ZIYI WU

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EDUCATION

University of Toronto, Toronto, ON, Canada — Sept. 2021 – Present
Ph.D. in Computer Science
Advisor: Prof. Igor Gilitschenski

Tsinghua University, Beijing, P.R.China — Aug. 2017 – Jun. 2021
B.Eng. in Automation
Advisor: Prof. Jiwen Lu

EXPERIENCE

Snap Research, LA — Jun. 2024 – Present
Research Intern — Mentor: Dr. Aliaksandr Siarohin
Controllable video generation

Google Research, Toronto — Dec. 2023 – Jun. 2024
Student Researcher (Remote) — Mentor: Dr. Thomas Kipf
3D-aware controllable image generation

Toronto Intelligent Systems Lab, University of Toronto — Sept. 2022 – Present
Graduate Research Assistant — Supervisor: Prof. Igor Gilitschenski
3D vision, robotics

Vector Institute — Sept. 2021 – Present
Student Researcher

People, AI and Robotics Group, University of Toronto — Sept. 2021 – Aug. 2022
Graduate Research Assistant — Supervisor: Prof. Animesh Garg & Prof. Andrea Tagliasacchi
3D vision, robotics

OpenMMLab, SenseTime Ltd. — Mar. 2021 – Aug. 2021
Research Intern — Mentor: Dr. Kai Chen, Dr. Wenwei Zhang
Develop open source codebase for 3D scene understanding (MMDetection3D)

Geometric Computation Group, Stanford University — Jun. 2020 – Dec. 2020
Research Intern (Remote) — Supervisor: Prof. Leonidas J. Guibas
3D adversarial attack and defense in point cloud

Intelligent Vision Group, Tsinghua University — Apr. 2019 – Jun. 2021
Undergraduate Researcher Assistant — Supervisor: Prof. Jiwen Lu
Efficient design for 2D object detectors

SELECTED PUBLICATIONS & MANUSCRIPTS

* indicates equal contribution/supervision

Journal Papers

1. **Learning Efficient Binarized Object Detectors with Information Compression**
Ziwei Wang, Jiwen Lu, **Ziyi Wu**, Jie Zhou.
T-PAMI, 2021.

Conference Papers

1. **Neural Assets: 3D-Aware Multi-Object Scene Synthesis with Image Diffusion Models**
Ziyi Wu, Yulia Rubanova, Rishabh Kabra, Drew A. Hudson, Igor Gilitschenski, Yusuf Aytar, Sjoerd van Steenkiste, Kelsey Allen, Thomas Kipf.
NeurIPS, 2024 (Spotlight).

2. **LEOD: Label-Efficient Object Detection for Event Cameras**
Ziyi Wu, Mathias Gehrig, Qing Lyu, Xudong Liu, Igor Gilitschenski.
CVPR, 2024.

3. **SPAD: Spatially Aware Multiview Diffusers**
Yash Kant, **Ziyi Wu**, Michael Vasilkovsky, Guocheng Qian, Jian Ren, Riza Alp Guler, Bernard Ghanem, Sergey Tulyakov, Igor Gilitschenski, Aliaksandr Siarohin.
CVPR, 2024.

4. **SlotDiffusion: Object-Centric Generative Modeling with Diffusion Models**
Ziyi Wu, Jingyu Hu*, Wuyue Lu*, Igor Gilitschenski, Animesh Garg.
NeurIPS, 2023 (Spotlight) | *ICLR@NeSy-GeMs Workshop*, 2023.

5. **SlotFormer: Unsupervised Visual Dynamics Simulation with Object-Centric Models**
Ziyi Wu, Nikita Dvornik, Klaus Greff, Thomas Kipf*, Animesh Garg*.
ICLR, 2023 | *UAI@CRL Workshop*, 2022 | *ECCV@MVCS Challenge*, 2022.

6. **Breaking Bad: A Dataset for Geometric Fracture and Reassembly**
Silvia Sellán*, Yun-Chun Chen*, **Ziyi Wu***, Animesh Garg, Alec Jacobson.
NeurIPS Datasets and Benchmarks Track (Featured Paper Presentation), 2022.

