

ARYAN DESHWAL

aryandeshwal.github.io • aryan.deshwal@wsu.edu

EDUCATION

Ph.D. Student, Computer Science, 4.0 GPA

Washington State University

2018–Present

Pullman, Washington

MS, Computer Science

Washington State University

2018–2020

Pullman, Washington

Thesis: A Learning to Search Framework for Multi-Objective Optimization of Manycore Systems Design

Bachelor of Technology, Mathematics and Computing

Delhi Technological University

2013–2017

New Delhi, India

RESEARCH EXPERIENCE

Research Assistant

EECS Department, Washington State University

August 2018–Present

Pullman, Washington

Advisor: Prof. Jana Doppa

Undergraduate Research Intern

Department of Biotechnology, I.I.T. Roorkee

June 2017–August 2017

Roorkee, India

Advisor: Prof. Pravindra Kumar

TEACHING EXPERIENCE

Teaching Assistant

EECS Department, Washington State University

Pullman, Washington

- CptS 570: Introduction to Machine Learning (Fall-2019)

INDUSTRIAL EXPERIENCE

Research and Development Engineer

Works Applications

October 2017–May 2018

Tokyo, Japan

Software Engineering Intern

Samsung

June 2016–August 2016

Bengaluru, India

AWARDS AND HONORS

- Mahmoud Dillsi Graduate Fellowship, 2020
- Top Reviewer Award, International Conference on Machine Learning (ICML), 2020
- Outstanding Innovation in Technology Award (for my MS Dissertation), WSU, 2020
- Outstanding Teaching Assistant in Computer Science, College of Engineering, WSU, 2020
- Outstanding Teaching Assistant in Computer Science, School of EECS, WSU, 2020
- GPSA Graduate Research Assistant Excellence Award, Washington State University, 2020
- Alfred Suksdorf Fellowship, Washington State University, 2018-2020
- Travel Award from AAAI Conference on Artificial Intelligence (AAAI), 2020

- Travel Award from Conference on Neural Information Processing Systems (NeurIPS), 2019
- Travel Award from International Joint Conference on Artificial Intelligence (IJCAI), 2019

PUBLICATIONS

Conference Papers

1. **Aryan Deshwal**, Syrine Belakaria, Jana Doppa. Mercer Features for Efficient Combinatorial Bayesian Optimization. *Upcoming in Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI), 2021.*
2. **Aryan Deshwal**, Syrine Belakaria, Janardhan Rao Doppa, and Alan Fern. Optimizing Discrete Spaces via Expensive Evaluations: A Learning to Search Framework. *Proceedings of Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020.*
3. Syrine Belakaria, **Aryan Deshwal**, Nitthilan Kannappan Jayakodi, and Janardhan Rao Doppa. Uncertainty-Aware Search Framework for Multi-Objective Bayesian Optimization. *Proceedings of Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020.*
4. Syrine Belakaria, **Aryan Deshwal**, and Janardhan Rao Doppa, Multi-Fidelity Multi-Objective Bayesian Optimization: An Output Space Entropy Search Approach. *Proceedings of Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020.*
5. Syrine Belakaria[†], Zhiyuan Zhou[†], **Aryan Deshwal**, Janardhan Rao Doppa, Deuk Heo, and Partha Pratim Pande. Design of Multi-Output Switched-Capacitor Voltage Regulator via Machine Learning. *Proceedings of Twenty-Third IEEE/ACM Design, Automation and Test in Europe Conference (DATE), 2020.* [†] denotes equal contribution.
6. Paul Bogdan, Fan Chen, **Aryan Deshwal**, Janardhan Rao Doppa, Biresh Kumar Joardar, Hai (Helen) Li, Shahin Nazarian, Linghao Song, Yao Xiao. Taming Extreme Heterogeneity via Machine Learning based Design of Autonomous Manycore Systems. *International Conference on Hardware/Software Codesign and System Synthesis Companion (CODES), pp 21:1-21:10, 2019.*
7. Syrine Belakaria, **Aryan Deshwal**, and Janardhan Rao Doppa. Max-value Entropy Search for Multi-Objective Bayesian Optimization. *Proceedings of Thirty-Third International Conference on Neural Information Processing Systems (NeurIPS), pp 7823-7833, 2019.*
8. **Aryan Deshwal**, Janardhan Rao Doppa, and Dan Roth. Learning and Inference for Structured Prediction: A Unifying Perspective. *Proceedings of Twenty-Eighth International Joint Conference on Artificial Intelligence (IJCAI), pp 6291-6299, 2019.*
9. Chao Ma, F A Rezaul Rahman Chowdhury, **Aryan Deshwal**, Md Rakibul Islam, Janardhan Rao Doppa, and Dan Roth. Randomized Greedy Search for Structured Prediction: Amortized Inference and Learning. *Proceedings of Twenty-Eighth International Joint Conference on Artificial Intelligence (IJCAI), pp 5130-5138, 2019.*

