Thomas Moriarty

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA   *GPA: 4.6/5.0*
Double major; BS in Mechanical and Ocean Engineering, BS in Music   *February 2015*

Carnegie Mellon University, Pittsburgh, PA (not completed)   *GPA: 4.0/4.0*
MS candidate in Mechanical Engineering – Robotics, Dynamics, Controls   *2020 - Leave of Absence*

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

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

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

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