MATTHEW L. CAVUTO

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EDUCATION

Imperial College London — **London, UK**
- Research Assistant in the Centre for Bio-Inspired Technology — March 2020 - Present
- Candidate for PhD in Electrical and Electronic Engineering — *(Expected)* January 2021
- MSc. in Biomedical Engineering (Neurotechnology Concentration) awarded with Distinction — October 2018

Massachusetts Institute of Technology (MIT) — **Cambridge, MA**
Bachelor of Science — June 2017
Major in Mechanical Engineering with a concentration in Biomechanics and Biomedical Devices — **GPA: 5.0/5.0**

EXPERIENCE

Lacewing – Portable Lab-on-a-Chip Rapid-Diagnostics Platform [protondx.com] — **London, UK**
Research Assistant/PhD Research – Dr. Pantelis Georgiou — December 2019 – Present
- Engineering microfluidic and sample-prep system for low-volume multiplexing on chip
- Conducting design-for-manufacturing (DFM) of entire platform and accelerating validation for use by NHS as rapid COVID-19 diagnostic test to combat the pandemic

Precision Surgical Tool — **London, UK**
Lead Engineer — January 2019 – Present
- Spearheading design of precision surgical tool handle system, adapted for cranial aneurysm clipping, and accompanying clips for improved accuracy, reliability, and safety (*patent pending*)
- Collaborating with distinguished international panel of surgeons for design and clinical validation

Empowering Next Generation Neural Interfaces (ENGINI) — **London, UK**
Research Assistant/PhD Research – Dr. Timothy Constandinou — January 2017 – Present
- Mechanically characterizing next generation semi-rigid cortical neural probe under chronic implantation conditions
- Engineering unique mm-scale modular probe structure and accompanying manufacturing process
- Designed novel surgical implantation device (*patented)* to minimize acute tissue damage and chronic foreign body response while preserving probe/electrode integrity

Need-a-Knee LLC: Low-Cost Transfemoral Rotator — **Cambridge, MA**
Co-Founder and Chief Technology Officer (CTO) — **Bengaluru and Jaipur, India**
- Spearheaded design of a low-cost transfemoral rotator for use in the developing world — September 2015 – Present
- Partnering with Mobility India and the Jaipur-Foot Organization, with pilot production and clinical testing underway

STAND: The Haiti Project — **Port-de-Paix, Haiti**
Engineering Consultant and Teaching Assistant — January 2017 – August 2017
- Worked with Haiti based volunteer medical clinic, designing and building custom orthotic and pediatric assistive devices for patients in country.

Proton Therapy Beam Energy Modulator — **Cambridge, MA**
Mechanical Design Lead – Prof. Alexander Slocum — September 2016 – Present
- Designing novel compact energy modulation device (patented) for use in proton beam imaging of cancerous tumors through collaboration with the Massachusetts General Hospital Francis H. Burr Proton Beam Therapy Center

MIT Global Engineering and Research Lab (GEAR Lab) — **Cambridge, MA**
Undergraduate Researcher and Teaching Assistant – Prof. Amos G. Winter — January 2016 – June 2017
- Investigating and prototyping new variable damping system for developing world focused prosthetic knee

Continuum Innovation — **Boston, MA**
Contracted Engineer — June 2016 – September 2017
- Team member on both medical device and consumer product development projects.

Technische Universität Berlin — **Berlin, Germany**
Assistive Technologies Researcher – Prof. Thomas Schauer — June 2015 – September 2015
- Headed IMU calibration and knee flexion/articulation device projects for stroke patient rehabilitation.

