLSI Circuits (VLSI-C)**, Online, Jun. 2021.
11. "Capacitive Piezoelectric Energy Harvesting Techniques" **UESTC**, Chengdu, China, Jul. 2021.
12. "Switched-Capacitor DC-DC Converter: An Algorithmic Topology Generation Approach," **IEEE CASS Virtual DL**, Online, Sep. 2020.
13. "Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors for Passive RFID Applications," **IEEE SSCS Switzerland Chapter DL**, Online, Jul. 2020.
14. "Fully-Integrated Algebraic Series-Parallel-Based Reconfigurable Switched-Capacitor DC-DC Boost Converter," **IEEE ICAC**, Keynote Speech, Online, Jun. 2020.
15. "Capacitive Sensor Interfaces," **IEEE ISSCC**, San Francisco, CA, Feb. 2020.
16. "Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors for Passive RFID Applications," **IEEE CASS Shenzhen Chapter DL**, Shenzhen University, Shenzhen China, Nov. 2019
17. "Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors for Passive RFID Applications," **IEEE CASS Portugal Chapter DL**, Universidade Nova de Lisboa, Lisbon, Portugal, Jun. 2019.
18. "Ultra-low Power/Energy Harvesting CMOS Sensing Circuits and Systems," **International Iberian Nanotechnology Laboratory**, Braga, Portugal, Mar. 2019.
19. "Ultra-low Power/Energy Harvesting CMOS Sensing Circuits and Systems," **CENIMAT|i3N**, Lisbon, Portugal, Feb. 2019.
20. "Micro-Power Monolithic Switched-Capacitor Energy Harvesting Interface," **IEEE Symposium on Circuits and Systems (ISCAS)**, Florence, Italy, May 2018.
21. "Fully Integrated Flipping-Capacitor Rectifier for Piezoelectric Energy Harvesting", **IEEE CAS Workshop**, South China University of Technology, China, Nov. 2017.
22. "Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors", **IEEE CAS Society Seasonal School**, Macau, Aug. 2017.
23. "An Ultra-Low-Power CMOS Smart Temperature Sensor for Clinical Temperature Monitoring," **Solomon Systech**, China, Nov. 2013.
24. "Sensor Enabled UHF Passive RFID for Wireless Monitoring Application," **International Symposium on VLSI for Short-Range Wireless Communications**, Japan, Nov. 2012.
25. "Sensor Enabled UHF Passive RFID for Wireless Monitoring Application," **Nara Institute of Science and Technology**, Japan, Nov. 2012.
26. "Ultra-Low Power CMOS Temperature Sensor in passive RFID Tag," **Solomon Systech**, Hong Kong, Oct. 2012.
27. "Biomedical CMOS Circuits," General Seminar of **University of Macau**, Macau, Sept. 2012.

4.3 Conference Presentations

1. G. Zhao, **M. K. Law**, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Feb. 2023.
2. J. Wu, **M. K. Law**, P. I. Mak and R. P. Martins, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Feb. 2021.
3. X. Zhong, A. Bermak, C. Y. Tsui and **M. K. Law**, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Feb. 2018.
4. Y. Jiang, P. I. Mak, R. P. Martins and **M. K. Law**, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Session 3, Paper No. 1, Feb. 2017.
5. T. Zhang, **M. K. Law**, P. I. Mak, R. P. Martins and M. I. Vai, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Session 1, Paper No. 3, Feb. 2017.
6. C. I. Jeong, M. Li, **M. K. Law**, P. I. Mak, M. I. Vai, R. P. Martins, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Session 2, Paper No. 3, Feb. 2016. [ISSCC Student Travel Grant Award]
7. K. M. Lei, P. I. Mak, **M. K. Law** and R. P. Martins, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Session 2, Paper No. 1, Feb. 2015. [ISSCC Student Travel Grant Award]
8. Y. Zhao, P. I. Mak, **M. K. Law** and R. P. Martins, “Student Research Preview,” *IEEE International Solid-State Circuit Conference (ISSCC)*, Session 2, Paper No. 8, Feb. 2014.

