Vinh Nguyen

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Education

UNIVERSITY OF WASHINGTON Seattle, WA

Ph.D. Program in Mechanical Engineering 2020 - Present

Advisor: Professor Corie L. Cobb
GPA: 3.95 / 4.00 | Relevant Coursework: Energy Materials & Devices, Colloidal Systems, Nanocomposites, Modern Manufacturing Processes, Advanced Composites Manufacturing, Thin Film Mechanics

HARVARD UNIVERSITY Cambridge, MA

B.S. in Mechanical Engineering, Minor in Computer Science 2013 – 2017

Thesis: *User Interface Design for 4DOF Robotically-Driven Flexible Instruments*
Advisor: Professor Robert D. Howe
GPA: 3.70/4.00, *Cum Laude with High Honors*

Professional and Research Experience

UNIVERSITY OF WASHINGTON INTEGRATED FABRICATION LABORATORY Seattle, WA

Ph.D. Graduate Researcher Sept 2020 – Present

- Design custom multi-material additive manufacturing platforms for in-situ printing of Li-ion batteries, electronics, and wearable devices
- Develop toolpath generation software with C# to enable multi-axis, 3D conformal printing and other nonconventional printing techniques
- Formulate specialized inks for printing batteries with 3D architectures for improved energy and power density
- Optimize battery designs by analyzing electrochemical and rheological data of materials with Python
- Investigate material and processing compatibilities for integrating printed batteries into printed devices
- Lead a team of three undergraduate and Masters students to develop and test processes for fabricating electronic devices with embedded energy storage

DRAPER Cambridge, MA

Member of the Technical Staff I, Micro/Nano Fabrication Engineer Jul 2017 – Aug 2020

- Developed novel hydrodynamic processes to fabricate nanolitz wire bundles for high frequency RF devices
- Engineered methods to integrate commercial thermoelectrics into a flexible system
- Developed custom testing hardware to test dielectric breakdown strength of microsystem assembly parts
- Characterized electrical properties of reactive materials for creating stable and conductive printable inks
- Trained peers and new hires on various fabrication and characterization instruments
- Mentored interns and assisted with design of experiments

HARVARD BIOROBOTICS LABORATORY Cambridge, MA

Undergraduate Researcher Sept 2016 – Apr 2017

- Prototyped hardware controllers to improve control of a 4-DOF robotic ultrasound catheter for minimally invasive heart surgery using 3D CAD, rapid prototyping, and machining
- Enabled communication between the controller, sensors, and robotic catheter system using C/C++
- Designed and conducted user testing experiments to optimize interface performance and usability

DRAPER Cambridge, MA

Heterogeneous Microsystems Intern Jun 2016 – Mar 2017

- Worked cross functionally to design mechanical enclosures for biologic and aerospace applications
- Evaluated thermal behaviors of physically secured technology using finite element analysis via COMSOL
- Developed end-to-end processing to assemble a miniature thermoelectric array for miniature satellites

Publications

Fossdall FH, **Nguyen V**, Heldal R, Cobb CL, Peek N. "Vespidae: A Programming Framework for Developing Digital Fabrication Workflows". In *Proceedings of the 2023 ACM Designing Interactive Systems Conference.* ACM: Pittsburgh PA USA, 2023; 2023-2049. DOI: https://doi.org/10.1145/3563657.3596106.

Bruss IR, Mutha HK, Stoll K, Collins B, **Nguyen V**, Carter DJD, Brenner MP, and Russell KJ. "Twirling, Whirling, and Tensioning: Plectoneme Formation and Suppression in Flexible Filaments". *Physical Review Research*. 2019; 1(3):032020. DOI:https://doi.org/10.1103/PhysRevResearch.1.032020.

Conferences

Katz MER, **Nguyen V (Co-presenter)**, Abraham D, Cobb CL. "Investigation of 3-Dimensional Structured Anodes for Fast Charging of Lithium-Ion Batteries". Materials Research Society Spring Meeting, April 2024. **Best Poster Award.**

Nguyen V (Presenter), Katz MER, Fossdal FH, Peek N, Cobb CL. "Additive Manufacturing of Compact and Conformal Microbatteries". Batteries – Gordon Research Conference, February 2024.

Nguyen V (Presenter), Lewis PH, Smith BR, Barron SC, Sriram TS, Fritz GM. "Directed Electrical Post Processing of Printed Silver Ink for Improvement to Conduction and Microstructure". Materials Research Society Fall Meeting, November 2017.

Awards

University of Washington Clean Energy Institute Graduate Fellowship. June 2021. Two quarters of funding, awarded to exceptional researchers studying energy applications across a variety of fields.

University of Washington College of Engineering Dean's Fellowship. June 2020. Three quarters of funding awarded to top incoming doctoral students nominated by their department.

Draper Outstanding Contributor Award. June 2019. Awarded to a small portion of employees for outstanding contributions to projects and Draper over the past year.

Draper Recognition Award. October 2018. Given for noteworthy contributions to a particular project.

Skills

Technology: Python | MATLAB | LabVIEW | C/C++ | C# | Arduino | Git | Agile (Atlassian) | Microsoft Office

Design & Model: 3D CAD (SolidWorks, AutoDesk, Rhino/Grasshopper) | Finite Element Analysis (COMSOL, ANSYS) | Geometric Dimensioning & Tolerancing (GD&T) | PDM

Test, Measure, & Analyze: mechanical properties (tensile, shear, peel, etc.) | electrochemical cell characterization (BioLogic) | electrochemical impedance spectroscopy | 4-point probe | optical & Confocal Microscopy (Zeiss, KEYENCE) | profilometry | rheology (TA Instruments) | Seebeck coefficient (Netzch) | dielectric breakdown | glovebox (Mbraun) | Statistical analysis | Design of experiments

Fabrication: 3D Printing/additive manufacturing (FDM, SLA, DIW) | laser cutting | blade casting | coin cell assembly | wire bonding | die bonding | soldering | breadboarding | basic machining | electrolytic plating. Knowledge of various manufacturing techniques (injection molding, stamping, etc.)