PATENTS

- Cavuto, M. L. Ekanayake, J., "Actuator Handle for Surgical Tools, and Improved Surgical Clips," Patent Application United Kingdom 2011106.8, Filed July 19, 2020.
- Cavuto, M. L., et al. "Apparatus and Method for Inserting Electrode Probes into Biological Tissue," Patent Application United Kingdom 1817838.4, Filed October 31, 2018.
- Cavuto, M. L., et al. "Modular Glaucoma Implant with Variable Flow," Patent Application United States 62520647, Filed June 16, 2017.
- Cavuto, M. L., et al. "Compact Proton Beam Energy Modulator," Patent Application United States 62482743, Filed April 7, 2017.
- Cavuto, M. L., Chun, M., "Transfemoral Rotator Using Push Button Spring Clips," Patent Application United States 62287969, Filed January 28, 2016.

PEER-REVIEWD PUBLICATIONS

- Aggarwal, N., Cavuto, M., Li, M., Rodman, N., Slocum, A., Jee, K., & Lu, H. (2020, 3 1). "Design of a compact proton beam energy modulator for imaging," Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 955, 163269.
- Cavuto, M. L., Constandinou, T.G., 2018, "Investigation of Insertion Method to Achieve Chronic Recording Stability of a Semi-Rigid Implantable Neural Probe," 9th International IEEE EMBS Conference on Neural Engineering 2019
- Ahmadi, N., Cavuto, M. L., Constandinou, T.G., et al., 2018, "Towards a Distributed, Chronically-Implantable Neural Interface," 9th International IEEE EMBS Conference on Neural Engineering 2019
- Cavuto, M. L., Chun, M., Kelsall, N., Zhou, M., Baranov, K., and Durgin, K., Winter, A. G., 2016, "Design of Mechanism and Preliminary Field Validation of Low-Cost Transfemoral Rotator for Use in the Developing World," Proc. 40th Mechanisms and Robotics Conference, ASME IDETC/CIE 2016, Paper IDETC2016-59913, Volume 5A, pp. 1–8.

SCHOLARSHIPS AND FELLOWSHIPS

Marshall Scholarship 2017 - 2019
International Scholarship, funded by the British Government, which sends American students to the UK for two years of graduate level study. Degrees being pursued: MSc in Biomedical Engineering at Imperial College London and MPhil in Engineering at University of Cambridge.

National Science Foundation (NSF) Graduate Research Fellowship 2017 - Present
Awarded three-year stipend and cost of graduate education fellowship for demonstrated potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise.

AWARDS AND DISTINCTIONS

Stella Bagrit Centenary Memorial Award October 2018
Awarded for the best departmental MSc. Thesis, taking into consideration student's potential for making a contribution to the field of Biomedical Engineering.

Ash Prize October 2018
Awarded for the Best Academic Performance in the MSc. In Biomedical Engineering program.

Luis de Florez Award May 2017
Demonstration of Outstanding Ingenuity and Creative Design in Engineering. Awarded for the design and validation of a Compact Proton Beam Energy Modulator. (patent pending)

Prince Prize for Innovation May 2017
Awarded for the most promising undergraduate patented technology.

Park Award May 2017
Awarded for academic achievement and outstanding performance in manufacturing and design.

2017 Award for Best New Medical Device May 2017
Awarded for novel design of a modular minimally invasive glaucoma implant. (patent pending)

MISTI Achievement Award April 2017
The MIT International Science and Technology Initiatives (MISTI) Achievement Award is presented annually to an MIT student or recent alumnus who has made a particularly noteworthy contribution to his or her host organization.

Sloan Healthcare Innovations Prize (SHIP) February 2017
Awarded runner-up prize for Low-Cost Transfemoral Rotator Design for the Developing World. Award given to promote innovation and entrepreneurship in the healthcare space.

Louis de Florez Award May 2016
Demonstration of Outstanding Ingenuity and Creative Design in Engineering. Awarded for design work on developing world focused prosthetic component. (patent pending)

2.007 Design and Manufacturing MacGyver Award May 2015
Award given to student for creative problem solving and invention.

Awarded DAAD RISE Fellowship March 2015
Gottfried Wilhelm Leibniz Universität Hannover. Declined in order to pursue independent project at Technische Universität Berlin

German Studies Excellence Award April 2014
Award given to student in department for exceptional reading, writing, and speaking development.