

WEI YU

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EDUCATION

University of Toronto, Toronto

Ph.D. in Computer Science

Supervisor: Animesh Garg and Steve Easterbrook

August 2018 - Present

GPA: 4.00/4.00

Harvard University, Cambridge

Master of Science

Statistics, Computational Biology and Quantitative Genetics

August 2015 - May 2017

GPA: 3.90/4.00

Nanjing University, Nanjing

Bachelor of Science. Neuroscience

Sep 2011 - June 2015

GPA: 3.93/4.00

RESEARCH OVERVIEW

My research draws heavily on the Bayesian Brain Theory in cognitive science. This theory suggests that intelligent agents internalize the rules governing their environment through constantly predicting their incoming sensory signals, and then leverage this understanding as essential prior for interaction and planning. Visual information stands out as the most fundamental and critical signal in this process. Accordingly, my work centers on controllable video generation and its downstream applications as a world model, with a key focus on equipping pretrained models to grasp 3D world dynamics and autonomously explore with imagination.

EXPERIENCE

People, AI and Robotics Group, University of Toronto

Graduate Research Assistant

April 2020 - Present

Mentor: Dr. Animesh Garg

Sustainability Informatics Lab, University of Toronto

Graduate Research Assistant

Aug 2018 - Present

Mentor: Dr. Steve Easterbrook

Vector Institute, Toronto

Student Researcher

April 2020 - Present

Snap Research, LA

Research Intern

May 2021 - Oct 2021

Mentor: Dr. Sergey Tulyakov

NVIDIA Toronto AI Lab, Toronto

Research Intern

May 2019 - Aug 2019

Mentor: Dr. Sanja Fidler

Cox Lab, Harvard University

Research Assistant

Jan 2017 - May 2018

Mentor: Dr. David Cox

CyLab, CMU ECE

Research Assistant

May 2016 - Sep 2016

Mentor: Dr. Marios Savvides

PUBLICATIONS & MANUSCRIPTS

1. EgoSim: Egocentric Exploration in Virtual Worlds with Multi-modal Conditioning

Wei Yu, Songheng Yin, Steve Easterbrook, Animesh Garg.

ICLR 2025; ICML 1st CVG workshop (oral); Project Page.

2. **Modular action concept grounding in semantic video prediction**

Wei Yu, Wenxin Chen, Songheng Yin, Steve Easterbrook, Animesh Garg. CVPR 2022.

3. **Efficient and information-preserving future frame prediction and beyond**

Wei Yu, Yichao Lu, Steve Easterbrook, Sanja Fidler. ICLR 2020.

4. **CrevNet: Conditionally Reversible Video Prediction**

Wei Yu, Yichao Lu, Steve Easterbrook, Sanja Fidler.

3rd place in Traffic4Cast Challenge, NeurIPS.

5. **Application of deep learning to estimate atmospheric gravity wave parameters in reanalysis data sets**

Daisuke Matsuoka, Shingo Watanabe, Kaoru Sato, Sho Kawazoe, Wei Yu, Steve Easterbrook. Geophysical Research Letters

6. **Recovering the parameters underlying the Lorenz-96 chaotic dynamics**

Soukayna Mouatadid, Pierre Gentine, Wei Yu, Steve Easterbrook. ICML 2019 workshop on climate change

7. **See, plan, predict: Language-guided cognitive planning with video prediction**

Maria Attarian, Advaya Gupta, Ziyi Zhou, Wei Yu, Igor Gilitschenski, Animesh Garg.

HONORS & AWARDS

- Outstanding Paper Award at ICML Workshop on Controllable Video Generation
- 3rd place in Traffic4cast Challenge (NeurIPS Workshop)
- Vector Institute Research Grant
- University of Toronto Travel Grant for CVPR and ICLR

ACADEMIC SERVICE

Conference Reviewer:

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|---|---------|
| • Conference on Neural Information Processing Systems (NeurIPS) | 2022-24 |
| • International Conference on Learning Representations (ICLR) | 2021-24 |
| • International Conference on Machine Learning (ICML) | 2022-24 |
| • Association for the Advancement of Artificial Intelligence (AAAI) | 2024 |
| • IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) | 2021-25 |
| • European Conference on Computer Vision (ECCV) | 2022-24 |
| • International Conference on Computer Vision (ICCV) | 2023 |