WEI YU

40 St George Street, Toronto, Ontario, M5S 2E4
6175100914 ⋄ gnosis@cs.toronto.edu

EDUCATION

University of Toronto, Toronto *August 2018 - Present*
Ph.D. in Computer Science GPA: 4.00/4.00
Supervisor: Animesh Garg and Steve Easterbrook

Harvard University, Cambridge *August 2015 - May 2017*
Master of Science
Statistics, Computational Biology and Quantitative Genetics GPA: 3.90/4.00

Nanjing University, Nanjing *Sep 2011 - June 2015*
Bachelor of Science. Neuroscience 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 *April 2020 - Present*
Graduate Research Assistant Mentor: Dr. Animesh Garg

Sustainability Informatics Lab, University of Toronto *Aug 2018 - Present*
Graduate Research Assistant Mentor: Dr. Steve Easterbrook

Vector Institute, Toronto *April 2020 - Present*
Student Researcher

Snap Research, LA *May 2021 - Oct 2021*
Reseaerch Intern Mentor: Dr. Sergey Tulyakov

NVIDIA Toronto AI Lab, Toronto *May 2019 - Aug 2019*
Reseaerch Intern Mentor: Dr. Sanja Fidler

Cox Lab, Harvard University *Jan 2017 - May 2018*
Research Assistant Mentor: Dr. David Cox

CyLab, CMU ECE *May 2016 - Sep 2016*
Research Assistant Mentor: Dr. Marios Savvides

PUBLICATIONS & MANUSCRIPTS

1. **EgoPlay: Transforming Video Generative Pretraining into Interactive Game Engines for Practical World Model**

   Wei Yu, Jonah Chen, Songheng Yin, Steve Easterbrook, Animesh Garg. Under review for CVPR 2025.

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

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

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

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

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

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

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

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

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

   3rd place in Traffic4Cast Challenge, NeurIPS.

6. **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

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

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

8. **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:

- 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