www.rickshanor.com
www.linkedin.com/in/rshanor
404.695.1322 • rickshanor@gmail.com

RICK **SHANOR**

ROBOTICS & MECHANICAL ENGINEER

PROFILE

INNOVATION-DRIVEN ENGINEER with cross-industrial education and experience at the intersection of robotics, design, and mechanical engineering. **ENTERPRISING PRODUCT DEVELOPER** with demonstrated success in managing all stages of new product life cycle from prototype to launch. **TRANSFORMATIVE LEADER & COLLABORATOR** whose confidence, perseverance, and vision promote success among colleagues, teammates, and the company, at-large. Core competencies in:

PRINCIPLES & PRACTICES:	ROBOTICS • MECHANICAL ENGINEERING • ENGINEERING CONSULTING • MECHATRONICS • TEAM LEADERSHIP
	SPACE EXPLORATION • MEDICAL DEVICES • TROUBLESHOOTING • PROTOTYPING • CAD • DATA ANALYSIS • R&D
	SYSTEMS ENGINEERING & INTEGRATION • VERIFICATION & VALIDATION • COLLABORATION • INDUSTRIAL ROBOTICS
	3D MODELING • PRODUCT ENGINEERING • PROGRAMMING • BUSINESS PLANS • PROJECT MANAGEMENT
TECHNOLOGY:	MATLAB • SOLIDWORKS • SIMULINK • SIMMECHANICS • AUTODESK INVENTOR • PTC CREO
	MICROSOFT EXCEL • VISUAL BASIC • EAGLE • MICROSOFT PROJECT • MICROSOFT VISIO • RASPBERRY PI • ARDUINO
LANGUAGES:	JAVA • PYTHON • C

EDUCATION

CARNEGIE MELLON UNIVERSITY • PITTSBURGH, PA
MS, ROBOTIC SYSTEM DEVELOPMENT EXPECTED 2016
BS, ROBOTICS & MECHANICAL ENGINEERING (DOUBLE MAJOR; 3.9 GPA) 2015

Selected Coursework:

- *Robotics Systems Engineering*
- *Computer Vision*
- *Dynamic Optimization*
- *Robotic Business*
- *Feedback Control Systems*

- *Robot Kinematics/Dynamics*
- *Biomechanics & Motor Control*
- *Manipulation, Mobility, & Control*
- *Soft Robots: Mechanics & Dynamics*
- *Applied Machine Learning*

Selected Projects:

2016 ICRA AMAZON PICKING CHALLENGE 2015-PRESENT
- Developing robotic perception and manipulation system to unload and box select items off inventory shelves.

SPOT: ROBOTIC DOG 2015
- Under the constraints of a $1500 budget, led mechanical and electrical design of robotic system that plays fetch, performs tricks, goes on walks, and recognizes voice commands.
- Implemented controllers on an AVR processor to command robot neck and jaw actuation based on camera, encoder, and limit switch feedback.
- Optimized fetching algorithm in Matlab simulation using Bluetooth triangulation and robot localization.

NASA-SPONSORED FLIGHT OPERATIONS RESEARCH PROJECT 2013-2015
- As Mechanical Lead, designed and constructed sensor package (gimbaled LIDAR, hi-resolution color camera, IMU, stereo camera) to create terrain maps of lunar caves.
- Collaborated with rocket flight provider, Masten, to meet size, mass, power, and vibration constraints.
- Deployed device over the Mojave Desert in March 2015 to validate data collection.
- Presenting at 2015 Planetary Caves Conference and 2016 AIAA Guidance, Navigation, & Control Conference.
- Recipient, 2014 Boeing Blue Skies Award for Creative Engineering Solutions – 1st Place.

SECURE BIKE RACK   2015
- Created innovative product to improve bicycle locking in urban environments.
- Modeled bike rack in Solidworks and optimized components through FEA studies.
- Designed security subsystem integrating motors, buttons, a keypad, and an Arduino.
- Recipient, Best Prototype among senior engineering class.

LAPTOP LOK   2013
- Invented, designed, manufactured, assembled, and programmed two iterations of USB alarms for laptop security.
- Programmed alarm behavior to sense disturbance based on accelerometer data and laptop connectivity.
- Configured security options allowing for reconfigurable and unique passwords.

ROBOT PROGRAM DEVELOPMENT   2012
- Collaborated with 2 teammates to develop autonomous robotic navigation software.
- Implemented path planning, trajectory following, map generation, localization, SLAM, object identification, and coordination algorithms (in Java).
- Placed 2nd in class final competition.

HIGHLIGHTED PROFESSIONAL EXPERIENCE

ASTROBOTIC TECHNOLOGY INC. • PITTSBURGH, PA
MECHANICAL DESIGN & ROBOTICS ENGINEERING INTERN   2013-PRESENT
- Designing and developing lunar lander for mission with focus on structures, system integration, terrain sensing, and payload deployment mechanisms.
- Tyrobot Mechanical Lead & Google Lunar X Prize Design, Summer 2013: Developed robotic system that clamps onto a strung cable, traverses cable, then lowers scientific payload to investigate lunar caves.
- Verified device in field by deploying two payloads: (1) a sensor package that generated 3D maps of PA coal mines and (2) a small subsurface rover.

KEY TECHNOLOGY • BALTIMORE, MD
MECHANICAL ENGINEERING INTERN   2015
- Provide medical device consultancy to drive development of alpha release of preferential brain cooling device with water delivery subsystem.
- Designed spray nozzles and tested performance in nasal cavity model and in pigs.
- Compared water pumping methods and integrated peristaltic pump into device.
- Prototyped disposable package to deliver air and water to patients.
- Supported medical device design, prototype, verification, and validation for 5 clients.

iROBOT CORPORATION • BEDFORD, MA
ROBOTIC ENGINEERING INTERN, HOME ROBOT UNIT   2014
- Performed research and development tasks for future robotic home vacuum products.
- Delivered air power test fixture to automatically measure air performance characteristics of vacuums in accordance with ASTM standards.
- Wrote complimentary Visual Basic tool to graphically compare test results across vacuum cleaners.

LEADERSHIP

BOOTH CHAIR/ INTRAMURAL SPORTS CHAIR/ MEMBER   SIGMA PHI EPSILON, CARNEGIE MELLON UNIVERSITY • 2011-2015

GRADUATE   NATIONAL OUTDOOR LEADERSHIP SCHOOL (NOLS) • 2011

EAGLE SCOUT   BOY SCOUTS OF AMERICA • 2009

FOUNDING MEMBER/ TEAM CAPTAIN   FIRST ROBOTICS TEAM, THE WESTMINSTER SCHOOLS (ATLANTA) • 2008-2011

EXTRACURRICULAR

FLY FISHING • **HIKING** • **SCUBA DIVING** • **BASKETBALL** • **INTERNATIONAL TRAVEL**