

# Ph.D. Melik Yazıcı

ELECTRONICS ENGINEER · ANALOG IC DESIGNER

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## Research Interests

MM-WAVE CIRCUITS, MEASUREMENT TECHNOLOGIES, 5G AND BEYOND COMMUNICATION CIRCUITS, VLSI, ANALOG DIGITAL AND MIXED-MODE INTEGRATED CIRCUITS, SENSOR INTERFACE CIRCUITS, READOUT INTEGRATED CIRCUITS FOR INFRARED DETECTORS AND ADCS

## Education

### Sabancı University

Istanbul, TURKEY

PH.D. IN ELECTRONICS ENGINEERING

2010 - 2016

- GPA: 3.91/4.00
- Academic Advisor: Prof. Yasar Gurbuz
- Thesis: High Dynamic Range Pixel Architecture with Smart Light Intensity Decision Unit

### Sabancı University

Istanbul, TURKEY

M.SC. IN ELECTRONICS ENGINEERING

2008 - 2010

- GPA: 3.71/4.00
- Academic Advisor: Prof. Yasar Gurbuz
- Thesis: Realization of Low Power, Highly Linear ROIC with Current Mode TDI for LWIR Detectors

### Sabancı University

Istanbul, TURKEY

B.S. IN ELECTRONICS ENGINEERING

2003 - 2008

- GPA: 3.39/4.00
- Project Advisors: Prof. Ibrahim Tekin, Prof. Yasar Gurbuz
- Project: Hardware/Software Design and Implementation of GPRS/GPS Enabled Air Pollution Sensor Network

## Academic Experience

### Sabancı University

Istanbul, TURKEY

POSTDOCTORAL RESEARCHER

Sept. 2016 - Present

- Supervising, coordinating and contributing following projects:
- **Principal Investigator:** Adaptive Self-Interference Cancellation Based Full Duplex RF Front-End for 5G Phased Arrays operating at 28 GHz (TÜBİTAK 1001) 2018-2020
- **Researcher** Development of High-Performance Substrate for RF and mmWave Packaging Applications: Project coordination and mm-Wave electrical measurements (dielectric constant, loss and etc)(ASELSAN). 2019-2021
- **Researcher** High Speed Low Latency Integrated Circuit Design for Blockchain Infrastructure (SUPRANATIONAL) 2019-2020
- **Principal Investigator - Submitted** mm-Wave Frequency Extender Module on Silicon (TÜBİTAK 1001 - submitted)
- D-Band SiGe Passive mm-Wave Imaging Receiver with MEMS Switch (TUBİTAK 1003): **Coordinating and designing base band electronics**
- W-Band SiGe Passive Millimeter-Wave Radiometer (TUBİTAK 1001): **Coordinating and designing base band electronics**
- X-Band SiGe BiCMOS T/R Module for Phased Array Systems (Industry Funded): **Advising for digital control blocks**
- THz rectenna heat harvesting (Lockheed Martin): **Designing readout and energy harvesting electronics**
- Developing SiGe Multi Quantum Well Bolometer and ROIC (TUBİTAK 1003): **Advising and system level design**
- Supervising undergraduate students for spring and summer projects: Rectenna and Energy Harvesting, Infrared Camera Module Design and THz Passive Imaging (Sabancı University PURE Program 2018-2019 Summer)

### Sabancı University

Istanbul, TURKEY

RESEARCH & TEACHING ASSISTANT (PHD)

Sept. 2010 - Sept. 2016

- Worked as a research and teaching assistant. Job includes attending Analog IC Design (EE 303) and Electronic Circuits II (EE 202) as Teaching Assistant. Also, supervised freshmen students for their projects (PROJ102).
- As a research assistant, worked on IC design projects on several tape-outs with 0.35  $\mu\text{m}$ , 0.18  $\mu\text{m}$ , 90 nm and 65 nm technologies, designed various analog sub-blocks that operate at 77K; operational amplifiers, buffers, sample and hold stages, ADCs, DUT set-ups and test cards:
- Design and Implementation of High Dynamic Range ROIC Utilizing Automatic Input Preamplifier Selection (SAN-TEZ): **full responsibility**
- Design of a 8 bit Single Slope ADC Using 65nm TSMC Technology for Neural Networks (Human Brain Project-EU): **full responsibility**
- 640x512 ROIC with Low Quantization Noise High Charge Handling Capacity for LWIR Detectors (SAN-TEZ): **contribution and measurement**
- Design and Implementation of Digital TDI ROIC (SAN-TEZ): **partial contribution**
- Design and Implementation of High Speed Low Power DROICs (TUBİTAK 1001): **proposal, partial contribution and measurement**
- Developing SiGe Multi Quantum Well Bolometer and ROIC (TUBİTAK 1003): **partial contribution**
- Development of Hand-Held Diagnostic Device for Detection of Cancer and Cardiovascular Disease Risk Markers (TUBİTAK 1003): **design of readout electronics for handheld unit**

