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RICK SHANOR

PROFILE

- **INNOVATION-DRIVEN ROBOTICIST & ENGINEER** with cross-industrial education and experience at the intersection of robotics, software engineering, and systems integration.
- **ENTERPRISING PRODUCT DEVELOPER** with demonstrated success in managing all stages of new product life cycle from prototype to production.

Core competencies in:

PRINCIPLES & PRACTICES:	Robotics • Software Engineering • Computer Vision • Simulation and Testing API Development • Manipulation and Grasping • Research and Development Systems Engineering and Integration • Manufacturing and Productization
TOOLS:	ROS • OpenCV • PCL • GRPC • Unity • TensorFlow • Android • Bazel • Git
LANGUAGES:	C++ • Python • Kotlin

EDUCATION

CARNEGIE MELLON UNIVERSITY • PITTSBURGH, PA

MS, ROBOTIC SYSTEMS DEVELOPMENT (4.12 GPA); TEACHING ASSISTANT DEC. 2016

- Perception Lead, 2016 Amazon Picking Challenge.
- Implemented a robotic perception and manipulation system to unload items from inventory shelves.
- Developed algorithm that used convolutional neural network to identify items in cluttered scenes.

BS, ROBOTICS & MECHANICAL ENGINEERING (DOUBLE MAJOR; 3.9 GPA) MAY 2015

HIGHLIGHTED PROFESSIONAL EXPERIENCE

BOSTON DYNAMICS • BOSTON, MA AND SAN FRANCISCO, CA

SENIOR STAFF ROBOTICS ENGINEER, SPOT JANUARY 2022 – PRESENT

ADVANCED ROBOTICS ENGINEER, SPOT JUNE 2018 – JANUARY 2022

- Integrating Spot's door opening behavior into the robot's navigation stack. Increasing autonomy by improving door detection using both classical computer vision and deep learning techniques.
- Led development for Spot's telemanipulation Android application, allowing operators to control the arm, open doors, manipulate objects, and turn levers and valves. (UX Highlights)
- Implemented core components for Spot's open source API and Python SDK, including the RobotCommand, RobotState, DoorCommand, and RayCast interfaces.
- Designed Unity simulation plugin for Spot's autonomy system that responded to API client commands and synthesized depth and image data.
- Built autonomous field camera calibration procedure to calibrate Spot's five stereo cameras. Procedure greatly reduced customer need to return robots for service.
- Wrote procedures, end-of-line tests, and calibration routines for building Spot robots in quantity at contract manufacturing facilities. Procedures ranged from actuator level checkouts to final kinematic calibration.

AMAZON ROBOTICS • BOSTON, MA

COMPUTER VISION SOFTWARE ENGINEER JANUARY 2017 - JUNE 2018

- Conceptualized perception software for robotic item singulation system; implemented novel grasping algorithms for both suction and finger end effectors to pick items from cluttered environments.
- Deployed new sensor architecture that abstracts vendor SDK specifics, isolates hardware resource management from other software components, and enables simple sensor data recording and playback.
- Built 3D scanning system to precisely calculate item size and pose when held by a robotic manipulator.

SPACEX • HAWTHORNE, CA

INTEGRATION AND TEST ENGINEERING INTERN, DRAGON SUMMER 2016