

Ismet Dagli

Computer Science Department
Colorado School of Mines

Phone: +1 951 446 67 24
Mail: ismetdagli@mines.edu
Address: Golden, CO

Research Interest

Heterogeneous architectures, autonomous vehicles, system programming, domain-specific architectures, parallel programming paradigms on AI and robotics, energy-performance trade-off, deep learning, high-level synthesis, runtime systems, compiler optimization,

Work Experience

Colorado School of Mines

Jan 2020 – Present

Research Assistant

Golden, CO

- Advisor: Mehmet E. Belviranlı
- I modeled energy/performance trade-offs on heterogeneous accelerators. I applied mapping techniques for heterogeneous DNN workloads into heterogeneous accelerators in order to maximize the utilization of SoC. The models are evaluated on NVIDIA Orin/Xavier and Snapdragon 865 platforms.

Pacific Northwest National Laboratory

May 2021 – Dec 2021

Ph.D. Intern

Richland, WA

- Supervisor: Antonino Tumeo
- Adapted some evolutionary algorithms on high-level synthesis
- Applied MLIR optimizations on high-level synthesis

Colorado School of Mines

August 2020 – May 2021

Teaching Assistant

Golden, CO

- Taught as a TA in a senior class of more than 300 students for two semesters, CSCI442: Operating System

Tubitak Research Center

August 2019 – Dec 2019

Part-Time Artificial Intelligence Engineer

Istanbul, Turkey

- Supervisor: Ali Rıza Ekti
- Worked on recognizing the class of voices in a domestic environment on STM32

Baykar Tactical UAS

Jul 2018 – Sept 2018

Software Engineer Intern

Istanbul, Turkey

- Supervisor: Tolga Büyükyazı
- Developed a CNN semantic segmentation model on Jetson TX2 for sky objects
- Implemented detection algorithm for small objects with a dynamic camera written in C++

BGA Security

June 2017 – August 2017

Security of IoT devices Intern

Istanbul, Turkey

- Exploring the vulnerability testing on wearable IoT devices

Education

Colorado School of Mines

- *Doctor of Philosophy in Computer Science*
GPA: 3.84

Jan 2020 - Present
Golden, CO
(Exp. Graduate in 2025)

Boğaziçi University

- *Bachelor of Science in Computer Science and Engineering*

Sept 2015 - Dec 2019
Istanbul, Turkey

Publications

- Ismet Dagli, Andrew Depke, Andrew Mueller, Sahil Hassan, Ali Akoglu, Mehmet Belviranli, “Contention-aware Performance Modeling for Heterogeneous Edge and Cloud Systems”, 3rd workshop on Flexible Resource and Application Management on the Edge(FRAME), 2023
- **Ismet Dagli**, Alexander Cieslewicz, Jedidiah McClurg, Mehmet E. Belviranli, “AxoNN: Energy-Aware Execution of Neural Network Inference on Multi-Accelerator Heterogeneous SoCs”, 59th ACM/IEEE **Design Automation Conference(DAC)**, 2022
- Justin McGowen, **Ismet Dagli**, Mehmet Belviranli, Neil Dantam; “Representations for Scheduling of Heterogeneous Computation to Support Motion Planning”; Implicit Representations for Robotic Manipulation RSS 2022 Workshop
- Antonino Tumeo, Marco Minutoli, Vito Giovanni Castellana, Limaye Ankur, Tan Cheng, **Ismet Dagli**, Nicolas Bohm Agostini, Serena Curzel, Amatya Vinay, Manzano Joseph; “Accelerating Data Processing at the Edge with Extreme Specialization”; 2022 ASCR Workshop on the Management and Storage of Scientific Data, 2022
- **Ismet Dagli**, Mehmet E. Belviranli, “Automated generation of integrated digital and spiking neuromorphic machine learning accelerators”; 2021 IEEE/ACM Redefining Scalability for Diversely Heterogeneous Architectures Workshop (RSDHA), 2021
- Serena Curzel, Nicolas Bohm Agostini, Shihao Song, **Ismet Dagli**, Ankur Limaye, Cheng Tan, Marco Minutoli, Vito Giovanni Castellana, Vinay Amatya, Joseph Manzano, Anup Das, Fabrizio Ferrandi, Antonino Tumeo; “Automated generation of integrated digital and spiking neuromorphic machine learning accelerators” 2021 IEEE/ACM **International Conference On Computer Aided Design (ICCAD)**, 2021

