aMANDA SUTRISNO

# Summary

Second year PhD student with 3.5 years prior working experience as a research engineer. Expertise in theoretical modeling/simulation and automatic design for robotics.

# Education

## **Sep 2020 – present** Vanderbilt University Nashville, USA

### Doctor of Philosophy(PhD), Mechanical Engineering (CGPA: 3.7/4.0)

## **May 2013 – Sep 2016** SUTD Singapore, Singapore

### Bachelor of Engineering(BEng), EPD, General Engineering (CGPA: 3.5/4.0)

# Honors

## Publication: A. Sutrisno and D. J. Braun, “How to Run 50% faster without external energy”, Sci. Adv., (2020) was publicized in the newspaper *“The Guardian”* <https://www.theguardian.com/science/2020/mar/26/spring-heeled-concept-that-could-see-usain-bolt-rocket-to-50mph>

## Publication: C. Lee, A. Sutrisno, et. al., “Imaging nodal knots in momentum space through topolectrical circuits”, Nat. Commun., (2020), was selected for *Editor’s Research Highlights in condensed matter physics* in the journal Nature Communications.

# Skills & Expertise

**Theoretical Modelling/Simulation:** Solid mechanics, Partial Differential Equations, Finite Element Method, Nonlinear Optimization

**Programming:** C++, Python, html, CSS, Javascript, MATLAB

**Commercial Software:** Ansys Mechanical**,** Autodesk Fusion 360, Solidworks, Wordpress

# EMPLOYMENT

## **Feb 2020 – present** Vanderbilt University Nashville, TN

### Research Assistant/PhD Student

**Advanced Robotics and Control (ARC) Lab** (**PI: Professor David Braun**)

* Develops flexible, 3D-printable, “passive mechanisms”, devices to store and manipulate energy without requiring an internal power supply.
* Passive mechanisms find use in human augmentation applications such as building a battery-less leg exoskeleton to enable a human to run 50% faster or jump 3x higher.
* Develops automatic design algorithms for passive mechanisms, i.e. software to optimize the dimensions of a simulated structure(Ansys Mechanical) in order to obtain the structure with the lowest weight, smallest size, and highest energy stored.
* Webmaster for lab website(wordpress): <https://lab.vanderbilt.edu/arclab/>

**Jan 2019 – Jan 2020** SUTD Singapore

### Research Engineer

**Electron Photon Plasmonic and Plasma interaction (EPPPi)** Group. (**PI: Professor Ricky Ang**)

* Designed and constructed inductor/capacitor(LC) circuits to mimic material properties of topological quantum materials.
* Simulated AC impedance of electronic circuit with over 300 inductor/capacitor components in Python, subject to real world effects such as component value tolerance and parasitic resistance.
* Applied machine learning tools in python (Scikit learn) to optimize ideal capacitor values in simulated electronic circuit to give experimental results closest to theoretical prediction given real world effects.
* Webmaster for lab website(wordpress): <https://people.sutd.edu.sg/ricky_ang/>

**May 2017 – Jan 2019** SUTD Singapore

### Research Engineer

**Dynamics and Control Lab** (**PI: Assistant Professor David Braun**, now at Vanderbilt University, Advanced Robotics and Control Lab)

* Theoretical modeling of hypothetical wearable exoskeletons and interaction with the human body using spring/mass models.
* Analytically solved ordinary differential equations of spring/mass models to theorize new kinds of wearable exoskeletons to augment human athletic performance in top running speed and jump height, but require no external energy.

**Nov 2016 – May 2017**  Micron Technology Singapore

### Product Engineer (NAND Flash Memory)

* Responsibilities included diagnosing, characterizing, and providing solutions to defects in NAND flash memory chips affecting high-volume manufacturing yield.
* Discovered a chip defect affecting 10% of the manufacturing yield caused by a change in semiconductor doping between previous and current generation memory devices.
* Developed a model of the chip defect using semiconductor physics to show that the defect does not affect the long term reliability of the chip
* Appointed liaison between the manufacturing team in Singapore and the research and development team in the US/Italy. Communicated recent internal research papers on semiconductor physics to the engineering team.

# pUBLICATIONS

**A. Sutrisno** and D. J. Braun, “How to Run 50% Faster without External Energy”, *Science Advances*, 6(13), eaay1950, (2020).

C. H. Lee, **A. Sutrisno**, T. Hofmann, T. Helbig, Y. H. Liu, Y. S. Ang, L. K. Ang, X. Zhang, M. Greiter, and R. Thomale, “Imaging nodal knots in momentum space through topolectrical circuits”, *Nature Communications*, 11(1), 4385, (2020).

**A. Sutrisno** and D. J. Braun, “Enhancing Mobility with Quasi-passive Variable Stiffness Exoskeletons”, *IEEE Trans. Neural Syst. Rehabil. Eng.*, 27(3), 487-496, (2019).

H.F. Lau, **A. Sutrisno**, T. H. Chong, D. J. Braun, “Stiffness modulator: A novel actuator for human augmentation”, *IEEE Intl. Conf. Robot. Autom. (ICRA),* 7742-7748, (2018).