

Sedat Pala

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EDUCATION

University of California Berkeley, CA, US

Ph.D. in Mechanical Engineering

Aug. 2017–May 2022 (Expected)

- Major: MEMS/Nano, Minors: Electrical Engineering & Design, GPA: 3.71/4.00
- Member of Berkeley Sensor and Actuator Center (BSAC) and Lin Lab

Middle East Technical University (METU), Ankara, Turkey

M.Sc. in Mechanical Engineering

Jan. 2015 – June 2017

- Major: MEMS/Nano, GPA: 3.79/4.00
- Ranked “Most successful student in M.Sc. Program”, High Honor Roll

B.Sc. in Mechanical Engineering

Sept. 2009 - Jan. 2015

- Ranked 1st out of 319 students, High Honor Roll, GPA: 3.85/4.00

Minor in Business Administration

Sept. 2011 - Jan. 2015

RELEVANT EXPERIENCE

UC Berkeley, CA, US - Graduate Student Researcher

Aug. 2017 – Present

- Designed, fabricated, and characterized high performance piezoelectric ultrasonic micromachined transducers (pMUTs)
- Published papers in journal and international conference about novel pMUT design and applications

Apple Inc., CA, US – Hardware Technology Intern

May 2021 – Aug. 2021

- Worked as a Product Design (PD) engineer in Haptics Team.
- Designed and simulated acoustic components for next generation, unreleased Apple devices.

Facebook Inc., WA, US - Hardware Research Intern

June 2020 – Aug. 2020

- Designed pMUT arrays for low SWaP+C eye tracking subsystem for new generation AR glasses.

UC Berkeley, CA, US - Graduate Student Instructor

Jan. 2020 – May 2020

- Assisted in upper division and graduate level class

METU, Ankara, Turkey -Teaching and Research Assistant (TA & RA)

Sept. 2014 – Aug. 2017

- Executive Teaching Assistant: Managed department course schedule and responsibilities of 50 TAs
- Assisted courses in undergraduate and graduate level

Aselsan Inc., Ankara, Turkey - Test Engineering Intern

July 2014 – Aug. 2014

- Mechanical testing of turret lock mechanism and portable crane for turret gun.

Turkish Aerospace Industries (TAI) Inc., Ankara, Turkey - Hardware Engineering Intern

May 2013 – Aug. 2013

- Assisted in design and tests of first national satellite components

RESEARCH AND PROJECTS

Projects

Ultrasound-induced Haptic Interface, BSAC, CA, US

Jan. 2020 – Present

Development of high intensity, low power, and small footprint haptic interface using ultrasound generated by pMUT array for AR/VR applications.

Highly Responsive pMUTs, BSAC, CA, US

Jan. 2018 – Present

Development of novel pMUTs architectures with higher electromechanical coupling, bandwidth, and acoustic pressure output.

Optically Transparent pMUTs, BSAC, CA, US

Oct. 2018 – Jan. 2021

Development of optically transparent pMUTs with high output pressure and bandwidth for display application

Temperature detection using micro plate vibrations, METU – MEMS Center, Ankara, Turkey

Jan. 2015 – June 2017

A single crystal Si μ -plate resonator is designed, modeled, fabricated and tested to be used as a temperature sensor.

Patents

S. Pala, J. Harrison, M. Shin, *Peripheral Device With Acoustic Resonator*, filed on November 19, 2021. App. No: 63/264,351

S. Pala, D. Senkal, *Phased Array Of Ultrasound Transducers For Depth Sensing*, filed on March 9, 2021. App. No: 17/196,130

L. Lin, Y. Peng, **S. Pala**, Z. Shao, *Subcutaneous and Continuous Blood Pressure Monitoring by pMUTs*, filed on September 3, 2021. App. No: 63/240,843

Publications

S. Pala, Z. Shao, Yande Peng, and L. Lin, "Attenuation of Curved Structural Surfaces in pMUT Measurements," in 2021 34th International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers), 2021

Z. Shao, **S. Pala**, Y. Peng, and L. Lin, "Bimorph Pinned Piezoelectric Micromachined Ultrasonic Transducers for Space Imaging Applications," *Journal of Microelectromechanical Systems*, vol. 30, no. 4, pp. 650-658, 2021

