

# Thomas Moriarty

(339)-223-9697

tojomcmo@gmail.com

tojomcmo.com

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## EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA  
Double major; BS in Mechanical and Ocean Engineering, BS in Music

*GPA: 4.6/5.0*  
*February 2015*

**Carnegie Mellon University**, Pittsburgh, PA (not completed)  
MS candidate in Mechanical Engineering – Robotics, Dynamics, Controls

*GPA: 4.0/4.0*  
*2020 - Leave of Absence*

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## TECHNICAL EXPERIENCE

### Independent projects

*2023-present*

- Building a library of trajectory optimization and control algorithms for personal development using JAX auto-diff, Mujoco, and various optimization tools
- Providing technical guidance to Tatum Robotics for future controls development in a robotic hand tactile ASL interface

### Found Energy *Engineering Consultant*

*2023*

- Provided engineering consulting support for a prototype Aluminum-based power reactor.
- Aided in designing fuel transport and reactor pneumatic systems.

### Indigo Technologies Inc. *Lead Systems Engineer – Director of Vehicle Controls*

*2021 - 2022*

- Led control architecture development for integrated power-train suspension systems and design of future Indigo motor-suspension interfaces.
- Created dynamic models of both vehicles and suspension-integrated motors for control algorithm development and simulation in CarSim/Simulink.
- Developed fundamental parameter interfaces between mechanical and control systems.
- Designed and implemented active roll, yaw, and ride control on vehicle for Indigo vehicles.

### Biorobotics Lab – CMU Robotics Institute *Student Researcher*

*2020*

- Studied optimal control theory and underactuated robotic control.
- Developed nonlinear and adaptive model predictive controllers and compared controller performances for simulated satellite rendezvous maneuvers.
- Developed dynamic models for high DoF swimming floating-base manipulators.

### Indigo Technologies Inc. *Mechanical Engineer*

*2015 – 2020*

- Led mechanical engineering on patented electromechanical active suspension systems, and designed custom suspensions for vehicle prototypes and test equipment.
- Developed novel active leaning systems and energy consumption models for narrow vehicles.
- Designed, analyzed and fabricated chassis structures for Indigo vehicles.
- Interfaced with external partners to provide technical insight for core company technologies.
- Managed workflow and provided technical guidance for new mechanical employees.
- Defined workflow for large-scale CAD assemblies across a 7+ person team, and managed project scope for team of 5 engineers over an outlook of 1+ years.

### Schlumberger REMS *Mechanical engineering intern*

*2014 Summer*

- Designed a retrofit hammer drill mechanism for horizontal well intervention
- Led project from concept design through fabrication orders and prototype testing plans
- Developed system models in MathCAD and ProCreo to produce a prototype design

**Marine Robotics Team** *Student researcher – MIT*

2011-2015

- Designed and fabricated the mechanical systems of a Chevron-funded autonomous underwater glider prototype for detection of dispersed oil in ocean environments
- Field-tested glider prototype in Ketchikan, Alaska and NAVSEA in Carderock, MD
- Led project developing an underwater ROV with wireless onboard communication

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## TEACHING EXPERIENCE

**MIT Engineering Systems Design Class** *Teaching Assistant – 2.014*

2014 – 2015

- Employed as a teaching assistant for a capstone mechanical engineering class, working on submerged autonomous power systems with Lincoln Labs and the Office of Naval Research.
- Collaborated on a project extending the range of REMUS 600 autonomous underwater vehicle; responsible for designing and fabricating structures containing chemically reactive materials.
- Provided guidance for group designing a 3-kiloWatt Aluminum fueled generator.

**I2Camps** *Short course instructor – Edgerton Center MIT*

2013 Summer

- Developed and taught a 2 week introductory engineering design camp module ages 11 - 14, iterating on the previous ASRA 2-week course with underwater ROV design

**Alaska Summer Research Academy** *Short course instructor*

2012 Summer

- Developed and taught a 2 week introductory engineering design camp module ages 15-18
- Class focused on fundamentals of design, the iterative process, and fabrication skills through building small underwater remotely operated vehicles

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## PATENTS

- 10,483,832 - Multi-bar linkage electric drive system
- US 20210283970 A1 - Multi-input, multi-output actuator and assemblies using same

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## RELEVANT SKILLS

**Machining:** Lathe, Mill, Router, TIG weld, Laser Cutter, Water Jet, Manual tools, GD&T-Y14.5

**Software:** SolidWorks, MathCAD, MATLAB-Simulink, Optimum-Kinematics, CarSim, Mujoco

**Programming Languages:** C/C++, Python

**Hobbies:** Music production/performance, photography, biking/running, technical side projects

**Github URL:** <https://github.com/tojomcmo>