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/

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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).