

# Ismet Dagli

Computer Science Department  
Colorado School of Mines

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## Research Interest

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Diversely heterogeneous architectures, system programming, performance modeling, security & privacy, domain-specific architectures, autonomous vehicles, parallel programming paradigms on AI and robotics, energy-performance trade-off, deep learning, high-level synthesis, runtime systems, compiler optimization.

## Education

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### Colorado School of Mines

**Jan 2020 - Present**

*Golden, CO*

**(Exp. Graduate in 2025 Spring)**

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

### Boğaziçi University

**Sept 2015 - Dec 2019**

*Istanbul, Turkey*

- *Bachelor of Science in Computer Science and Engineering*

## Work Experience

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### 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 for CSCI564: Advanced Computer Architecture*

*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

Software Engineer Intern

Jul 2018 – Sept 2018

Istanbul, Turkey

- Supervisor: Tolga Büyükyazı
- Developed a CNN semantic segmentation model on Jetson TX2 for sky objects

## BGA Security

Security of IoT devices Intern

June 2017 – August 2017

Istanbul, Turkey

- Exploring the vulnerability testing on wearable IoT devices

## Publications

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- **Ismet Dagli**, Mehmet Belviranli, “HARNES: Holistic Resource Management for Diversely Scaled Edge Cloud Systems”, **under submission for a conference**
- **Ismet Dagli**, James Crea, Mehmet Belviranli, “MC<sup>3</sup>: Memory Contention based Covert Channel Communication on Shared DRAM System-on-Chips”, **accepted to DATE 2025**
- Alexander Cieslewicz, **Ismet Dagli**, Soner Seckiner, Jake Hertz, Bo Wu, Selcuk Kose, Mehmet E. Belviranli, “Extracting Neural Network Models via Contention-based Side Channel Attacks on Shared Memory Embedded System-on-Chips”, **under submission for IEEE TDSC journal**
- **Ismet Dagli**, Mehmet Belviranli, “Shared Memory-contention-aware Concurrent DNN Execution for Diversely Heterogeneous System-on-Chips”, Proceedings of the 29th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming, **PPoPP’24**
- 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 as short paper in **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, Jediaiah 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 Workshop 2022**
- **Ismet Dagli**, Mehmet E. Belviranli, “Multi-accelerator neural network inference in diversely heterogeneous embedded systems”; 2021 IEEE/ACM Redefining Scalability for Diversely Heterogeneous Architectures Workshop (RSDHA), **SC Workshop 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” 40th IEEE/ACM International Conference On Computer Aided Design, **ICCAD 2021**

## Posters

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- **Ismet Dagli**, James Crea, Mehmet Belviranli, “MC3: Memory Contention based Covert Channel Communication on Shared DRAM System-on-Chips”, **MICRO Workshop (CWIDCA)**
- **Ismet Dagli**, Mehmet E. Belviranli, “H-EYE: Holistic Performance Modeling for Diversely Scaled Systems”, Student Research Competition (SRC) at **CGO 2024, Finalist (selected top-3)**
- **Ismet Dagli**, Mehmet E. Belviranli, “Layer-wise Concurrent DNN Execution Characterization and Scheduling for Heterogeneous System-on-Chips”, C-MAPP 2023
- **Ismet Dagli**, Alexander Cieslewicz, 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”, Student Research Competition (SRC) at **MICRO 2022, Finalist (selected Top-3)**
- **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

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- **MLCommons Rising Star** (selected 41 out of 170 applicants, ~24%)
- **CGO’24 ACM Student Research Competition (SRC) 2024, Finalist** (selected as 3rd), \$200
- **MICRO’22 ACM Student Research Competition (SRC) 2022, Finalist** (selected as 3rd), \$200
- Travel awards/grants (SC’24/IPDPS’25, PPOPP’24, HPDC’23, STOC’23, GSG Mines’21/23) ~6K \$
- ScienceSlam@SC21, Full registration for SC21 conference, accommodation, stipend, ~4K \$
- Monthly stipend during bachelor degree by Turkish government, nearly 10K \$, Turkey, 2015-2019.

## Talks/Presentations

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- Ismet Dagli, Guest Lecturer at Heterogeneous Computing (CSCI-598), Colorado School of Mines 2023,
- Ismet Dagli, International Symposium on Code Generation and Optimization (CGO), Finalist Talk, 2024
- Ismet Dagli, IEEE/ACM International Symposium on Microarchitecture (MICRO), Finalist Talk, 2022

## Group (as mentor) & Personal Projects

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### **Fatima Fellowship mentor** (Role: Team Lead)

**Sept 2023 - Present**

- I lead a group of students, underrepresented and international three students including two female students, to run LLM models at the edge devices to run inference by intelligently managing data communication through DRAM and storage.

### **High-school Research mentor** (Role: Team Lead)

**May 2023 - Present**

- I lead two students, including one female student, to develop efficient LLM runtime selection model mechanism

### **Google ExploreCSR mentor** (Role: Team Lead)

**Jan 2023 - May 2024**

- I led two senior and junior undergrads to run DNN efficiently on Google Coral Dev Boards.

### **Gumus R&G Autonomous Car Team** (Role: Software Team lead)

**Aug 2020 - Aug 2024**

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

## Skills

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- **Programming Skills:** C++, Python, CUDA, C, Java, ROS, Verilog,
- **Tools & Technologies:** Linux, TensorRT, Jetson platforms, OpenMP, Z3 Solver, Keras, Tensorflow, Caffe, OpenCV
- **Grant/proposal writing:** I helped my advisor (Dr. Belviranli) on several grant/proposal, including NSF CAREER, NSF SaTC, and SRC AIHW, and collaboration proposals with industry companies

## Service

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- **Committee Member:** AE Committee member for FAST'25 EuroSys'25 Fall and Spring
- **Organizing Committee:** RSDHA'21/'22/'23 web chair
- **External Reviewer for:** HiPC'25 Poster, AI4SC'24, 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