5. Publications

5.1 Patents/Inventions

1. H. Li, Q. Ma, Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “一种适用于混合式开关电容直流-直流转换器的自适应输入瞬态响应增强技术,” Chinese Patent, UMPT512-2022.
2. X. Mu, Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “一种基于开关电容的栅极驱动电路技术,” Chinese Patent, UMPT511-2022.
3. Q. Ma, X. Zhang, Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “一种具有低导通损耗特性的开关电容-电感混合式直流-直流转换器拓扑结构,” Chinese Patent, UMPT493-2022.
4. X. Zhang, Q. Ma, Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “一种双电感-多路径混合型直流-直流转换器拓扑结构,” Chinese Patent, UMPT492-2022.
5. Q. Ma, X. Zhang, Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “直流转换器及电子设备,” Chinese Patent, UMPT411-2021.
6. Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, “一种自适应自举式浮动开关驱动电路,” Chinese Patent, UMPT401-2021.
7. M. Li, L. Wan, **M. K. Law**, L. Meng, Y. Jia, P. I. Mak and R. P. Martins, “一种数字微流控器件及高分辨率溶解曲线分析的方法,” Chinese Patent, UMPT397-2021.
8. C. W. U, C. F. Lee, **M. K. Law**, C. S. Lam, R. P. Martins, “电流模带隙基准电压源的校准电路,” Chinese Patent, ZL.2021.1.1304187.0.
9. Z. Chen, **M. K. Law**, P. I. Mak, R. P. Martins, “Flipping-Capacitor Rectifier Circuit,” US Patent Application no. US 15/821,862, Nov. 2017.

10. K. M. Lei, P. I. Mak, **M. K. Law**, R. P. Martins, “Palm-Size μ NMR Relaxometer Using a Digital Microfluidic Device and a Semiconductor Transceiver for Chemical/Biological Diagnosis,” US Patent, Application no. US 14/881,889, Oct. 2015.
11. K. M. Lei, P. I. Mak, **M. K. Law**, R. P. Martins, “Modular Nuclear Magnetic Resonance–Digital Microfluidic System for Biological Assays,” US Patent, Application no. US 14/881,615, Oct. 2015.
12. Z. Yan, P. I. Mak, **M. K. Law**, R. P. Martins, “Frequency Compensation Techniques for Low-Power and Small-Area Multistage Amplifiers,” US Patent, Application no. 13/770,020, Feb. 19, 2013.
13. **M. K. Law**, A. Bermak, H. C. Luong, “Low voltage low power sub-threshold CMOS temperature sensor circuit”, US Patent 8,931,953, Jan. 13, 2015.
14. **M. K. Law**, A. Bermak, H. C. Luong, “低電壓低功耗亞閾值電路 CMOS 溫度傳感器”, Chinese Patent ZL 201110141653.8, Aug. 6, 2014.
15. C. Shi, **M. K. Law**, A. Bermak, “Method and Apparatus for Energy Harvesting using CMOS Sensor”, US Patent 8,629,386, Jan. 14, 2014.

5.2 Book/Book Chapters

1. K. M. Lei, P. I. Mak, **M. K. Law**, R. P. Martins, “Handheld Total Chemical and Biological Analysis Systems,” Sprinkler, 2018.
2. **M. K. Law**, “Ultra-low Power/Energy Efficient High Accuracy CMOS Temperature Sensors,” Selected Topics in Power, RF, and Mixed-Signal ICs, pp. 229-266, Dec. 2017.