- Worked as a research and teaching assistant. Job includes attending Analog IC Design (**EE 303**) and Electronic Circuits II (**EE 202**) classes as Teaching Assistant. Also, supervised freshmen students for their projects (**PROJ102**).
- As research assistant, worked on IC design projects on several tape-outs with 0.35  $\mu\text{m}$  and 0.18  $\mu\text{m}$  technologies, designed ROIC architecture, various analog sub-blocks that operate at 77K, and design of test set-up & test cards:
- Realization of Low Power, Highly Linear ROIC with Current Mode TDI for LWIR Detectors: fully responsible
- Design and Implementation of 28x4 Analog TDI ROIC (**Industry Funded**): **contribution and measurement**
- Design and Implementation of 576x7 Analog TDI ROIC (**Industry Funded**): **contribution and measurement**

## Publications

### Patents

- Omer Ceylan, **Melik Yazici**, Kolkar H. Javed and Yasar Gürbuz, "Hand-Held Point-of-Care Device for Detection of Multiple Cancer and Cardiac Disease Biomarkers" Patent Applied, Decision Pending, 2017.
- **Melik Yazici**, Omer Ceylan, Hüseyin Kayahan and Yasar Gürbuz, "Large format short wave infrared (SWIR) focal plane array (FPA) with low noise and high dynamic range" U.S. Patent, US9324745, 2016.
- Omer Ceylan, **Melik Yazici**, Hüseyin Kayahan and Yasar Gürbuz, "Pixel level digital implementation of time delay integration algorithm for low noise, high dynamic range and low power readout integrated circuits", U.S. Patent, WO2014082660, Jun, 5, 2014.