Journal Papers

1. **Aryan Deshwal**, Nitthilan Kannappan Jayakodi, Biresh Joardar, Janardhan Rao Doppa, Partha Pratim Pande. MOOS: A Multi-Objective Design Space Exploration and Optimization Framework for NoC enabled Manycore Systems. *ACM Transactions on Embedded Computing Systems (TECS), 18(5s): 77:1-77:23, 2019.*
2. Nitthilan Kannappan Jayakodi, Syrine Belakaria, **Aryan Deshwal**, and Janardhan Rao Doppa. Design and Optimization Framework to Trade-off Energy and Accuracy of Inference on Mobile Platforms via Pretrained Neural Networks. *ACM Transactions on Embedded Computing Systems (TECS), 19(1): 4:1-4:24, 2020.*

Workshop Papers

1. **Aryan Deshwal**, Syrine Belakaria, Janardhan Rao Doppa. Scalable Combinatorial Bayesian Optimization with Tractable Statistical models, 2020. <https://arxiv.org/abs/2008.08177>. *Upcoming in Proceedings of NeurIPS Workshop on Engineering Modeling, Simulation, and Design, 2020*.
2. Syrine Belakaria, **Aryan Deshwal**, Janardhan Rao Doppa. Information-Theoretic Multi-Objective Bayesian Optimization with Continuous Approximations, 2020. <https://arxiv.org/abs/2009.05700>. *Upcoming in Proceedings of NeurIPS Workshop on Engineering Modeling, Simulation, and Design, 2020*.
3. Syrine Belakaria, **Aryan Deshwal**, Janardhan Rao Doppa. Max-value Entropy Search for Multi-Objective Bayesian Optimization with Constraints, 2020. <https://arxiv.org/abs/2009.01721>. *Upcoming in Proceedings of NeurIPS Workshop on Machine Learning and the Physical Sciences, 2020*.
4. **Aryan Deshwal**, Syrine Belakaria, Janardhan Rao Doppa, and Alan Fern. Optimizing Discrete Spaces via Expensive Evaluations: A Learning to Search Framework. *ICML Workshop on Real World Experiment Design and Active Learning*, 2020.
5. Syrine Belakaria, **Aryan Deshwal**, and Janardhan Rao Doppa. Max-value Entropy Search for Multi-Objective Bayesian Optimization. *ICML Workshop on Real World Experiment Design and Active Learning*, 2020.
6. Syrine Belakaria, **Aryan Deshwal**, and Janardhan Rao Doppa. Uncertainty aware Search framework for Multi-Objective Bayesian Optimization with Constraints. *ICML Workshop on Automated Machine Learning (AutoML)*, 2020.

GRANT PROPOSALS

- Jana Doppa (PI) and Partha Pratim Pande. *Collaborative Research: Medium: Exploiting Synergies Between Machine-Learning Algorithms and Hardware Heterogeneity for High-Performance and Reliable Manycore Computing*. National Science Foundation (NSF), Core Program. \$600K (5/2020–5/2023). Funded.
 - My research work on machine learning for combinatorial design optimization by combining domain knowledge and data from cycle-accurate simulations was a central part of this proposal.

CONFERENCE TALKS

- Learning and Inference for Structured Prediction: A Unifying Perspective @ IJCAI Conference, Macao, China, 2019.
- Randomized Greedy Search for Structured Prediction: Amortized Inference and Learning @ IJCAI Conference, Macao, China, 2019.
- MOOS: A Multi-Objective Design Space Exploration and Optimization Framework for NoC enabled Manycore Systems @ Embedded Systems Week Conference, New York City, 2019.
- Optimizing Discrete Spaces via Expensive Evaluations: A Learning to Search Framework @ AAAI Conference, New York City, 2020.

PROFESSIONAL AND OUTREACH ACTIVITIES

Program Committee Member

- Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI), 2021
- International Conference on Learning Representations (ICLR), 2021

- Thirty-Fourth Conference on Neural Information Processing Systems (NeurIPS), 2020
- Thirty-Seventh International Conference on Machine Learning (ICML), 2020
- Twenty-Ninth International Joint Conference on Artificial Intelligence (IJCAI), 2020

Conference and Journal Reviewer

- Reviewer for NeurIPS-2019, UAI-2019, IJCAI-2019, KDD-2019, AISTATS-2019, ESWEK-2019, AAAI-2020, AISTATS-2020, UAI-2020, KDD-2020
- Journal of Artificial Intelligence Research (JAIR), 2019
- IEEE Journal of Selected Topics in Signal Processing, 2019

Organizer

- Volunteer for International Conference on Machine Learning (ICML), 2019
- Volunteer for International Joint Conference on Artificial Intelligence (IJCAI), 2019

SKILLS

- **Programming Languages.** Python, Bash, C/C++, HTML/CSS, L^AT_EX, Java, MATLAB
- **Tools/Packages.** Git, SQL, PyTorch, TensorFlow, Python data science tools