7. **Instance Similarity Learning for Unsupervised Feature Representation**
Ziwei Wang, Yunsong Wang, **Ziyi Wu**, Jiwen Lu, Jie Zhou.
ICCV, 2021.

8. **BiDet: An Efficient Binarized Object Detector**
Ziwei Wang, **Ziyi Wu**, Jiwen Lu, Jie Zhou.
CVPR, 2020.

INVITED TALK

Invited talk in Prof. Kun Zhang's group Feb. 2023
Invited talk in Neuroinformatics Group Nov. 2022
Winner talk at ECCV@MVCS Workshop CLEVRER Track Oct. 2022
SlotFormer: Unsupervised Visual Dynamics Simulation with Object-Centric Models

HONORS & AWARDS

- **Outstanding reviewer at NeurIPS 2023** 2023
- University of Toronto Mississauga Travel Grant for NeurIPS 2023 2023
- **1st place in CLEVRER track at MVCS Challenge (ECCV 2022 Workshop)** 2022
- Vector Institute Research Grant 2022
- Outstanding Graduates (Beijing, Tsinghua University & Dept. of Automation) 2021
- **SenseTime Undergraduate Scholarship for AI Research** 2020
- Xiaomi Scholarship, Tsinghua University 2020
- Fang Chongzhi Scholarship, Tsinghua University 2019

- **Chinese National Scholarship** 2018
- Spark Program Membership, Tsinghua University
- Innovation Award of Science and Technology, Tsinghua University 2018-20
- Champion of the 20th Electronic Design Competition, Tsinghua University 2018

ACADEMIC SERVICES

Conference Reviewer/PC Member

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2022-24
- International Conference on Computer Vision (ICCV) 2023
- European Conference on Computer Vision (ECCV) 2022-24
- Conference on Neural Information Processing Systems (NeurIPS) 2022-23
- International Conference on Machine Learning (ICML) 2023-24
- International Conference on Learning Representations (ICLR) 2024-25
- Association for the Advancement of Artificial Intelligence (AAAI) 2023-24
- International Joint Conference on Artificial Intelligence (IJCAI) 2024
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2022
- IEEE International Conference on Robotics and Automation (ICRA) 2023-24

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)
- Transactions on Machine Learning Research (TMLR)
- International Symposium of Robotic Research (ISRR)
- IEEE Robotics and Automation Letters (RA-L)

Workshop Reviewer

- ICLR@OSC Workshop 2022

Seminar Co-Organizer

- Toronto AI in Robotics (AIR) Seminar 2022-23

MENTORING

Koichi Namekata May. 2024 – Present
Undergrad, University of Toronto
Project: Controllable video generation

Robert Ren Sept. 2023 – Jul. 2024
Undergrad, University of Toronto
Project: Personalized visual generation with diffusion models

Anastasiia Pedan May. 2023 – May. 2024
UofT CS Summer Program for Ukraine Students
Project: Object-centric reinforcement learning

Jasper Gerigk May. 2023 – May. 2024
Undergrad, University of Toronto
Project: Object-centric reinforcement learning
Next stop: MSc, University of Toronto

Qing Lyu May. 2023 – Nov. 2023
Undergrad, University of Toronto
Project: Event-based vision
Next stop: Data Scientist, Royal Bank of Canada

Xudong Liu Oct. 2022 – Nov. 2023
MScAC, University of Toronto
Project: Event-based vision
Next stop: Research Engineer, ByteDance Vancouver

Jingyu Hu Oct. 2022 – May. 2023
Undergrad, University of Toronto
Project: Object-centric diffusion model

Wuyue Lu Oct. 2022 – May. 2023
Undergrad, University of Toronto
Project: Object-centric diffusion model
Next stop: Master, Simon Fraser University

Jiaqi Xi Sept. 2021 – May. 2022
Undergrad, Peking University
Project: Object-centric dynamics model
Next stop: Master, Columbia University