### Journals

- E.Turkmen, B. Cetindogan, M. Yazici, M. Kaynak and Y. Gurbuz, "Design and Characterization of a D-Band SiGe HBT Front-end for Dicke Radiometers", *IEEE Transactions on Industrial Electronics* 2019 (**In progress**)
- C. Çalışkan, A. Burak, E. Turkmen, B. Cetindogan, M. Davulcu, **M. Yazici**, N. Oznazli, and Y. Gurbuz, "Positively Sloped 6-Bit SiGe BiCMOS T/R Module Core-Chip for X-Band Application" *IEEE Transactions on Circuits and Systems I: Regular Papers*. 2019 (**Under Revision**).
- C. Çalışkan, **M. Yazici**, M. Kaynak and Y. Gurbuz, "A Switchless SiGe BiCMOS Bidirectional Amplifier for Wideband Radar Applications," *IEEE Transactions on Circuits and Systems II: Express Briefs*, 2019 (**Under Revision**).
- C. Çalışkan, I. Kalyoncu, **M. Yazici**, and Y. Gurbuz, "Sub-1-dB and Wideband SiGe BiCMOS Low-Noise Amplifiers for X-Band Applications," *IEEE Transactions on Circuits and Systems I: Regular Papers*, ol. 66, no. 4, pp. 1419-1430, April 2019.
- C. Çalışkan, I. Kalyoncu, **M. Yazici**, M. Kaynak and Y. Gurbuz, "Ultra-Low Noise Amplifier for X-Band SiGe BiCMOS Phased Array Applications," in *IEEE Transactions on Circuits and Systems II: Express Briefs*. January 2019. (**Early Access**)
- C. Çalışkan, A. Burak, E. Turkmen, **M. Yazici** and Y. Gurbuz, "Active Positive Sloped Equalizer for X-Band SiGe BiCMOS Phased Array Applications," in *IEEE Transactions on Circuits and Systems II: Express Briefs*. January 2019. (**Early Access**)
- O. Ceylan, G. Mishra, **M. Yazici**, Y. Gurbuz, "Development of Hand-Held Point-of-Care Diagnostic Device for Detection of Multiple Cancer and Cardiovascular Disease Biomarkers", *IEEE Transaction on Biomedical Circuits and Systems*, 2018.
- S. Abbasi, A. Shafique, O. Ceylan, M. Yazici, Y. Gurbuz, "A Partially Pixel-Parallel DROIC for MWIR Imagers With Columnwise Residue Quantization", *IEEE Transactions on Electron Devices*, 2018.
- Shahbaz Abbasi, Galioglu Arman, Omer Ceylan, **Melik Yazici**, and Yasar Gurbuz "A PFM-Based Digital Pixel With an Off-Pixel Residue Measurement for Small Pitch FPAs," *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 64, no. 8, pp. 887-891, Aug. 2017.
- **Melik Yazici**, Omer Ceylan, Atia Shafique, Shahbaz Abbasi, Arman Galioglu, Yasar Gurbuz, "A new high dynamic range ROIC with smart light intensity control unit", *Infrared Physics and Technology*, Volume 82, May 2017, Pages 161-169, ISSN 1350-4495.
- S. Abbasi, A. Galioglu, O. Ceylan, **M. Yazici**, and Y. Gurbuz, "A PFM Based Digital Pixel with Off-Pixel Residue Measurement for Small Pitch FPAs," *IEEE Transactions on Circuits and Systems II: Express Briefs*, 2016.
- Atia Shafique, Huseyin Kayahan, Sohaib Saadat Afridi, Omer Ceylan, **Melik Yazici**, Shahbaz Abbasi, Arman Galioglu, Yasar Gurbuz, "Dynamic power reduction in digital pixel design for large format focal plane arrays", *Microelectronics Journal*, Volume 58, December 2016.
- O. Ceylan, A. Shafique, A. Burak, C. Caliskan, **M. Yazici**, S. Abbasi, A. Galioglu, H. Kayahan, and Y. Gurbuz, "Digital Readout Integrated Circuit (DROIC) Implementing Time Delay and Integration (TDI) for Scanning Type Infrared Focal Plane Arrays (IRFPAs)," *Infrared Physics and Technology*, 2016.
- H. Kayahan, **M. Yazici**, O. Ceylan, and Y. Gurbuz, "A new digital readout integrated circuit (DROIC) with pixel parallel A/D conversion and reduced quantization noise," *Infrared Physics and Technology*, 2014 (Vol. 63, pages 125-132).
- H. Kayahan, O. Ceylan, **M. Yazici**, S. Zehir, and Y. Gurbuz, "Wide range, process and temperature compensated voltage controlled current source," *IEEE Transactions on Circuits and Systems-I: Regular Papers*, 2013 (Vol. 60, No. 5).

### Proceedings (Selected)

- **M. Yazici**, O. Ceylan, A. Shafique, S. Abbasi, A. Galioglu, and Y. Gurbuz, "High Dynamic Range Smart Pixel Architecture for Infrared Focal Plane Arrays," *ISCAS*, 2018.
- H. Kandis, **M. Yazici**, Y. Gurbuz and M. Kaynak, "A Wideband (3–13 GHz) 7-Bit SiGe BiCMOS Step Attenuator with Improved Flatness," *2018 18th Mediterranean Microwave Symposium (MMS)*, Istanbul, 2018, pp. 139-142.
- Atia Shafique, Emre C. Durmaz, Barbaros Cetindogan, **Melik Yazici**, Mehmet Kaynak, Canan B. Kaynak, and Yasar Gurbuz, "Design of monocrytalline Si/SiGe multi-quantum well microbolometer detector for infrared imaging systems", *Proc. SPIE 9819, Infrared Technology and Applications XLII*, 2016.
- **Melik Yazici**, Huseyin Kayahan, Omer Ceylan, Atia Shafique, Yasar Gurbuz, "Low-power LVDS for digital readout circuits", *Proc. SPIE 9451, Infrared Technology and Applications XLI*, 94510Y, 2015.
- Atia Shafique, **Melik Yazici**, Huseyin Kayahan, Omer Ceylan, Yasar Gurbuz, "Digital pixel readout integrated circuit architectures for LWIR", *Proc. SPIE 9451, Infrared Technology and Applications XLI*, 94510V, 2015.
- Huseyin Kayahan, Ömer Ceylan, **Melik Yazici**, Yasar Gurbuz, "A new digital readout integrated circuit (DROIC) with pixel parallel A/D conversion with reduced quantization noise", *Proc. SPIE 9070, Infrared Technology and Applications XL*, 2014.

