Zhaocong **Yuan**

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Education

University of Toronto — *Toronto, Canada*

MASc in Aerospace Science and Engineering — *Sept. 2020 - Nov. 2022*

- Supervisor: Prof. Angela P. Schoellig
- Thesis: Benchmarking Reinforcement Learning for Safe Robotics: Constraints, Robustness and Transfer

University of Toronto — *Toronto, Canada*

BASc in Engineering Science (Robotics) — *Sept. 2015 - Jun. 2020*

- CGPA: 3.91 / 4.0, graduated with High Honours
- Supervisor: Prof. Sanja Fidler
- Thesis: Emergent Communication Behaviors in Multi-Agent Systems.

Skills

Programming	Python, Java, C++, SQL, HTML, CSS, Bash, MATLAB, LaTeX
Software & Tools	PyTorch, Tensorflow, PyBullet, Pandas, sklearn, Docker, ZooKeeper, AWS, Hadoop, Spark, Git, OpenCV, ROS, Linux
Languages	English, Mandarin Chinese, Cantonese

Experience

Qualcomm — *Markham, Canada*

Machine Learning System Software Engineer — *Feb. 2023 - Present*

- Worked on multi-modal self-supervised pre-training and task adaptation with vision transformers, benchmarked on common image classification, segmentation, audio classification, and speech separation tasks.
- Worked on model distillation, parameter efficient fine-tuning, and quantization of foundation models for low-power mobile use cases.

Nvidia Toronto AI Lab — *Toronto, Canada*

Deep Learning Intern — *Sept. 2018 - Sept. 2019*

- Worked on synthetic data generation, sim-to-real domain transfer/adaptation, with a special focus on self-driving perception tasks.
- Worked on neural physics engine, trajectory prediction and relational modeling, implemented and benchmarked variants of Graph Neural Networks.
- Developed a codebase for unsupervised distribution matching on videos, crafted several learning environments for physics and traffic simulation.

Apple Inc. — *Seattle, U.S.*

Software Engineer — *May 2018 - Sept. 2018*

- Improved a user intent matching component in Siri pipeline, reduced error rate by 1.5% over production model.
- Experimented with various ranking models using Learning-to-Rank and deep learning techniques.
- Designed an experiment workflow for fast prototyping, model tuning and visualization.

Data-Driven Decision Making Lab (Prof. Scott Sanner) — *Toronto, Canada*

Research Intern — *May 2017 - Sept. 2017*

- Built image classifiers with TensorFlow and Keras on MNIST and CIFAR-10, developed visualizations on learnt features.
- Applied deep learning on text classification with TED Talk scripts and Amazon Reviews, experimented and benchmarked performances over different networks including convolutional, recurrent and attentional architectures.
- Designed a hierarchical span-based attention network, increased explainability and classification accuracy by 1-2%.

Publications

Safe-Control-Gym: A Unified Benchmark Suite for Safe Learning-Based Control and Reinforcement Learning in Robotics

Zhaocong Yuan, Adam W. Hall, Siqi Zhou, Lukas Brunke, Melissa Greeff, Jacopo Panerati Angela P. Schoellig

Accepted to *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022

Safe Learning in Robotics: From Learning-Based Control to Safe Reinforcement Learning
Lukas Brunke, Melissa Greeff, Adam W. Hall, **Zhaocong Yuan**, Siqi Zhou, Jacopo Panerati Angela P. Schoellig
Published in *Annual Review of Control, Robotics, and Autonomous Systems*, 2022

Meta-Sim: Learning to Generate Synthetic Datasets
Amlan Kar, Aayush Prakash, Ming-Yu Liu, Eric Cameracci, **Justin Yuan**, Matt Rusiniak, David Acuna, Antonio Torralba, Sanja Fidler
Accepted to *International Conference on Computer Vision (ICCV)*, 2019 (Oral)

Awards

Vector Scholarships in Artificial Intelligence, Vector Institute 2020
University of Toronto Dean's Honours List 2015 - 2020
University of Toronto Excellence Awards (UTEA) 2017
Garnet W. McKee-Lachlan Gilchrist Scholarship, UofT 2017
Wallberg Undergraduate Scholarships, UofT 2016
University of Toronto Scholar Award 2015

Activities

ICRA 2022 Workshop on Releasing Robots into the Wild: Simulations, Benchmarks, and Deployment
Co-organizer *May 2022*

NeurIPS 2021 Workshop on Deployable Decision Making in Embodied Systems
Committee team *Dec. 2021*

IROS 2021 Workshop on Safe Real-World Robot Autonomy
Volunteer *Sept. 2021*

UofT Machine Intelligence Student Team
Co-founder/VP Marketing/VP Academics *Nov. 2016 - June 2019*
- Built a machine learning community for undergrad students, developed 6 workshops on deep learning fundamentals.

UofT IEEE Student Branch
Event Director/Conference and Hackathon Director *May 2016 - Feb. 2019*
- Organized the 2017 and 2019 "Hello Con!" Programming Conference with over 100 participants.
- Hosted the 2016 IEEEXtreme Programming Competition U of T branch with 4 competing teams.