

Charlie DeLorey

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Citizenship: USA

LinkedIn: [linkedin.com/in/charlie-delorey/](https://www.linkedin.com/in/charlie-delorey/)

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Research interests

Soft robotics, prosthetics, medical and wearable devices, human-machine interfaces

Education

Imperial College London

London, UK

MRes in Medical Robotics and Image Guided Intervention October 2020 – September 2021

Mentors: Drs. James Avery, Mark Runciman, Saina Akhond, George Mylonas. *First Class, Distinction (74.87%)*.

Tufts University

Medford, MA, USA

BS in Computer Science

September 2016 – May 2020

Mentor: Dr. Jivko Sinapov. *GPA: 3.31 / 4.0*.

Selected coursework

- Robotics: Medical Robotics, Minimally Invasive Surgery, Image Guided Intervention, Reinforcement Learning
- Computer Science: Programming Languages, Algorithms, Computational Physics
- Medical Devices: Engineering Design Process, Medical and Surgical Imaging

Selected projects

Sensing soft robot actuation using electrical impedance tomography

February

2021 – September 2021

Designed and fabricated soft robot actuator. Integrated EIT technique to sense shape change of robot by registering change of electrical paths in flexible saline solution chamber. Conducted data analysis and experimentation to assess validity of robot and sensor design.

Tools: Python, MATLAB, LabVIEW, Arduino, Inventor. [repository]

Fluorescence sensor for gut health monitoring

October 2020 – December 2020

Designed and fabricated wearable device to detect and quantify fluorescent contrast in patient bloodstream, to inform diagnosis of gut disorders. Simulated fluorescence emission and detection in biological tissue using Toast++ software package to determine optimal locations for light source and detector. *Tools: MATLAB, Arduino, Inventor/SolidWorks.*

3D-printed 5-fingered robot hand

September 2019 – May 2020

Designed, fabricated, and programmed anthropomorphic underactuated hand powered by an Arduino Uno. Controlled hand via serial connection to Ubuntu machine running a Robot Operating System (ROS) node. *Tools: Onshape, Arduino, ROS. [repository]*

Reinforcement learning with compliant gripper

September 2019 – December 2019

Developed successful learning agent to find optimal grip position of tennis ball using compliant gripper and UR5 robot arm. *Tools: NumPy, ROS, MoveIt.*

Publications

"Recent technological advances and challenges for the future landscape of minimally invasive surgery." Charles DeLorey, Joseph Davids, Hutan Ashrafian, Ara Darzi, et al. *Surgical Life, Journal of ASGBI*, , no. 59, pp.69-75, May 2021.

Research experience	Research Assistant, Department of Physics and Astronomy, Tufts University	
	Mentors: Dr. Timothy Atherton	May 2020 – September 2020
	Remodeled website for academic paper search engine using Python, Flask, MongoDB, and Javascript/HTML.	
	Research Assistant, Department of Computer Science, Tufts University	
	Mentors: Dr. Jivko Sinapov	May 2018 – May 2020
	<ul style="list-style-type: none"> • Projects 1 and 2: May 2019 - May 2020 <ul style="list-style-type: none"> – Wrote Python and ROS drivers for Universal Robot dual arm configuration. – Incorporated custom mesh visualization feature to human-robot interaction augmented reality project using ROS, Turtlebots hardware, and Unity game engine. • Project 3: May 2018 - August 2018 <ul style="list-style-type: none"> – Developed ROS control program for Turtlebot navigation between floors of computer science building. – Determined feasibility of Turtlebot multi-floor movement program. 	
Teaching experience	Teaching Assistant, Department of Computer Science, Tufts University	
	COMP 105 (Programming Languages)	September 2019 – May 2020
	<ul style="list-style-type: none"> • Aided course staff in teaching 100 undergraduate students. • Held weekly office hours to assist students with course material and assignments, including code debugging, calculational proofs, and key programming language concepts such as datatypes and type inference. 	
Skills	Programming	Software
	Proficient in: Python, MATLAB, C++. Familiar with: C, HTML, CSS.	Proficient in: Inventor, Onshape, Rhino 3d, MATLAB. Familiar with: ROS, LabVIEW, AutoCAD.
	Languages	
	French (limited working proficiency)	
Service and outreach	Academic Representative, Imperial College London	
	October 2020 – September 2021	
	Co-representative of MRes in Medical Robotics cohort to faculty in administrative and academic matters. Facilitated effective communication between the students and faculty.	
	Teacher, Rainstorm, Northeastern University	
	May 15-16, 2021	
	Taught two 50-minute sessions on medical technology, including current and novel techniques. Engaged students with interactive trivia quiz and open Q&A time to answer their questions.	
	Secretary, oSTEM chapter, Tufts University	
	September 2018 – May 2020	
	Maintained meeting notes, chapter email, Facebook page, and designed events for the Tufts student body. Corresponded with interested students and external bodies interested in collaborating with oSTEM.	
	Teacher, Splash, MIT	
	November 18-19, 2017	
	Taught two 110-minute sessions on science fiction, including the history of the genre and the cultural and philosophical themes presented in sci-fi literature and film.	

References available upon request.