

Ismet Dagli

Computer Science Department
Colorado School of Mines

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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 to maximize the utilization of SoC. The models are evaluated on NVIDIA Orin/Xavier and Snapdragon 865 platforms.

Colorado School of Mines

Jan 2024 – May 2024

Adjunct Faculty

Golden, CO

- Primary instructor in a grad-level class of nearly 100 students, CSCI564: Advanced Computer Architecture

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 150 students (per semester) 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

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**, Mehmet Belviranli, “Shared Memory-contention-aware Concurrent DNN Execution for Diversely Heterogeneous System-on-Chips”, 29th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming, **PPoPP 2024**
- Justin McGowen, **Ismet Dagli**, Neil Dantam, Mehmet Belviranli. “Scheduling for Cyber-Physical Systems with Heterogeneous Processing Units under Real-World Constraints” in 38th ACM International Conference on Supercomputing, **ICS 2024**
- Justin McGowen, **Ismet Dagli**, Neil Dantam, Mehmet Belviranli. "Constraint-aware resource management for cyber-physical systems" in Design, Automation and Test in Europe Conference, **DATE 2024**.
- Amid Morshedlou, **Ismet Dagli**, Jamal Rostami, Omid Moradian, Mehmet Belviranli, “Enhancing Reliability and Safety in Rock Excavation Using A Machine Learning Approach Through Wear Condition Identification” 58th US Rock Mechanics/Geomechanics Symposium, **ARMA 2024**
- H. Umut Suluhan, Serhan Gener, Alexander Fusco, Joshua Mack, **Ismet Dagli**, Mehmet E. Belviranli, Cagatay Edemen, Ali Akoglu. Title: A Runtime Manager Integrated Emulation Environment for Heterogeneous SoC Design with RISC-V Cores, in Heterogeneity in Computing Workshop (HCW), **IPDPS workshop 2024**
- Amid Morshedlou, **Ismet Dagli**, Austin Olltmans, Andrew Petruska, Mehmet Belviranli, Jamal Rostami, “Enhancing Safety Using Energy-Efficient Machine Learning Algorithms Through Prediction of Rock Type and Cutter Wear” Society for Mining, Metallurgy & Exploration: Annual Conference & EXPO, **SME Annual Conference - MINEXCHANGE 2024**
- **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), **HPDC Workshop 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 Workshop 2022**
- 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 Advanced Scientific Computing Research Workshop on the Management and Storage of Scientific Data, **ASCR 2022 Workshop**
- **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), **SC Workshop 2021**
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- 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” 40th IEEE/ACM International Conference On Computer Aided Design, **ICCAD 2021**

Posters

- **Ismet Dagli**, Mehmet E. Belviranli, “H-EYE: Holistic Performance Modeling for Diversely Scaled Systems”, Student Research Competition (SRC) at CGO, 2024
- **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

- CGO’24 ACM Student Research Competition (SRC) 2024, Finalist (selected as 3rd), \$200
- 59th MICRO ACM Student Research Competition (SRC) 2022, Finalist (selected as 3rd), \$200
- Travel awards/grants (PPoPP’24, HPDC’23, STOC’23, GSG Mines’21/23) nearly 4K \$
- ScienceSlam@SC21, Full registration for SC21 conference, accommodation, stipend, nearly 4K \$.
- GSG Mines, Travel grant, 900\$, 2021.
- Monthly stipend during bachelor degree by Turkish government, nearly 10K \$, Turkey, 2015-2019.

Talks/Presentations

- Ismet Dagli, The International Symposium on Code Generation and Optimization (CGO), Finalist Talk, 2024
- Ismet Dagli, IEEE/ACM International Symposium on Microarchitecture (MICRO), Finalist Talk, 2022

Personal Projects

Gumus R&G Autonomous Car Team

Aug 2020 - Current

- Role: Software Team lead

I lead a team of up to 30 students for the full-scale autonomous vehicle competition (Robotaxi). I lead the software team for any task, such as object detection and recognition, path planning, and 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 drones 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.

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'2023, ICS'2023, ISC-HPC'2023, RSDHA'23, DAC'2022, HIPS'2022, ICS'2022, RSDHA'22, IEEE Access, IEEE TPDS, Parallel Computing (PARCO) Journal, ACM TECS