Justin Morris

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Education

B.S. Computer Engineering, University of California, San Diego 2018
PhD Computer Engineering, University of California, San Diego and San Diego State University Current

Teaching Experience

CSE TA, University of California, San Diego, San Diego, CA 2018-2020

- CSE 140, 140L, 141, 141L, computer hardware classes that introduces students to HDL's such as Verilog, System Verilog, and BSV as well as an introduction to computer architecture.
- Helped in the development of a new computer architecture course, CSE 142/L, focusing on how software engineers can take advantage of underlying hardware for performance gains.

SEE Lab Research Intern, University of California, San Diego, San Diego, CA 2017-2019

- Worked on researching how to improve the efficiency and accuracy of Hyperdimensional (HD) Computing.

CSE Tutor, University of California, San Diego, San Diego, CA 2017-2018

- CSE 140L, 4 quarters

Publications

A. Sokolova, M. Imani, A. Huang, R. Garcia, **J. Morris**, T. Rosing, B. Aksanli, MACcelerator: Approximate Arithmetic Unit for Computational Acceleration. International Symposium on Quality Electronic Design (ISQED). 2021. ISQED 2021

J. Morris, Y. Hao, R. Fernando, M. Imani, B. Aksanli , T. Rosing, Locality-based Encoder and Model Quantization for Efficient Hyper-Dimensional Computing. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems. 2021. TCAD 2021

J. Morris, K. Ergun, B. Khaleghi, M. Imani, B. Aksanli , T. Rosing, HyDREA: Towards More Robust and Efficient Machine Learning Systems with Hyperdimensional Computing. Design, Automation and Test in Europe (DATE). 2021. DATE 2021

Y. Guo, M. Imani, J. Kang, S. Salamat, **J. Morris**, B. Aksanli, Y. Kim, T. Rosing, HyperRec: Efficient Recommender Systems with Hyperdimensional Computing. IEEE Asia and South Pacific Design Automation Conference (ASP-DAC). 2021. ASP-DAC 2021

S. Gupta, **J. Morris**, M. Imani, R. Ramkumar, J. Yu, A. Tiwari, B. Aksanli, T. Rosing, "THRIFTY: Training with Hyperdimensional Computing across Flash Hierarchy", IEEE/ACM International Conference On Computer Aided Design (ICCAD), 2020. ICCAD 2020

J. Morris, Y. Hao, S. Gupta, R. Ramkumar, J. Yu, M. Imani, B. Aksanli, T. Rosing, "Multi-label HD Classification in 3D Flash". IEEE/IFIP International Conference on VLSI and System-on-Chip (VLSI-SoC), 2020. VLSI-SoC 2020

M. Imani, **J. Morris**, H. Shu, T. Rosing, "AdaptHD: Adaptive Efficient Retraining for Brain-Inspired Hyperdimensional Computing" IEEE Biomedical Circuits and Systems Conference (BioCAS), 2019. BioCAS 2019

J. Morris, M. Imani, S. Bosch, A. Thomas, H. Shu, T. Rosing, "CompHD: Efficient Hyperdimensional Computing Using Model Compression". IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED), 2019. ISLPED 2019

M. Imani, **J. Morris**, J. Messerly, H. Shu, Y. Deng, T. Rosing, "BRIC: Locality-based Encoding for Energy-Efficient Brain-Inspired Hyperdimensional Computing", *IEEE/ACM Design Automation Conference (DAC)*, 2019. (24.3% Acceptance Rate) DAC 2019

M. Imani, T. Nassar, **J. Morris**, T. Rosing, "DNA sequencing using Brain-inspired Hyperdimensional Computing", *GOMACTech Conference*, 2019. GOMAC 2019

M. Imani, **J. Morris**, H. Shu, T. Rosing, "Efficient Associative Search in Brain-Inspired Hyperdimensional Computing", *IEEE Design & Test*, 2018. D&T 2018

Mentorship

Yilun Hao, B.S. Computer Science Stanford PhD
Xincheng Shen, B.S. Computer Science M.S. UCSD
Gadi Rosen, B.S. Computer Science
Amirhossein Rashidi-Moakhar, B.S. Computer Science
Si Thu Kaung Set, B.S. Computer Science
Kangxian Xie, B.S. Computer Science
Roshan Fernando, B.S. Computer Science
Leyi (Sherry) Shang, B.S. Computer Science
Helen Shu, B.S. Computer Science

Awards

Provost Honors: FA 15, WI 16, WI 17, SP 17, FA 17, WI 18, SP 18

Honorable Mention in the 2020 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) Competition — 2020

SDSU University Graduate Fellowship — 2020-2021

Projects

Autonomous Mars Rover, Yonder Dynamics — 2017-2018

- Implemented a 2-D depth map and decision algorithm over the depth map to enable a mars rover to autonomously find the best path to a set of waypoints without human interaction.

MIPS CPU, CSE 148 — 2018

- Implemented a CPU designed to run the MIPS ISA that included improvements such as Branch Prediction, Victim Cache, Hardware Prefetching, and Superscalar

Autonomous RC Car, ECE 196 — 2018

- Modified a RC car to learn how to drive on any given course by training a Neural Network with data taken from driving the RC car manually

Bit Coin Mining FPGA, ECE 111 — 2017

- Implemented a Bit Coin mining logic design on a FPGA with System Verilog to learn more about logic design such as pipelining

Community Service

Tutor, Education in Action, San Diego, CA — 2011-2015

- Tutored an elementary student for 4 years through a school club. I had the pleasure of seeing the same student by his parent's request for all 4 years. I helped teach him reading comprehension and basic math such as, addition, subtraction, multiplication, and division.