S. Pala, Z. Shao, Y. Peng, and L. Lin, "Ultrasound-Induced Haptic Sensations Via PMUTS," pp. 911-914, 2021.

S. Pala, Z. Shao, Y. Peng, and L. Lin, "Improved Ring-Down Time and Axial Resolution of pMUTs via a Phase-Shift Excitation Scheme," pp. 390-393, 2021

Z. Shao, **S. Pala**, Y. Liang, Y. Peng, and L. Lin, "A Single Chip Directional Loudspeaker Based on PMUTS," pp. 895-898, 2021

Z. Shao, Y. Peng, **S. Pala**, Y. Liang, and L. Lin, "3D Ultrasonic Object Detections with >1 Meter Range," pp. 386-389, 2021

S. Pala and L. Lin, "Piezoelectric Micromachined Ultrasonic Transducers (pMUT) with Free Boundary," pp. 1-4, 2020

- S. Pala, Y. Liang, B. E. Eovino, Z. Shao, and L. Lin, "Radius of curvature measurement using piezoelectric micromachined ultrasonic transducers," pp. 865-868, 2020
- Z. Shao, S. Pala, Y. Liang, T. Jiang, and L. Lin, "Non-contact surface temperature sensing based on a single bimorph PMUTs array," pp. 861-864
- S. Pala and L. Lin, " Fully transparent piezoelectric ultrasonic transducer with 3D printed substrate," in 2019 33rd International Conference on Solid-State Sensors, Actuators and Microsystems (Transducers), 2019
- S. Pala, K. Azgin, "Thermal sensitivity of the fundamental natural frequency of a resonant MEMS IR detector pixel", Proc. SPIE 10404, 2017, Infrared Sensors, Devices, and Applications VII, 104040V
- S. Pala, "Temperature detection using micro plate vibrations," (M.Sc. thesis), Mechanical Eng., Middle East Technical University, Ankara, 2017
- S. Pala, and K. Azgin, "A MEMS square Chladni plate resonator," Journal of Micromech. and Microeng., 26, pp. 105016 (2016).
- S. Pala, M. Çiçek, and K. Azgin, "A Lorentz force MEMS magnetometer," in 2016 IEEE SENSORS, 2016, pp. 1-3.

ADDITIONAL

Service to Profession

Reviewer

2020 - Present

- IEEE Sensor Journal
- Journal of Microelectromechanical Systems (JMEMS)
- Electron Device Letters (EDL)

IEEE MEMS Conference 2020 Technical Program Committee – Student Member

Oct. 2019

Skills

Microfabrication in Clean Room

- Berkeley Marvell Nanofabrication Laboratory, Fabrication of highly responsive pMUTS
- METU MEMS Center, SOI based fabrication of single crystal Si micro resonators

Jan. 2018 – Present
Aug. 2015 – Aug. 2017

Language

Turkish (Native), English (Proficient)

Awards

NSF Award, \$400k: Multi-modal Haptic Stimulations Using Micromachined Ultrasound Processors,
Award No: 2128311

Sep. 2021 – Sep.2024

Best Paper Award, BSAC

2019, Fall

Graduate Student Researcher Grant, \$330k: UC Berkeley, Georgia Ins. of Technology, UC Irvine

April,2017

Graduate Courses Performance Award, METU

2015, Spring

National Scholarship Program for M.Sc. Student, \$30k, The Scientific and Technological Research
Council of Turkey

Mar. 2015 – June 2017

Travel Grants, \$500: TRF and SPIE

Jan.2020 and Aug. 2017

Interests

Volunteer - ILKYAR (Education Funds for Elementary Schools)

Jan. 2012 - Present

- Designed and performed science experiments (physics, computer science, robotic) to elementary school students
- Warehouse Management Chair
- Member of Administrative Board and Management Team

Ballroom Dancing

Sept. 2019 - Present

• Competed at 20th Berkeley Classic Competition: 1st place Jive, 2nd place Rumba ,4th place Waltz

March 2020

• Competed at 20th Berkeley Beginners Competition: 3rd place Jive, 4th place Waltz

Nov. 2019

Soccer

For over 20 years

• Awarded "The Most Gentlemen Player Cup"

2004

• Wined the school championships

2004