Posters

- **Ismet Dagli**, Mehmet E Belviranli, “Layer-wise Concurrent DNN Execution Characterization and Scheduling for Heterogeneous System-on-Chips”, C-MaPP 2023
- **Ismet Dagli**, Soner Seckiner, Jake Hertz, Bo Wu, Selcuk Kose and Mehmet Belviranli, “Extracting Neural Network Models via Contention-based Side Channel Attacks On Shared Memory System-on-Chips, C-MaPP 2023
- **Ismet Dagli**, Mehmet E. Belviranli, “HaX-CoNN: Heterogeneity-aware Execution of Concurrent Deep Neural Networks”, MICRO SRC 2022
- **Ismet Dagli**, Mehmet E Belviranli, “Multiple Neural Network Inference on Heterogeneous SoCs”, GRADS 2022
- **Ismet Dagli**, Mehmet E Belviranli, “Energy-Aware Execution of Neural Network Inference on Multi-Accelerator Heterogeneous SoCs”, C-MAPP 2022
- **Ismet Dagli**, Levent Akin, “Increasing the Localization Performance via Semantic Segmentation” CMPE BOUN, Poster Presentation, 2019

Awards

- 59th MICRO ACM Student Research Competition (SRC) 2022, 2nd Runner up, \$200
- ScienceSlam@SC21, Full registration for SC21 conference, accommodation, stipend, up to ~4k \$.
- GSG Mines, Travel grant, 900\$, 2021.
- Monthly stipend awarded during bachelor of education by Turkish government, ~10k \$, Turkey, 2015-2019.

Personal Projects

Gumus R&G Autonomous Car Team

Aug 2020 - Current

- Role: Software Team lead

I am the team with 16 engineers for the Robotaxi-Full Scale Autonomous Vehicle Competition. I lead the software team for any task, such as object detection and recognition, path planning, simulation.

Kozalak Drone

Mar 2018 - Sept 2018

- Related Skills: Autonomous drone framework on Jetson TX2

I was a part of a team with 7 engineers for a UAV competition. I conduct the whole part by myself by running various object detection models to pick the best results and integrating them with an autonomous drone framework Jetson TX2.

The Grateful 8

Feb 2018 - July 2018

- Related Skills: Planning the software project and using python libraries

The project is about providing an environment for clients and freelancers to collaborate on a single platform. I was in a part that made long-term planning and used some Python libraries for the back-end.

DIY Drones

Nov 2017 - Feb 2018

- Related Skills: Building drone like F450

I changed the package of f450 according to my desires and built the drone from scratch. The detailed mechanical and electronic progress is completed.

Prusa i3

Oct 2017 - May 2018

- Related Skills: Building printer and making calibration

I and 2 mechanical engineering students built a 3D printer and I was responsible for both building electronic components and calibration for components.

Skills

- **Programming Skills:** C++, Python, C, Java, ROS, Verilog,
- **Tools & Technologies:** TensorRT, Linux, TensorRT, Jetson platforms, CUDA, OpenMP, Z3 Solver, Keras, Tensorflow, Caffe, OpenCV
- **Interests:** F1, Tennis, Archery
- **External Reviewer:** DAC'2022, DAC'2023, ICS'2022, ICS'2023, ISC-HPC'2023, HIPS'2022, IEEE Access, IEEE TPDS, Parallel Computing (PARCO) Journal,