Vinh Nguyen

(617) 272-0513 | vinhqnguyen1995@gmail.com | vinhqnguyen.com | Seattle, WA

Education

UNIVERSITY OF WASHINGTON Seattle, WA

Ph.D. Program in Mechanical Engineering Sep 2020 - Present

Advisor: Professor Corie L. Cobb
Anticipated Graduation Date: 06/2027
GPA: 3.96 / 4.00

HARVARD UNIVERSITY Cambridge, MA

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

Thesis: *User Interface Design for 4-DOF 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 Sep 2020 – Present

- Design an open-source, multi-material hybrid additive manufacturing hardware platform to enable in-situ printing of printed electronics, Lithium-ion batteries, and soft wearable devices
- Develop extensible toolpath generation software using C# to enable multi-axis, 3D conformal printing and other unconventional additive manufacturing techniques for efficient fabrication of multi-functional devices
- Engineer prototype coaxial and arrayed printheads for scalable manufacturing of multi-functional composites and 3D batteries with up to 100% improved energy density at high discharge rates
- Analyze electrochemical and rheological data of battery materials using Python to inform process design
- Investigate material and processing compatibilities for integrating printed batteries into printed electronics
- Lead a team of 3-5 undergraduate and Masters students to fabricate 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 spin electrically-conductive polymer nanofibers (10-100 μm) into nanolitz wire bundles for improving the performance of GHz-frequency RF devices
- Designed processes for integrating commercial thermoelectrics into a flexible, low-cost system
- Designed hardware to characterize dielectric breakdown strength of MEMS components
- Validated electrical post-processing techniques to improve electrical conductivity of silver inks by up to 5x
- Evaluated mechanical behaviors of epoxies via shear and tensile tests for aerospace applications
- Developed an end-to-end manufacturing process to fabricate thermoelectric arrays for nanosatellites
- Communicated proposed experimental designs and data on mechanical and electrical testing to cross-functional teams to inform decisions on material selection and manufacturing processes

HARVARD BIOROBOTICS LABORATORY Cambridge, MA

Undergraduate Researcher Volunteer Sep 2016 – Apr 2017

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

Publications and Peer-Reviewed Proceedings

VQ Nguyen, AE Harding, K Yan, N Peek, CL Cobb. "Jitterbug: A Hybrid Digital Fabrication Platform for Rapid Prototyping of Printed Electronics". In *Proceedings of the 2025 ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference.* ASME: Anaheim CA USA, 2025. In Press.

FH Fossdall, **V Nguyen**, R Heldal, CL Cobb, N Peek. "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.

IR Bruss, HK Mutha, K Stoll, B Collins, **V Nguyen**, DJD Carter, MP Brenner, and KJ Russell. "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.

Conference Presentations

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

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

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

Skills

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

Design & Model: 3D CAD/CAM (SolidWorks, Autodesk Inventor/Fusion, Rhino/Grasshopper) | Finite Element Analysis (COMSOL, Ansys) | Geometric Dimensioning & Tolerancing (GD&T) | PDM

Test, Measure, & Analyze: mechanical (tensile, shear, peel, etc.) | rheology (TA Instruments) | electrochemical impedance spectroscopy (EIS) | electrochemical cell characterization (rate capability, cycle life, cyclic voltammetry) | optical & Confocal microscopy | dielectric breakdown | Statistical analysis | Design of experiments (DOE) | profilometry | clean room experience

Fabrication: 3D Printing/Additive manufacturing (FDM, SLA, DIW) | coin cell assembly | blade casting | breadboarding | soldering | basic machining | laser cutting. Knowledge of manufacturing techniques (injection molding, stamping, etc.). Basic experience with fibers and textiles (crochet, knitting, hand loom, embroidery).

Awards

University of Washington Clean Energy Institute Graduate Fellowship. 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. 2020. Three quarters of funding awarded to top incoming doctoral students nominated by their department.

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

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