ZICHEN (VINCENT) ZHANG

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SELECTED RESEARCH

Time Discretization in Continuous-Time Reinforcement Learning NeurIPS 2023 & Ongoing
- Analyzed the impact of time discretization in policy evaluation for continuous-time stochastic LQR
- Uncovered a fundamental trade-off between approximation and statistical error in value estimation
- Ongoing: analyze the trade-off in Temporal Differencing methods

Decentralized Cross-Entropy Method for Continuous-Action Planning NeurIPS 2022
- Generalized the Cross-Entropy Method to increase sample efficiency in planning

Reducing Selection Bias in Counterfactual Reasoning NeurIPS 2019 CausalML Workshop (Spotlight)
- Developed a method to reduce selection bias in counterfactual reasoning
- Achieved state-of-the-art results on a benchmark dataset for estimating individual treatment effects

Fast and Accurate Salient Object Detection (SOD) CVPR 2019 & Best Paper at Pattern Recognition 2020
- Designed experiments to understand the utility of a new loss function for boundary refinement
- ReSidual U-blocks enables training a deep neural net from scratch for SOD

Interactive Object and Task Learning for Contact Motions on Unstructured Surfaces ICRA 2019
- One of five finalists of the KUKA innovation challenge 2018
- Led the development of incremental object detection, GUI and system integration

INDUSTRY EXPERIENCE

Research Intern 08/2020 - 04/2022
Huawei Noah's Ark Lab Edmonton, AB
- Conducted and published research in reinforcement learning
- Mentored undergraduate interns in implementing reinforcement learning algorithms

Machine Learning Scientist Intern 05/2018 - 03/2019
Medo.ai, later acquired by Exo Edmonton, AB
- Lead developer of the deep learning infrastructure
- Developed and deployed a medical image segmentation method on AWS Stack

Software Developer 06/2013 - 05/2015
NTT Data Inc. Halifax, NS
- Worked on a multi-tier web-based information management system, on a two-week release cycle
- Led a team of three to win the internal annual Hackathon
  - Utilized Puppet to reduce the Dev Environment setup time from 1-2 days to 1 second
  - Pitched the idea to VP of R&D, resulting in its promotion to a production project

Research Engineer 11/2012 - 04/2013
Mechanical Engineering Department, Dalhousie University Halifax,NS
- Developed the ROS driver for Robucar (a ground vehicle) https://sourceforge.net/projects/acm-robucar
- Designed and developed C++ teleoperation programs with ROS for iRobot Create robot and Robucar

EDUCATION

Ph.D. in Computing Science 2018 - present
University of Alberta. Supervisors: Dale Schuurmans, Martin Jagersand Edmonton, AB, Canada

M.Sc. in Computing Science 2015 - 2017
University of Alberta. Supervisors: Dana Cobzas, Martin Jagersand Edmonton, AB, Canada

M.A.Sc. in Electrical Engineering 2009 - 2012
Dalhousie University. Supervisor: Jason Gu Halifax, NS, Canada

B.E. in Electrical Engineering 2005 - 2009
Huazhong University of Science and Technology (HUST) Wuhan, China

Honors & awards

NeurIPS 2023 Top Reviewer	2023
Alberta Graduate Excellence Scholarship	2023
NeurIPS 2023 Scholar Award	2023
NeurIPS 2022 Scholar Award	2022
NSERC Canada Graduate Scholarship-Doctoral (CGS-D), University of Alberta	2018-2022
Alberta Innovates - Graduate Student Scholarship (AIGSS - PhD), University of Alberta	2018-2022
NeurIPS 2019 Travel Award	2019
President's Doctoral Prize of Distinction, University of Alberta	2018,2019
Science Graduate Scholarship, University of Alberta	2016,2018
NSERC Canada Graduate Scholarships–Master's Program (CGS-M), University of Alberta	2016-2017
Alberta Innovates Technology Futures Scholarship (AITF - Master), University of Alberta	2016-2017
Walter H Johns Graduate Fellowship, University of Alberta	2016

Selected publications

Google Scholar: https://scholar.google.com/citations?user=nSh2eD4AAAAJ&hl=en

*: equal contribution, †: equal advising

1. Managing Temporal Resolution in Continuous Value Estimation: A Fundamental Trade-off
   Zichen Zhang*, Francesco Zanini*, Junxi Zhang*, Alex Ayoub*, Johannes Kirschner*, Masood Dehghan*, Dale Schuurmans*
   NeurIPS 2023. A preliminary version appeared at the ICML 2022 ReALML Workshop.
2. A Simple Decentralized Cross-Entropy Method
   Zichen Zhang, Jun Jin, Martin Jagersand, Jun Luo†, Dale Schuurmans†
   Conference on Neural Information Processing Systems (**NeurIPS**), 2022.
3. Learning State Conditioned Linear Mappings for Low-Dimensional Control of Robotic Manipulators
   Michael P., Kerrick J., ***Zichen Zhang***, Laura P., Masood D., Faezeh H., Martin J.
   International Conference on Robotics and Automation (**ICRA**), 2023
4. U2-Net: Going deeper with nested U-structure for salient object detection
   Xuebin Qin, ***Zichen Zhang***, Chenyang Huang, Masood Dehghan, Osmar R Zaiane, Martin Jagersand
   Best Paper Award, In Pattern Recognition, 2020
5. Reducing Selection Bias in Counterfactual Reasoning for Individual Treatment Effects Estimation
   Zichen Zhang, Qingfeng Lan, Lei Ding, Yue Wang, Negar Hassanpour, Russ Greiner
   Spotlight Paper, NeurIPS CausalML Workshop 2019
6. BASNet: Boundary Aware Salient Object Detection
   Xuebin Qin, ***Zichen Zhang***, Chenyang Huang, Chao Gao, Masood Dehghan and Martin Jagersand
   IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2019
7. Online Tool and Task Learning via Human Robot Interaction
   Masood Dehghan*, ***Zichen Zhang****, Mennatullah Siam*, Jun Jin, Laura Petrich, Martin Jagersand
   International Conference on Robotics and Automation (**ICRA**), 2019
8. End-to-end detection-segmentation network with ROI convolution
   Zichen Zhang, Min Tang, Dana Cobzas, Dornoosh Zonoobi, Martin Jagersand, Jacob L. Jaremko
   International Symposium on Biomedical Imaging (**ISBI**), 2018
9. Segmentation-by-Detection: A Cascade Network for Volumetric Medical Image Segmentation
   Min Tang, ***Zichen Zhang***, Dana Cobzas, Martin Jagersand, Jacob L. Jaremko
   International Symposium on Biomedical Imaging (**ISBI**), 2018