# DEREK GENG

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*A student researcher passionate about using machine learning to develop robotic perception and decision making. Experience with developing robotic systems with ROS and IssacSim, and implementing deep learning models in CV and robotics. Planning to pursue a Ph.D. in Computer Science and Robotics.*

## EDUCATION

**B.S.E in Computer Science**, Princeton University — Expected May 2026

Relevant Coursework: Foundations of Reinforcement Learning, Neural Networks, Computer Vision, Machine Learning and Pattern Recognition, Probability and Stochastic Systems, Algorithms and Data Structures, Computer Architecture, Linear Algebra. GPA: 3.8

## SKILLS

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|---|---|
| **Programming Languages** | C/C++, Java, Python, JavaScript, TypeScript, HTML, CSS |
| **Frameworks / Libraries** | ROS, OpenCV, PyTorch, TensorFlow, CUDA, Issac Sim, NumPy, SciPy |
| **Other** | Electronics (Arduino, Raspberry Pi, Franka-Emika Robotics), Linux, Git, CAD |

## EXPERIENCE

**Undergraduate Researcher at Princeton Vision & Learning Lab** — Apr 2023 - Present

- Developed an end-to-end automatic 6-DOF robotic grasping pipeline for unknown objects and environments. Tested on 100+ objects with a success rate of 40%. Built using PyTorch, OpenCV, and ROS.
- Captured pointcloud from RGB-D cameras into an machine learning model to propose object grasps.
- Used MoveIt! to implement octomap and RRTConnect motion planning w/ obstacle avoidance.
- Created novel grasp-labeling method, resulted in 10x reduction in object displacement and +15% accuracy.
- Developed an evaluation dataset for object rearrangement model using LiDAR and Stereo cameras.
- Attended weekly lab meetings lead by Jia Deng, presented and discussed current lab projects and CV research.

**Hack4Impact Technical Lead (Software Engineer/Full-Stack Developer)** — Sep 2022 - Present

- Produced full-stack app to manage end-to-end organization of book drives for the African Library Project. Includes features such as a forum, realtime chat, and leaderboard. Deploying for 100+ users.
- Coordinated with Project Manager to lead 7 developers. Built with MERN, Cloudinary, and GitHub.

## PROJECTS

**RAIDERLib** Team 75 FRC Control Systems library. Includes differential drive odometry, motion profiler, pure-pursuit controller, and Cubic Hermite Spline Generator GUI. Built using Java and Python.

**COVIDTracer** Created an app that used bluetooth signals to perform automatic contract tracing. Implemented Google Maps API to visualize contact tracing graph. Built using Flask, Bootstrap, and React Native.

**TryOnFull** Improved Google's TryOnDiffusion model to perform virtual try-on on both upper and lower body garments with DressCode dataset (10k+ images). Improved model performance by 33%. Built using PyTorch.

## PUBLICATIONS

Beining Han, Meenal Parakh, **Derek Geng**, Jack A. Defay, Gan Luyang, Jia Deng. *FetchBench: A Simulation Benchmark for Robot Fetching.* (Accepted CoRL 2024)

## AWARDS

**Notable Hackathon Awards** - 1st at Cohackathon, 2nd at MIT Blueprint, Best UI/UX at HackPrinceton

**RoboCup Junior: Rescue Maze** - 3rd place International, 1st place USA on Team Friends — May 2021

**USA Computing Olympiad** - Silver Level — Feb 2020