Pouyan Navard

Work Authorization: F-1 OPT, valid through 08/25/2029

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About Me

PhD hacker turning pixels into intelligence—2D/3D generative AI, CVPR-grade diffusion & 3D vision. PhD wraps May 2025, ready to start June 2025. Actively seeking full-time AI/ML roles where cutting-edge research ships to production.

Education

PhD	**The Ohio State University (OSU)**, Computer Science	Feb 2021 – May 2025

- Focus: computer vision
- GPA: 3.85

MSc	**The Ohio State University (OSU)**, Computer Science	Sept 2021 – Dec 2023

- Non-Thesis degree obtained through my PhD, GPA: 3.75

BSc	**University of Isfahan**, Computer Vision	Sept 2014 – Sept 2018

- Thesis: 3D Reconstruction using Structure from Motion
- GPA: 3.60

Publications

A 3D Self-supervised Video Transformer for 3D Echo Ultrasound Images
Pouyan Navard, Sirikar Adhikari, Alper Yilmaz
The Journal of the American Medical Association

Under preparation
July 2025

A Benchmark for 3D Eye Ultrasound Analysis
Pouyan Navard, Yasemin Ozkut, Sirikar Adhikari, Alper Yilmaz
Nature Scientific Data

Under preparation
June 2025

KnobGen: Controlling the Sophistication of Artwork in Sketch-Based Diffusion Models
Pouyan Navard, Amin Karimi Monsefi, Mengxi Zhou, Wei-Lun Chao, Alper Yilmaz, Rajiv Ramnath
CVPR 2025 - AI for Creative Visual Content Generation Editing and Understanding (CVEU) Workshop

March 2025
Nashville, USA

SegFormer3D: an Efficient Transformer for 3D Medical Image Segmentation
Pouyan Navard, Shehan Perera, Alper Yilmaz
CVPR 2024 - Workshop on Domain adaptation, Explainability, Fairness in AI for Medical Image Analysis

Feb 2024
Seattle, USA

A Probabilistic-based Drift Correction Module for Visual Inertial SLAMs
Pouyan Navard, Alper Yilmaz
The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences

Oct 2024
Las Vegas, USA

Assessing the effects of georeferencing error in a vertical comparison study of GDEMs
Masoud Babadi, Saeed Nadi, Pouyan Navard, Mohammad Moein Sheikholeslami, Mohammad Samiei, Vahid Sadeghi
International Journal of Remote Sensing

June 2021

Experience

Path Robotics Inc., Computer Vision Engineer

- Photorealistic image generation of 3D objects using 3D diffusion model

Columbus, OH
Nov 2024 - April 2025

- Conditional image generation (text, material, texture map)
- Active learning on out-of-distribution samples
- World model for autonomous robotics

Photogrammetric Computer Vision Lab (PCVLab), Graduate Research Assistant Columbus, OH
Feb 2021 – May 2025
- 3D medical image understanding (segmentation, classification)
- 3D image probabilistic distributional reasoning & representation learning
- 3D image self-supervised training

Center for Automotive Research, Simultaneous Localization and Mapping (SLAM) team lead Columbus, OH
Oct 2022- May 2023
- Leading the Ohio State University's SLAM team at General Motors SAE Autodrive Challenge
- Engineered a SLAM pipeline optimized for narrow FOV LiDARs
- Robust localization and mapping in geometrically constrained environments.

Projects

Fine-grained Material Control for Diffusion-based Image Generation Path Robotics Inc
- Introduced a *three stage* method for controlling the material during image generation:
- First stage: generate a provisional image with uncontrolled material with text-prompt
- Second stage: generate material hint given the provisional image and target material
- Third stage: using text-material conditioning using ControlNet to generate the foreground object
- Reduced the cost of data collection.

Deep-Neural World Model for Autonomous Robots. Path Robotics Inc
- Developed end-to-end ML-ops pipeline—automated data processing, PyTorch-Lightning training and Hydra configuration.
- **3x** faster experimentation with the devised streamlined pipeline.
- Muti-modal state representation for robot-learning using Graph Neural Network.

3D Ultrasound Image Understanding. PCVLab
- 3D ultrasound medical image representation learning robust to extreme noise (motion blur, diffuse reverbation etc)
- Foundational model for multi-modal ultrasound data, ocular (eye) and echocardiogram (heart) 3D image sequence
- Achieved expert-level performance with sensitivity of **98%** percent in detecting the class of interest

Visual SLAM in GPS-Denied and Low-Texture Environments. PCVLab
- Devised Multivariate Gaussian based probabilistic module for visual inertial navigation methods such as VINS-MONO
- software engineering computer vision pipeline into Augmented Reality (AR) system.

Awards and Honors

- Robert E. Altenhofen Memorial Scholarship Award ☑ ISPRS, 2022
- Graduate Student Travel Awards OSU, 2025

Services

Invited Reviewer: CVPR, ECCV, ICCV, ICLR, AVSS, ACCV, SIBGRAPI 2023-2025
Invited Talk: Intro to Diffusion Probabilistic Models OSU, 2025
Co-mentorship: Co-mentored along my advisor and collaborated with and lead junior PhD students PCVLab, 2025

Distributed Parallel Computing: Streamline large scale high performance (multi-gpu) pipeline and configs PCVLab, 2024-2025

Technologies

Technologies: PyTorch, GenAI, TensorFlow, Numpy, Scipy, Hydra, MLOps, Blender, VLM, Diffusion Model

Languages: C++, Python