

# Pouyan Navard

📍 Columbus, OH    ✉ boreshnavard.1@osu.edu    ☎ 380 710 3895    🔗 <https://bnavard.github.io/>    in pouyan-boreshnavard

## About Me

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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

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- PhD    The Ohio State University (OSU), Computer Science** Feb 2021 – May 2025
- Focus: computer vision
  - GPA: 3.85
- BSc    University of Isfahan, Photogrammetric Computer Vision** Sept 2014 – Sept 2018
- Thesis: 3D Reconstruction using Structure from Motion
  - GPA: 3.60

## Publications

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- KnobGen: Controlling the Sophistication of Artwork in Sketch-Based Diffusion Models** March 2025  
Nashville, USA  
[Pouyan Navard](#), Amin Karimi Monsefi, Mengxi Zhou, Wei-Lun Chao, Alper Yilmaz, Rajiv Ramnath  
CVPR - AI for Creative Visual Content Generation Editing and Understanding (CVEU) Workshop
- SegFormer3D: an Efficient Transformer for 3D Medical Image Segmentation** Feb 2025  
Seattle, USA  
[Pouyan Navard](#), Shehan Perera, Alper Yilmaz  
CVPR - Workshop on Domain adaptation, Explainability, Fairness in AI for Medical Image Analysis
- A Probabilistic-based Drift Correction Module for Visual Inertial SLAMs** Oct 2024  
Las Vegas, USA  
[Pouyan Navard](#), Alper Yilmaz  
The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences
- Assessing the effects of georeferencing error in a vertical comparison study of GDEMs** June 2021  
Masoud Babadi, Saeed Nadi, [Pouyan Navard](#), Mohammad Moein Sheikholeslami, Mohammad Samiei, Vahid Sadeghi  
International Journal of Remote Sensing

## Experience

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- Path Robotics Inc., Computer Vision Research Scientist Intern** Columbus, OH  
Nov 2024 - Present
- Photorealistic image generation of 3D objects using 3D diffusion model
  - 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

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### 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.
- Multi-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 reverberation 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

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- [Robert E. Altenhofen Memorial Scholarship Award](#) 
- Graduate Student Travel Awards

ISPRS, 2022

OSU, 2025

## Services

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**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

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

**Languages:** C++, Python