# Negar Nejatishahidin, Ph.D.

571-585-8143 • negarnejatiuni@gmail.com • N-NEJATISHAHIDIN.github.io
negar-nejati-ph-d-65684182

## Professional Summary

AI Research Engineer with a Ph.D. in Computer Science (Computer Vision & Deep Learning) and 6+ years of experience developing and scaling deep learning architectures and generative models. Skilled in model training, large-scale synthetic data generation, and safety-aware evaluation for Vision-Language Models (VLMs), Large Language Models (LLMs), and 3D vision. Extensive research in 3D scene understanding and multimodal perception. Passionate about transforming research innovations into robust, high-impact AI systems.

## Professional Experience

**HP Inc.**

*Senior Computer Vision Engineer* *Dec 2024 – Present*

- Research engineer for HP AI Companion-V2, a generative AI assistant integrated into HP AI PCs.
- Fine-tuned and deployed VLMs, SLMs, and LLMs using PEFT, RLHF (Reinforcement Learning with Human Feedback), DPO, and distillation with quantization for edge inference; improved performance by 26% on internal benchmarks.
- Built novel agentic GenAI-based evaluation frameworks leveraging chain-of-thought reasoning and LLMs as judges to benchmark LLMs and VLMs on reasoning performance and scalability.
- Designed synthetic data pipelines with novel recursive safety checks and generative augmentation, transforming low-quality data into high-fidelity reusable datasets across multiple teams.
- Research advisor for uncertainty-aware 3D room layout recovery pipeline from a single RGB image using Defusion and Gaussian Splash modules for feature refinement and probabilistic estimation.

**Humane**

*Computer Vision Research Intern* *May 2023 – Aug 2023*

- Enhanced on-device hand-tracking accuracy for the Humane AI Pin using semi-supervised learning on unlabeled datasets, improving internal accuracy by 13%.
- Developed a cycle-accuracy metric for 3D hand pose evaluation in semi-supervised training, improving model calibration and geometric consistency. Built automated evaluation and annotation pipelines, enabling scalable and repeatable benchmarking cycles for 3D tracking and reconstruction models.
- Automated dataset creation and annotation pipelines, enabling scalable, repeatable evaluation cycles.

**Zillow Group**

*Computer Vision Research Intern* *May 2022 – Dec 2022*

- Developed the first end-to-end architecture for global camera localization and layout estimation with model parallelism, achieving superior accuracy to SOTA baselines.
- Co-authored a Best Paper (CVPR OmniCV 2023) and a U.S. Patent (18/114,951) based on this research.
- Collaborated with Dr. Sing Bing Kang on scalable 3D scene understanding and deployment frameworks.

## Education

**George Mason University**

*Ph.D., Computer Science (Computer Vision & Deep Learning)* *2019 – 2025*

GPA: 3.8/4.0

Thesis: Multi-Modal Scene Understanding (Advisor: Dr. Jana Kosecka)

## Technical Skills

**Languages**: Python, C, C#, C++, Java, MATLAB, SQL

**Frameworks**: PyTorch, TensorFlow, Keras, Hugging Face, PyTorch3D, ONNX, OpenVINO, LangChain, FastAPI

**Systems**: Distributed Computing, Data/Model Parallelism, GPU Acceleration, Docker, Kubernetes, AWS, GCP, Linux, Git, REST APIs

**Vision/3D**: OpenCV, Open3D, COLMAP, OpenDroneMap, OpenSfM, PyTorch3D, SLAM, Structure-from-Motion,

Localization

**ML Models**: Transformers, CNNs, RNNs, GNNs; GPT-OSS, Phi, Gemma, Llama, Qwen, Mistral, LLaVA, CLIP, ALIGN

**Detection/Segm.**: DINO, DETIC, DETER, Grounding DINO, SAM (Segment Anything Model)

**Generative**: Stable Diffusion, Diffusion Models, NeRFs, Gaussian Splatting

**Techniques**: Distillation, Quantization, RLHF, DPO, PEFT, Pretraining, Finetuning, Few-Shot, Meta-Learning, Transfer Learning

**Learning Methods**: Supervised, Unsupervised & Self-Supervised, Contrastive & Representation Learning, Domain Adaptation

## Publications

**CVPR 2026 (to submit)**: Uncertainty-Aware Open-Vocabulary Zero-Shot 3D Semantic Segmentation in Unstructured Outdoor Scenes. N. Nejatishahidin, J. Kosecka.

**CVPRW 2023**: Graph-CoVis: GNN-Based Multi-View Panorama Global Pose Estimation *(Best Paper)*. N. Nejatishahidin, Zillow Group. Paper

**ICRA 2024 WS / ICRA 2025 (under review)**: Structured Spatial Reasoning with Open-Vocabulary Object Detectors. N. Nejatishahidin, J. Kosecka.

**IROS 2022**: Object Pose Estimation Using Mid-Level Visual Representations. N. Nejatishahidin, P. Fayyazsanavi, J. Kosecka.

**WACV 2024 WS**: Fingerspelling PoseNet: Pose-Based Transformer Models for ASL Translation. P. Fayyazsanavi, N. Nejatishahidin, J. Kosecka.

## Patent

**U.S. Patent 18/114,951**: Automated Inter-Image Analysis of Multiple Building Images for Building Information Determination. W.A. Hutchcroft, Y. Li, M. Narayana, N. Nejatishahidin. Link

## Selected Projects

**2024 – 2025**: Multi-Modal 3D Scene Semantic Segmentation — Zero-shot 3D segmentation combining 2D multimodal predictions with the help of SFM via uncertainty-weighted fusion; expanded label coverage from 81 classes to open-vocabulary.

**2023 – 2024**: Spatial Reasoning Using 3D Geometric Priors — Bench-marked Stable Diffusion, DALL·E, LLaVA, Grounding DINO for spatial reasoning; achieved +40% accuracy gain over LLaVA-Next with 3D-aware features; developed auto-labeling pipeline for internet-scale data.

**2022 – 2023**: Camera Localization — Extend pairwise panorama pose estimation to support an open number of images (limited only by hardware memory), with absolute improvements in rotation and scene layout accuracy.

**2020 – 2021**: Object Pose Estimation — Mid-level visual features (normals, reshading, depth) improved pose accuracy by 35% using only 25% training data.

**2021 – 2022**: Point Cloud Completion — Transformer encoder with PointNet++ positional embeddings; reduced generation error by 3%.

## Additional Links

Personal Website: N-NEJATISHAHIDIN.github.io | YouTube Demos: Demo 1, Demo 2