- **Melik Yazici**, Huseyin Kayahan, Omer Ceylan, Sohaib Saadat Afridi, Atia Shafique, Yasar Gurbuz, "Implementation of high-dynamic range pixel architecture for SWIR applications", Proc. SPIE 9070, Infrared Technology and Applications XL, 2014.
- Omer Ceylan, Huseyin Kayahan, **Melik Yazici**, Yasar Gurbuz, "Design of 90x8 ROIC with pixel level digital TDI implementation for scanning type LWIR FPAs", Proc. SPIE 8704, Infrared Technology and Applications XXXIX, 2013.
- **Melik Yazici**, Huseyin Kayahan, Omer Ceylan, Yasar Gurbuz, "A new unit cell design with automatic input stage selection capability for increased SNR", Proc. SPIE 8704, Infrared Technology and Applications XXXIX, 2013.
- **Melik Yazici**, Huseyin Kayahan, Omer Ceylan, Yasar Gurbuz, Design of a ROIC for scanning type HgCdTe LWIR focal plane arrays. Proc. SPIE 7660, Infrared Technology and Applications XXXVI, 2010.

## Honors & Awards

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### DOMESTIC

- 2010 - 2015 **Graduate Scholarship**, from The Scientific and Technological Research Council of Turkey (TÜBİTAK, based on nationwide exam and master grades).
- 2012 - 2014 **Entrepreneurship and Startup Fund**, from Ministry of Science, Industry and Technology, being 6<sup>th</sup> among 1600 total funded projects and 1<sup>st</sup> in its field.
- June 2003 **First Degree**, Graduation from Bartın Anatolian High School.

### SABANCI UNIVERSITY

- 2010 **Full Graduate Scholarship**, Electronics Engineering Ph.D. Program.
- 2008 - 2010 **Full Graduate Scholarship**, Electronics Engineering Master Program.
- 2004 - 2008 **Certificates of High Honor and Honor**, Electronics Engineering Program.
- 2003 **Ranked First in Poster Contest**, University wide poster contest organized by Civil Involvement Projects to increase awareness of social responsibility.
- 2003 - 2008 **Merit Scholarship**, Awarded for ranking in the first 4000 among 1.7 million people in the Nationwide University Entrance Exam.

## Services and Activities

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### ARAMA KONFERANSI (aramakonferansi.com)

*Istanbul, Turkey*

#### CONSULTANCY

*2019*

- Designing EE Curriculum of Abdullah Gul University According to Capsule Education Method.

### Sabancı University Microelectronics Workshop (sumicro.sabancıuniv.edu)

*Istanbul, TURKEY*

#### ORGANIZER

*Jul. 2014 - 2016*

- Description: **Sabancı University Microelectronics Workshop** focuses on microelectronics, from technology to circuits and systems perspective, and its applications on sensing and processing electronic systems for space applications. All lectures are presented by invited speakers around the world. It is organized since 2014
- Responsible of organization of the program, coordination of invited speakers, public relations, and logistics support. Also, organizes the published and the online content.

### Civic Involvement Project (cip.sabancıuniv.edu)

*Istanbul, Turkey*

#### PARTICIPANT

*2004 - 2005*

- Tutoring the elementary/middle school students after school time and preparing educational and creative content and games.

## Skills

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<b>CAD Tools</b>	ADS, Cadence Virtuoso, LTSpice, PSpice.
<b>Process Technologies</b>	Substantial tapeout experience in following CMOS technologies: AMS 0.35 $\mu\text{m}$ , XFAB 0.18 $\mu\text{m}$ , TSMC 90 and 65 nm.
<b>Measurement Skills</b>	Analog, digital and mixed-mode chip measurements using custom designed test cards.
<b>Cleanroom Experience</b>	Class 1000: alignment, deposition, photolithography and wet etching
<b>Programming</b>	C/C++, LaTeX, MATLAB, Python, Verilog.
<b>Computer Skills</b>	Linux, Mac OS, MS Office, Origin Pro, Photoshop, Windows.
<b>Languages</b>	Turkish (Native), English (advanced academic).

## Interests and Activities

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### Non-exhaustive and in alphabetical order

- Art (contemporary and Renaissance), cinema (history, independent), fitness & nutrition, hobby electronics (Raspberry Pi), amateur photography, technology (electronics trends, IoT, semiconductor industry and imaging sensors) and travel.