5.3 Referred Journals

1. J. Zhang, C. Zhan, S. Zhao, **M. K. Law**, “A High-Efficiency Low-Cost Multi-Antenna Energy Harvesting System With Leakage Suppression,” *IEEE J. Solid-State Circuits*, 2024, accepted.
2. X. Zhang, A. Zhao, Q. Ma, Y. Jiang, **M. K. Law**, R. P. Martins, P. I. Mak, “A 24-V-Input Highly Integrated Interleaved-Inductor Multiple Step-Down Hybrid DC–DC Converter With Inherent Current Equalization Characteristics,” *IEEE J. Solid-State Circuits*, 2024, accepted.
3. M. Liu, Z. Cai, Z. Wang, S. Zhou, **M. K. Law**, J. Liu, J. Ma, N. Wu, L. Liu, “A 3 THz CMOS Image Sensor,” *IEEE J. Solid-State Circuits*, 2024, accepted.
4. X. Zhang, Q. Ma, Y. Jiang, A. Zhao, **M. K. Law**, R. P. Martins, P. I. Mak, “An Outphase-Interleaved Switched-Capacitor Hybrid Buck Converter With Relieved Capacitor Inrush Current and COUT-Free Operations,” *IEEE J. Solid-State Circuits*, vol. 59, no. 4, pp. 1078-1092, Apr. 2024.
5. B. Long, X. Liang, Y. Pei, X. Wu, X. Wang, **M. K. Law**, “Free-standing BiOI@ MWCNTs photoelectrodes for photo-rechargeable zinc-ion batteries,” *J. Materials Science & Technology*, vol. 198, pp. 137-142, Nov. 2024.
6. C. Xu, L. Zhang, P. I. Mak, R. P. Martins, **M. K. Law**, “Fully Symmetrical Obfuscated Interconnection and Weak-PUF-Assisted Challenge Obfuscation Strong PUFs Against Machine-Learning Modeling Attacks,” *IEEE Trans. Inf. Forensics Security*, 2024, accepted.
7. L. Meng, M. Li, Z. Xu, A. Lv, Y. Jia, M. Chen, P. I. Mak, R. P. Martins, **M. K. Law**, “Absolute quantification of nucleic acid on digital microfluidics platform based on superhydrophobic–superhydrophilic micropatterning,” *Sensors and Actuators B: Chemical*, vol. 402, pp. 135079, Mar. 2024.
8. X. Lu, J. Wu, Z. Wang, Y. Xiang, L. Liu, P. I. Mak, R. P. Martins, **M. K. Law**, “A 0.013 mm² 3.2 ns Input Range 10-bit Cyclic Time-to-Digital Converter Using Gated Ring Oscillator With Phase Domain Reset in 65nm CMOS,” *IEEE Trans. Circuits Syst.-II, Exp. Briefs*, 2024, accepted.

