Kamal Carter

krcarter.github.io | in/kamalcarter
kamalrcarter@gmail.com | 215.554.8248

EDUCATION

CARNEGIE MELLON UNIV.

MS in Mechanical Engineering: Research & GEM Fellow
Cumulative GPA: 3.95 / 4.0
June 2021 | Pittsburgh, PA

BS in Mechanical Engineering
Minor in Robotics
GPA: 3.11 / 4.0
May 2019 | Pittsburgh, PA

CENTRAL HIGH SCHOOL

June 2015 | Philadelphia, PA

SKILLS

PROGRAMMING

Python • C++ • Arduino • Matlab
ROS • Gazebo • URDF • W ebots

MECHANICAL DESIGN

Solidworks • Inventor • Fusion 360
Ansys • PTC Creo • EAGLE CAD

FABRICATION EXPERTISE

Lathe • Mill • CNC Routing
3D Printing• Laser Cutting

COURSEWORK

Robotics Kinematics & Dynamics
Feedback Controls Systems
Linear Controls Systems
Electromechanical Systems Design
Sensors, Actuators, and Processors
Applied Finite Element Analysis
CAD and CAE Tools

REFERENCES

DR. AARON JOHNSON

Research Advisor
amj1@andrew.cmu.edu

DR. SARAH BERGBREITER

Research Advisor
sbergbre@andrew.cmu.edu

DR. MARK BEDILLION

Teaching Assistant Supervisor
mbedillion@cmu.edu

EXPERIENCE

ROBOMECHANICS LAB - CMU | Research Assistant

September 2019 - Present | Pittsburgh, PA

- Lead the design of a novel, small, 3D printed bipedal legged robot inspired by passive dynamic walking
- 3D modeling using Solidworks and Ansys for failure analysis
- Designed a custom PCB in EAGLECAD with the ATMEGA32u4 Chip
- Simulated robot using ROS and Gazebo to model complex robot walking behaviors
- Data collection with motion capture and computer vision software

TEACHING ASSISTANT | Carnegie Mellon Univ.

September 2019 – Present | Pittsbugh, CA

- 24-352 Dynamics Systems and Controls: Led the development of a remote learning project to teach undergraduate students controls
- 24-671 Electromechanical Systems Design - Advised graduate teams on system design and integration

DRAPER LAB | Intern - Mechanical Instrumentation Engineer

Summer 2018 | Cambridge, MA

- Worked on extremely accurate and precise guidance devices
- Focused on technical drawings, GD&T, and modelling in Creo Parametric and Solidworks
- Built large scale 3D printed designs and mockups

PROJECTS

BRACHIATING SWINGING MONKEY ROBOT | Spring 2020

Robot Design and Experimentation - Capstone
Designed electrical, mechanical, and control systems for an acrobatic robot. Robot was able to build up momentum to swing longer and father, and able to release it self to be able to launch.

MINI-BALLBOT | Spring 2019

Humanoids Capstone Project
Built a 445mm tall robot that can balance on a 3-inch ball. The completion of this project needed extensive knowledge of motor dynamics, feedback controls, and lightweight mechanism design.

COCKTAIL MAKER ROBOT | Fall 2018

Electromechanical System Design Capstone Project
Built a fully functional cocktail machine that shake, stir, and pour drinks.Worked on fluid flow, electronics control, and mechanical design of gantries.

ROBOTIC ARM - 5 DEGREES OF FREEDOM | Fall 2018

Robot Kinematics and Dynamics Capstone Project
Capstone project to program robotics trajectories in MATLAB. Built a controls pipeline for robot kinematics, transformations, and workspace navigation.

OUTDOOR MOBILE ROBOT (MOBOT) | Spring 2018

Robot Kinematics and Dynamics Capstone Project
Designed an outdoor line following robot that traverse through 255-foot-long course with decision points. Incorporated computer vision with feedback control for line following and PID.