

MUSTAFA GHANIM

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EDUCATION

PhD in Electrical and Computer Eng. (GPA: 4.00/4.00) - University of Arizona, Tucson AZ, USA - *August 2022-Present*

MSc in Electrical and Electronics Eng. (GPA: 4.00/4.00) - Ozyegin University, Istanbul, Turkiye - *September 2019-December 2021*

BSc in Electronics and Communication Eng. (GPA: 3.71/4.00) - Istanbul Technical University, Istanbul, Turkiye - *August 2015 - July 2019*

WORK EXPERIENCE

Graduate Research and Teaching Assistant - University of Arizona, Tucson AZ, USA - *August 2022 - Present*

- Research assistant at Reconfigurable Computing Lab:
 - Deployed carrier frequency offset estimation and time dilation apps on heterogeneous SoCs utilizing runtime environment APIs.
 - Proposed and implemented a real-time framework for capturing essential features on homogenous and heterogenous computing systems from application to microarchitecture level.
 - Implemented a low-area, low-power, and fast deep autoencoder model to detect system-wide abnormal behaviors on MPSoC ZCU102 FPGA.
 - Supported developing an optimized version of a runtime manager for DSSoCs with a minimal context switching overhead.
- Teaching assistant of Fundamentals of Computer Organization and Electronic Circuits courses.

Graduate Digital Design Intern - Texas Instruments, Tucson AZ, USA - *May 2024 - August 2024*

- Assisted in determining test methodologies for space-grade DAC devices, targeting new technology nodes.
- Designed an immune memory element to Single Event Effects using scrubbing, Hamming encoding/decoding, and majority voting.

Graduate Research and Teaching Assistant - Ozyegin University, Istanbul, Turkiye - *September 2019 - August 2022*

- Research assistant at nEMESysLab (Embedded Systems/Microelectronic Lab):
 - Disparity (depth) map estimation in MATLAB using local block matching algorithm.
 - Developed a novel, lossless, and low-cost disparity compression algorithm with two variants based on spatial correlations
 - Implemented an area-efficient 3x3 median filter and the proposed disparity compression algorithms on both CPU using MATLAB and on FPGA using Verilog-RTL.
 - Performed accurate dynamic power analysis based on switching activities.
- Teaching assistant of Mechanical Physics and Digital Systems courses.

Research and Development Intern - AntSis Electronics, Gebze, Turkiye - *June 2019 - August 2019*

- Video processing with Microblaze using Vivado Block Design and SDK.
- Integrated an FMC chip on UltraScale MPSoC to generate different color patterns for testing UHD display quality.

Research and Development Intern - Arcelik Cooking Appliances, Bolu, Turkiye - *July 2018 - August 2018*

- Conducted electrical safety tests to ensure compliance with international standards for induction hobs.
- Helped in simulating soft switching techniques for power circuits to enhance their energy efficiency.

Research and Development Intern - ITU Embedded Systems Lab, Istanbul, Turkiye - *June 2017 - July 2017*

- Developed face recognition system on Intel Galileo.
- Tested communication protocols between different embedded systems.

TECHNICAL SKILLS

Programming Languages:

- C, C++, C#, CUDA, Python, Verilog/SystemVerilog, Verilog-A, MATLAB, Assembly, BASH

Software and Tools:

- LaTeX, Excel Solver, Simulink, HDL Coder, ISE/Vivado/ModelSim, PetaLinux, Linux, HFSS, LTspice, Synopsys/Cadence, Wireshark, Git, Slurm

LANGUAGES

- Arabic: Native • English: Proficient • Turkish: Fluent

COLLABORATIVE RESEARCH PROJECTS

- DARPA-PROWESS : Dynamic Runtime Domain-Focused Software-Reconfigurable Heterogeneous (DR-DASH) Processor Grant # HR001123C0130
- DARPA-DSSoC: Domain-Focused Advanced Software-Reconfigurable Heterogeneous System on Chip (DASH-SoC) Grant #FA8650-18-2-7860
- DARPA-SPACEBACN: Configurable Optical Communications via Heterogeneous-Processing Optimized Node (COCHON) Grant #HR00112290043

ACADEMIC ACHIEVEMENTS

Awards & Rankings:

- Received the Best Demonstration Award at the ECE Graduate Student Research Poster & Demo Symposium, University of Arizona, 2024
- Recognized as the top Palestinian bachelor's student in academic performance in Turkiye, 2017.
- Joined the Faculty High Honor List after completing my bachelor's degree at Istanbul Technical University, Turkiye, 2019.

Publications:

- [1] **Ghanim, M.**, Tasdizen, O., Ugurdag, H. F., & Hamzaoglu, I. (2023). An efficient algorithm for disparity map compression based on spatial correlations and its low-cost hardware architecture. *Integration*, 102069.

[2] **Ghanim, M.**, Hüner, Y., Gayretli, M. G., Öney, M. M. (2019). Design and Implementation of FPGA Based Quadrotor Controller [Senior design project, Istanbul Technical University]. doi: <http://dx.doi.org/10.13140/RG.2.2.29095.47523>.

[3] Akçay, L., Göncü, E., Esen, M. M., Uslu, S., **Ghanim, M.**, Yolcu, N. B., ... & Yalçın, B. Ö. (2019). Design and implementation of RISC processor with different CMOS technologies. *ITU Processor Design Workshop, Istanbul, Turkiye*. doi: <http://dx.doi.org/10.13140/RG.2.2.34502.83524>.

Service:

- Peer-reviewer at *Digital Signal Processing: A Review Journal*.