9. C. W. U, **M. K. Law**, R. P. Martins, C. S. Lam, "Sub- μ W Auto-Calibration Bandgap Voltage Reference With 1 σ Inaccuracy of $\pm 0.12\%$ Within -40°C to 120°C ," *IEEE J. Solid-State Circuits*, vol. 59, no. 2, pp. 540-550, Feb. 2024.
10. Z. Li, J. Wang, **M. K. Law**, S. Du, J. Liang, X. Cheng, J. Han, X. Zeng, Z. Chen, "Piezoelectric Energy Harvesting Interface Using Self-Bias-Flip Rectifier and Switched-PEH DC-DC for MPPT," *IEEE J. Solid-State Circuits*, 2024, accepted.
11. L. Wan, M. Li, **M. K. Law**, P. I. Mak, R. P. Martins, Y. Jia, "Sub-5-Minute Ultrafast PCR using Digital Microfluidics," *Biosensors and Bioelectronics*, vol. 242, pp. 115711, Dec. 2023.
12. P. Hua, R. Liang, Y. Tu, Y. Yin, **M. K. Law**, M. Chen, "Reactive oxygen species and nitric oxide scavenging nanoparticles alleviating rheumatoid arthritis through adjusting the seeds and growing soils," *Acta Pharmaceutica Sinica B*, vol. 13, no. 12, pp. 5016-5029, Dec. 2023.
13. F. Li, Q. Fang, J. Wu, Y. Jiang, P. I. Mak, R. P. Martins, **M. K. Law**, "A 93.4% Peak Efficiency C_{LOAD} -Free Multi-Phase Switched-Capacitor DC-DC Converter Achieving a Fast DVS up to 222.5 mV/ns," *IEEE J. Solid-State Circuits*, 2024, accepted.
14. Q. Ma, X. Zhang, A. Zhao, H. Li, Y. Jiang, **M. K. Law**, M. Takamiya, R. P. Martins, P. I. Mak, "A 10.5 W, 93% Efficient Dual-Path Hybrid (DPH)-Based DC-DC Converter Incorporating a Continuous-Current-Input Switched-Capacitor Stage and Enhanced I_L Reduction for 12V/24V Inputs," *IEEE Trans. Circuits Syst.-I, Reg. Papers*, vol. 70, no. 12, pp. 5482-5495, Dec. 2023.
15. B. Wang, **M. K. Law**, J. Schneider, "L2min^{2/2s}: Efficient Linear Reconstruction Filter for Incremental Delta-Sigma ADCs," *IEEE Trans. Signal Processing*, vol. 71, pp. 3229-3241, Sep. 2023.
16. X. Zhang, Q. Ma, A. Zhao, Y. Jiang, **M. K. Law**, J. Jiang, M. Takamiya, R. P. Martins, P. I. Mak, "A 12/24 V-Input HV-LV-Separated Hybrid SC PoL Converter with 355 mW/mm³ Power Density at 3 A Load Current and 15.2 mm³ Power Passives," *IEEE Trans. Power Electronics*, vol. 38, no. 12, pp. 15109-15114, Sep. 2023.
17. M. Han, Y. Qian, X. Li, N. Wang, T. Song, L. Liu, X. Wang, X. Wu, **M. K. Law**, B. Long, "Ni-doped Bi₂O₂CO₃ nanosheet with H⁺/Zn²⁺ co-insertion for "rocking chair" zinc-ion battery," *J. Colloid and Interface Science*, vol. 645, pp. 483-492, Sep. 2023.
18. X. Mu, G. Zhao, A. Zhao, Y. Jiang, **M. K. Law**, M. Takamiya, P. I. Mak, R. P. Martins, "Floating-Domain Integrated GaN Driver Techniques for DC-DC Converters: A Review," *IEEE Trans. Circuits Syst.-I, Reg. Papers*, vol. 70, no. 9, pp. 3790-3805, Sep. 2023.
19. G. Zhao, Z. Xiao, P. I. Mak, R. P. Martins, **M. K. Law**, "One-Cycle-Startup Relaxation Oscillator Using Ratiometric Threshold-Referenced and Self-Synchronized Power Gating Techniques," *IEEE Trans. Circuits Syst.-II, Exp. Briefs*, vol. 71, no. 1, pp. 56-60, Jan. 2024.
20. J. Zhao, R. Parvizi, R. Ghannam, **M. K. Law**, F. Walton, M. A. Imran, H. Heidari, "Self-Powered Implantable CMOS Photovoltaic Cell With 18.6% Efficiency," *IEEE Trans. Electron Devices*, vol. 70, no. 6, pp. 3149-3154, Jun. 2023.
21. C. Xu, L. Zhaog, **M. K. Law**, X. Zhao, P. I. Mak, R. P. Martins, "Modeling Attack Resistant Strong PUF Exploiting Stagewise Obfuscated Interconnections With Improved Reliability," *IEEE Internet Things J.*, vol. 10, no. 18, pp. 16300-16315, Sep. 2023.
22. C. Xu, J. Zhang, **M. K. Law**, X. Zhao, P. I. Mak, R. P. Martins, "Transfer-Path-Based Hardware-Reuse Strong PUF Achieving Modeling Attack Resilience With >200 Million Training CRPs," *IEEE Trans. Inf. Forensics Security*, vol. 18, pp. 2188-2203, Mar. 2023.
23. C. Xie, G. Zhao, Y. Ma, **M. K. Law**, M. Zhang, "Fully Integrated Frequency-Tuning Switched-Capacitor Rectifier for Piezoelectric Energy Harvesting," *IEEE J. Solid-State Circuits*, vol. 58, no. 8, pp. 2337-2348, Aug. 2023.
24. K. H. Wong, Z. Guo, **M. K. Law**, M. Chen, "Functionalized PAMAM constructed nanosystems for biomacromolecule delivery," *Biomater. Sci.*, 11, 1589-1606, 2023.

