

KRISHI ATTRI

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EDUCATION

University of Central Florida


Ph.D., Mechanical Engineering — Post Master's Track

ORCGS Doctoral Fellow | REAL Lab (Advisor: Prof. Hwan Choi)

Seoul National University

M.S., Mechanical Engineering | GSFS Scholar | Soft Robotics & Bionics Laboratory

Villanova University

B.S., Mechanical Engineering | Minor in Mechatronics | Control & Dynamics  [Diploma](#)

Orlando, FL, USA

Aug 2026 (Incoming)

Seoul, South Korea

Sept 2024 – Aug 2026


Villanova, PA, USA

Aug 2020 – May 2024

EXPERIENCE

Graduate Research Student


Soft Robotics & Bionics Laboratory, Seoul National University | Seoul, South Korea

- **Humanoid Robot Project — “Alchemist” Project (MOTIE, Korea):** Contributing to Phase 2 (2024–2026) of a national humanoid-robot R&D program; integrating visuo-tactile SLAM and dexterous in-hand manipulation modules into the full-scale humanoid prototype.
- **GaussianFeels — Object-Centric Gaussian SLAM for Visuo-Tactile In-Hand Manipulation (M.S. Thesis, Advisor: Prof. Yong-Lae Park):** Built an online visuo-tactile reconstruction and 6-DoF pose-tracking system on an explicit object-centric 3D Gaussian Splatting map — fuses RGB-D vision, DIGIT tactile sensing, and hand proprioception with occlusion-aware supervision and a SLAM-loop SE(3) tracker, seeded by an image-to-3D shape prior. On FeelSight (14 objects), reached median ADD-S **0.83 mm** sim / **3.37 mm** real at $\approx 28 / \approx 23.5$ FPS — matching or beating model-free NeuralFeels at $\approx 7.6\times$ the frame rate with no supplied CAD model.
- **PoP-SLAM — Neural Point Cloud-Based SLAM:** Co-developed a dense visual SLAM system with a projection-first rendering strategy that eliminates nearest-neighbor searches via GPU-vectorised projection of ~ 15 000 neural points/frame. Achieved **best ATE RMSE of 0.75 cm** on TUM-RGBD (outperforming Point-SLAM, NICE-SLAM, ESLAM) at ~ 4 FPS. Introduced direct occlusion detection via multi-keyframe depth masking.  [Paper](#)

Sept 2024 – Aug 2026

Robotics & Mechatronics Researcher

Villanova University | Villanova, PA, USA

- Developed SLAM and visual odometry for quad-wheel robots in GNSS-denied environments via LiDAR–camera fusion, CNN-based feature extraction, and GPU point cloud processing.  [EOD robot](#)
- Built a full ROS-based navigation stack (path planning, obstacle avoidance) with Arduino/Raspberry Pi microcontrollers for real-time control; implemented probabilistic localisation (2D histogram + 1D Kalman filters) and real-time 3D mapping via computer vision.

Aug 2023 – May 2024

TECHNICAL SKILLS

SLAM & 3D Reconstruction: 3D Gaussian Splatting, Visuo-Tactile SLAM, Neural Point Cloud SLAM, SfM, RGB-D Reconstruction, Object-Centric Gaussian Mapping

Deep Learning & AI: PyTorch, CUDA (custom kernels), TensorFlow, Multimodal Learning, Differentiable Rendering, CNN / RNN / ViT

Generative 3D, Registration & AI Tooling: HiCache++ (DMD velocity-cache), diffusion/flow caching, Hunyuan3D, TRELIS, SAM 3D, DiT, gsplat, image-to-3D, splat registration (splatreg), MCP & formal-math tooling (mathlas), conformal prediction & certified planning (CERT-FLOW)

Robotics & Middleware: ROS, OpenCV, Open3D, Sensor Fusion, Real-time Inference, NVIDIA Omniverse




Hardware & Sensors: DIGIT Tactile Sensor, RGB/RGB-D Cameras, LiDAR, VectorNav IMU, RTK GPS, UR5e, Allegro Hand, Vicon/OptiTrack

Programming: Python, C/C++, CUDA, MATLAB, Arduino, \LaTeX , HTML

Tools & Systems: Linux (Ubuntu), SOLIDWORKS, Blender, Git/GitHub, KiCAD, Jupyter Notebooks



PROJECTS & ACHIEVEMENTS

Open-Source Research Software — HiCache++, splatreg, mathlas, CERT-FLOW  [PyPI](#) | Python, PyTorch, CUDA 2026

- **HiCache++** — a model-agnostic, training-free DMD/exponential velocity-cache (extends the prior HiCache/Hermite + TaylorSeer lines) that cuts redundant denoising compute while staying near-lossless. Benchmarked across **6 backbones** (Hunyuan3D-2/2.1, TRELIS v1/v2, Meta SAM 3D, Fast-SAM3D, DiT-XL/2) via a **14-repo adapter family** incl. a ComfyUI node. All four packages ship on PyPI with archived Zenodo DOIs: also **splatreg**  [PyPI](#) (SE(3)/Sim(3) registration + merge for 3DGS, 91.5% 3DMatch recall), **mathlas**  [PyPI](#) (12-tool airtight-math MCP server; 3.68M-doc theorem search, Lean-kernel proof checking, 0% false positives), and **CERT-FLOW**  [PyPI](#) (conformal route-cost certificates $LB \leq OPT \leq UB$ under drifting costs; coverage 0.95–1.00 incl. real METR-LA/PEMS-BAY traffic; solo-author preprint).

Computer Vision Object Detection App | Python, PyTorch, React, Flask

- Full-stack React/Flask app for real-time image/video object detection; implemented and benchmarked five models (Faster / Mask / Keypoint R-CNN, RetinaNet, SSDlite) in PyTorch and TensorFlow on COCO. Summer 2024

Capstone: Plant Lifting Device for 3D Imaging | FMC Corporation (Sponsored)  [Demo](#)  [Award](#)

- Led a multidisciplinary team from concept to working prototype (actuators, motion systems, wiring, waterproofing); **1st Place, Most Innovative Solution** at the capstone showcase. Aug 2023 – May 2024

CERTIFICATIONS & AWARDS

[NVIDIA Computer Vision Nanodegree](#) (Udacity, 2024) · K-MOOC Innovative Robot Technologies & Applications (SNU, 2024) · Robotics Specialisation (Coursera/UPenn, 2021)

GRE: Quant 166 (80th pctl), Verbal 153 · Dean's List: Fall 2020, Spring 2021 · Capstone 1st Place (2024) · ICE Competition 3rd Place (2020)