

Tianshu Kuai

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Education

Sep 2024 – 2029	PhD in Computer Science , Université de Montréal & Mila <i>Advisor: Prof. Noam Aigerman</i>
Sep 2022 – Dec 2023	MSc in Applied Computing , University of Toronto <i>cGPA: 4.00 / 4.00</i> <i>Advisor: Prof. Igor Gilitschenski</i>
Sep 2017 – Apr 2022	Bachelor of Applied Science in Engineering Science , University of Toronto Robotics Major , Artificial Intelligence Minor <i>Major GPA: 3.80 / 4.00, cGPA: 3.73 / 4.00</i> <i>Thesis Advisor: Prof. Steven L. Waslander</i>

Experience

May 2023 - Apr 2024	Samsung AI Center Toronto Research Intern <i>Supervised by Dr. Alex Levinshtein, Samsung AI Center Toronto</i> <ul style="list-style-type: none">Research on diffusion model based real-world image restoration and enhancement
May 2022 - Apr 2024	University of Toronto 3D Computer Vision Researcher <i>Supervised by Prof. Igor Gilitschenski, Toronto Intelligent Systems Lab (TISL)</i> <ul style="list-style-type: none">Research on 3D scene representation and manipulationProposed a template-free method [3] for building animatable 3D models for arbitrary types of articulated and deformable objects from a collection of monocular videos, which allows users to animate reconstructed objects in 3D for content creation
May 2021 - Apr 2023	University of Toronto Computer Vision Researcher <i>Supervised by Prof. Steven L. Waslander, Toronto Robotics and Artificial Intelligence Lab (TRAILab)</i> <ul style="list-style-type: none">Research on self-supervised LiDAR semantic segmentation for autonomous driving, and contributed to the development of a novel method [2] that outperforms state-of-the-art 2D-to-3D representation learning frameworksDesigned and supported the development of high-performance LiDAR 3D object detection models for autonomous vehicles. PDV [1] achieved state-of-the-art multi-class 3D object detection results on Waymo Open Dataset upon publication
July 2021 - June 2022	aUToronto Computer Vision Engineer <i>University of Toronto Autonomous Driving Group, SAE/GM AutoDrive Challenge</i> <ul style="list-style-type: none">Research on fast and lightweight 3D perception models on collected dataWorked on deploying real-time perception models on autonomous vehicles
May 2020 - May 2021	Qualcomm Machine Learning Research Intern <i>Supervised by Dr. Shaojie Zhuo, Machine Learning Research Team</i> <ul style="list-style-type: none">Proposed several efficient deep learning models for audio processingApplied state-of-the-art methods for neural network compressionContributed to NPU software compiler pipeline development

Publications

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| 2024 | [4] | T. Kuai , S. Honari, I. Gilitschenski, and A. Levinshstein, "Towards Unsupervised Blind Face Restoration using Diffusion Prior," <i>arXiv</i> 2024. |
| 2023 | [3] | T. Kuai , A. Karthikeyan, Y. Kant, A. Mirzaei, and I. Gilitschenski, "CAMM: Building Category-Agnostic and Animatable 3D Models from Monocular Videos," <i>CVPRW</i> 2023. |
| | [2] | A. Mahmoud, J. S. K. Hu, T. Kuai , A. Harakeh, L. Paull, and S. L. Waslander, "Self-Supervised Image-to-Point Distillation via Semantically Tolerant Contrastive Loss," <i>CVPR</i> 2023. |
| 2022 | [1] | J. S. K. Hu, T. Kuai , and S. L. Waslander, "Point Density-Aware Voxels for LiDAR 3D Object Detection," <i>CVPR</i> 2022. |

Academic Service

Reviewer | CVPR 2023, ECCV 2024, WACV (2024, 2025), AAAI 2025

Honors

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| Jan 2020 | University of Toronto Engineering Competition <ul style="list-style-type: none">Awarded the second prize in the senior design competition |
| Mar 2019 | NSERC Undergraduate Student Research Award <ul style="list-style-type: none">Undergraduate student research award from Natural Sciences and Engineering Research Council of Canada (NSERC) |
| Feb 2019 | University of Toronto Excellence Award <ul style="list-style-type: none">Awarded to University of Toronto undergraduate students based on research aptitude |
| Sep 2017 | University of Toronto Engineering Entrance Scholarship <ul style="list-style-type: none">Scholarship for top engineering candidates pursuing studies at the University of Toronto |

Selected Projects

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| 2021 | Real Time Audio Denoiser <ul style="list-style-type: none">A model built using convolutional neural networks with an encoder-decoder structureThe model takes the noisy speech as input and produces a de-noised speech as the outputAchieved good performance on various types of signals with only around 33k parameters |
| 2019 | Autonomous Ball Dispensing Mobile Machine <ul style="list-style-type: none">Started from literature and market survey, through professional engineering decision-making tools to successfully converge to a fully autonomous ball dispensing machine prototypeUsed PIC18F4620 with MPLAB X and Arduino Nano to enable movement of its components, real-time clock, user Interface, and IR Remote ControlCan potentially be used for automatic delivery and dispensing in warehouses |