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26. H. Li, Q. Ma, Y. Jiang, **M. K. Law**, P. I. Mak, R. P. Martins, "Line-transient enhancement techniques for multi-path hybrid DC-DC converter with < 1% output overshoot/undershoot," *IET Electronics Letters*, vol. 58, no. 25, pp. 952-956, 2022.
27. B. Wang and **M. K. Law**, "Subranging BJT-based CMOS Temperature Sensor with a ± 0.45 °C Inaccuracy (3σ) from -50 to 180°C and a Resolution-FoM of $7.2\text{pJ}\cdot\text{K}^2$ at 150°C," *IEEE J. Solid-State Circuits*, vol. 57, no. 12, pp. 3693-3703, Dec. 2022. [Invited]
28. W. Zhong, F. Guo, F. Chen, **M. K. Law**, J. Lu, D. Shao, H. Yu, G. Chan, M. Chen, "A multifunctional oxidative stress nanoamplifier with ROS amplification and GSH exhaustion for enhanced chemodynamic therapy," *Frontiers in Pharmacology*, vol. 13, Nov. 2022. doi: 10.3389/fphar.2022.1044083
29. Y. Jiang, **M. K. Law**, P. I. Mak and R. P. Martins, "Arithmetic Progression Switched-Capacitor DC-DC Converter Topology With Soft VCR Transitions and Quasi-Symmetric Two-Phase Charge Delivery," *IEEE J. Solid-State circuits*, vol. 57, no. 10, pp. 2919-2933, May 2022. [invited]
30. Z. Zhang, C. Zhan, L. Wang, **M. K. Law**, "A -40~125°C 0.4 μ A Low Noise Bandgap Voltage Reference with 0.8mA Load Driving Capability Using Shared Feedback Resistors," *IEEE Trans. Circuits Syst.-II, Exp. Briefs*, vol. 69, no. 10, pp. 4033-4037, Jun. 2022.
31. J. Ma, Y. Chen, Y. Zhang, T. Song, X. Wang, **M. K. Law** and B. Long, "In-situ K-doped γ -LiV₂O₅ for a long-life anode and cathode for lithium ion battery," *ACS Appl. Energy Mater.*, 2022, DOI: 10.1021/acsaem.2c02289.
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33. K. Wang, W. Xu, C. Zhang, **M. K. Law**, L. Zhou, M. Chen and J. Chen, "A 240 μ W 17 bit ENOB $\Delta\Sigma$ Modulator Using 2nd-order Noise-Shaped Integrating Quantizer," *IEICE Electronics Exp.*, 19.20220038.
34. **M. K. Law**, Y. Jiang, P. I. Mak and R. P. Martins, "Miniaturized Energy Harvesting Systems Using Switched-Capacitor DC-DC Converters," *IEEE Trans. on Circuits Syst. II, Exp. Briefs*, vol. 69, no. 6, pp. 2629-2634, Jun. 2022.
35. M. Li, L. Wan, **M. K. Law**, L. Meng, Y. Jia, P. I. Mak and R. P. Martins, "One-shot high-resolution melting curve analysis for KRAS point-mutation discrimination on a digital microfluidics platform," *Lab Chip*, 2022, DOI: 10.1039/D1LC00564B.
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