Keaton Kraiger

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Education

Pennsylvania State University, PhD in Computer Science Engineering — Jan 2021 – Expected 2026

- Computer vision, multimodal learning, and learning human dynamics from video
- Advisors: Dr. Yanxi Liu and Dr. Robert T. Collins

Portland State University, BS in Computer Science (Magna Cum Laude) — Aug 2016 – June 2020

- Advisor: Dr. Dan Hammerstrom

Research Interests

I am broadly interested in machine learning and its applications in computer vision, graphics, and reinforcement learning. My work primarily focuses on self-supervised, multimodal learning in the video and image domain. My current research involves learning dynamics from human pose and zero-shot repetition and recurrence detection in videos and images.

Research Experiene

Research Assistant, Laboratory for Perception, Action, and Cognition (LPAC) — Jan 2021 – Present
Dr. Yanxi Liu and Dr. Robert Collins, Pennsylvania State University

- Estimated human stability from multimodal data (video, motion capture, and foot pressure)
- Collected, cleaned, and released motion capture, video, and foot pressure dataset of over 30k frames
- Performed multimodal action recognition and established classification dataset and benchmark
- Developed class-agnostic object detection method and its downstream application in enhancing captions

Undergraduate Research Assistant, Biologically-Inspired Computing Lab (BICL) — Dec 2018 – Jan 2020
Dr. Dan Hammerstrom, Portland State University

- Develop biologically-inspired algorithms to perform object detection
- Implemented brain-inspired algorithms to detect objects with position and scale invariance
- Process image datasets with grid cell model to aid in object detection and image classification
- Compare different image classifier performances, specifically convolutional neural networks and capsule networks when integrated with the grid cell model

Undergraduate Mentee, Undergraduate Research & Mentoring Program — Nov. 2018 – May 2019
College of Engineering and Computer Science, Portland State University

- Paired with faculty mentor to conduct funded research during the winter and spring term
- Attended program workshops on developing abstracts, research proposals, research questions, research methods, and means of communicating research findings
- Gained a foundation of computer science research by reviewing scholarly articles and relevant work being conducted

Publications

Vision to Dynamics: Estimating Foot Pressure from Spatial-Temporal Data — Under review
Keaton Kraiger, Yuan Gao, Jeff Koumba, Yanxi Liu, Robert T. Collins

Action Recognition with Novel Modalities — Under review
Keaton Kraiger, Addison Petro, Yuan Gao, Jeff Koumba, Yanxi Liu, Robert T. Collins

Novel 3D Scene Understanding Applications From Recurrence in a Single Image — Aug 2023
Shimian Zhang, Skanda Bhara, **Keaton Kraiger**, Yashasvi Asthana, Hong Zhang, Robert T. Collins, Yanxi Liu
Preprint

Work Experience

Head Teaching Assistant, Pennsylvania State University – State College, PA Aug 2021 – Dec 2023

- Head TA for Vision and Language, Computer Vision I & II, and Machine Learning
- Designed and implemented course projects focused on vision, deep learning, and reinforcement learning

Technical Course Specialist, Portland State – Portland, OR June 2019 – June 2020

- Led homework recitation sessions on undergraduate programming assignments and algorithm development
- Provide feedback and grades on programming and written assignments

Presentations and Posters

Vision to Dynamics April 2024

Keaton Kraiger, Yuan Gao, Jeff Koumba, Yanxi Liu, Robert T. Collins

NYC Vision Day 2024 | Poster

Humanoid Robots (Real and Simulated) February 2024

Yuan Gao, Jeff Koumba, **Keaton Kraiger**

Pittsburgh Robotics Network Discovery Day 2023 | Poster

The Applications of Grid Cells in Computer Vision, April 2019

Keaton Kraiger, Dan Hammerstrom

Portland State University Student Research Symposium | Poster

Additional Experience And Awards

Undergraduate Research & Mentoring Program (URMP)

- Selected to participate in the URMP at Portland State, receiving funding to conduct research with a faculty mentor and receive training on conducting research

Outstanding Teaching Assistant Award

- Recognized by the CSE college for Vision and Language Spring 2023 TA

Conference Reviewer

- Served as a reviewer for multiple years of WACV, ECCV, and CVPR