

NOLAN KNIGHT

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EDUCATION

- Northwestern University** - Evanston, IL **Expected December 2026**
Master of Science in Robotics
- Purdue University - Weldon School of Biomedical Engineering** - West Lafayette, IN **May 2025**
Master of Science in Biomedical Engineering
- Purdue School of Engineering & Technology** - Indianapolis, IN **May 2024**
Bachelor of Science in Biomedical Engineering
- Butler University** - Indianapolis, IN **May 2024**
Bachelor of Arts in Computer Science

WORK EXPERIENCE

- GM Diecron Inc., CAD/Automation Manufacturing (Contract)** - Remote **May 2025 - August 2025**
- Designed and modeled robotic machining layouts using Fusion 360 for aerospace manufacturing applications.
 - Modeled and assembled 3D designs and milling fixtures per engineering drawings and design constraints.
 - Produced fixture assemblies, orientation zones, and motion studies for robotic workflow automation.
- Zimmer Biomet, Development Engineering Co-Op** - Warsaw, IN **May 2024 - August 2024**
- Developed verification protocols and refined ROM reports to ensure compliance with ASTM / ISO Standards.
 - Improved anatomical knowledge through initiating involvement in sawbones, specimen harvesting, and cadaver labs.
- Roche Diagnostics, Logistics/Operations Intern** - Indianapolis, IN **May 2023 - August 2023**
- Analyzed data using PostgreSQL to improve warehouse functionality and streamline processes across warehouses.
 - Identified procedural and data inconsistencies, communicating findings to leadership to drive process improvements.
 - Increased weight check success rate from 75% to 90% through process optimization and key global data fixes.

PROJECTS

- Custom Quadruped Robot Design & Development - Rudy** **Winter 2026**
- Designed a 12-DOF quadruped with hip abduction for active balance, dynamic stability, and center-of-mass control.
 - Modeled and iterated the full mechanical system in CAD to validate joint range of motion and assembly fit.
 - Integrated Dynamixel actuators with TTL Bus, Ubuntu OS Raspberry Pi, and a proximity sensor into a unified system.
 - Built a ROS 2 C++ control stack with URDF modeling, joint position control, and kinematics for gait control.
- Franka Emika Panda Emika - Autonomous Color Sorting** **Fall 2025**
- Led a team in developing a Python-based ROS 2 motion package for the Franka Panda Emika robotic arm.
 - Gained experience with Linux and robotics control, enabling autonomous object identification and sorting.
 - Calibrated robot workspace and object drop zones using AprilTags with position-averaging techniques.
 - Implemented vision-based object detection and color differentiation using an Intel RealSense camera with OpenCV.
- CNN Efficiency in Mobile Architecture – GhostNet Reimplementation** **Spring 2025**
- Evaluated efficiency and resource usage of GhostNet, a lightweight CNN, on ImageNet and CIFAR-10 using Python.
 - Compared model accuracy, inference speed, and computational cost across channel attention in lightweight CNNs.
 - Optimized hyperparameters with PyTorch and TensorFlow, deploying top configurations to enhance model accuracy.

SKILLS

- **Programming & Version Control** - Python, C, C++, R, MATLAB, SQL, ROS 2, Linux, Unit Testing, Git
- **Software Libraries**: OpenCV, NumPy, PyTorch, TensorFlow
- **Perception & Mapping**: Computer Vision, LiDAR, SLAM
- **Robotics Control**: Motion/Path Planning, Position Control, Microcontrollers, Machine Learning
- **Simulation/Modeling**: CoppeliaSim, Gazebo, RViz, MATLAB-Simulink
- **Manufacturing & Design**: Fusion 360, Siemens NX, GD&T, 3D Printing, CNC Machining, soldering

Leadership & Involvement: Butler University Engineering Club (President, 2022), Sigma Nu (Housing Manager, 2021)