Keaton Kraiger

keatonkraiger@gmail.com | https://keatonkraiger.github.io | github.com/keatonkraiger
linkedin.com/in/keaton-kraiger

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

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- Designed and deployed a multimodal data collection system integrating ROS2-based RGB-D camera arrays, Meta Project Aria smart glasses, and insole pressure sensors
- 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 60k 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

Estimating Foot Pressure and Stability from Visual Input — To appear, Nov. 2025

Keaton Kraiger, Jingjing Li, Skanda Bharadwaj, Jesse Scott, Yanxi Liu, Robert T. Collins

BMVC 2025 (To appear)

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 Sep. 2017 – 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

Learn From Human Eyes: Zero-Shot Recurring Pattern Detection on a Multi-Perception Benchmark May 2025

Shimian Zhang, **Keaton Kraiger**, Skanda Bharadwaj, Robert Collins, Yanxi Liu

Symmetry 2025 Abstract Track | Slides

Best Oral Presentation Award

Vision to Dynamics February 2025

Keaton Kraiger, Skanda Bharadwaj, Yanxi Liu, Robert T. Collins

NYC Vision Day 2025 | Poster

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) Feb. 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