ROWAN ROLARK

Northwestern University, Department of Mechanical Engineering
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EDUCATION

Northwestern University *Expected: June 2027*
Ph.D. in Mechanical Engineering

University of Hawaii at Mānoa *May 2022*
B.S. in Mechanical Engineering
GPA: 3.70

RESEARCH EXPERIENCE

Graduate Researcher September 2022 - Present
Advanced Manufacturing Processes Laboratory, Northwestern University *Evanston, IL*

- Developing advanced metal additive manufacturing techniques with expertise in powder-blown laser-based directed energy deposition (DED)
- Identifying complex multiphysic relationships between fundamental process parameters, material properties, and part performance
- Implementing control schemes for precise material deposition to fabricate functionally graded materials

Materials Engineering Research Intern June 2022 - August 2022
Lawrence Livermore National Laboratory *Livermore, CA*

- Prototyped a dual-use chamber for printing and cell growth for the development of bioprinted lung models as a platform for studying SARS-CoV-2 infection
- Designed a process workflow that integrated computed axial lithography with projection micro-stereolithography to achieve high-resolution, multiscale prints

Research Associate July 2020 - August 2022
Ray Research Group, University of Hawaii at Mānoa *Honolulu, HI*

- Led a research project fabricating 3D-printed microfluidic devices for smart wearables that collect and analyze sweat to diagnose diseases
- Operated and maintained first-class additive manufacturing platforms (including digital-light processing, stereolithography, and liquid-crystal display 3D printing technologies)
- Utilized high-precision metallurgical microscopes for imaging and the characterization of 3D-printed samples

Undergraduate Research Fellow August 2021 - July 2022
NASA Hawaii Space Grant Consortium *Honolulu, HI*

- Co-authored a proposal to the Hawaii Space Grant Consortium, a NASA-supported initiative, where my group pursued the design and manufacturing of customized life-detection instruments in a simulated Martian rover
- Design lead engineer and systems integrator for the rover's science payload involving the collection, preparation, and testing of mineralogical samples for signs of life
- Researched and developed robotic methods for soil chemical assays conducted on-site

RESEARCH GRANTS

Design and Development of a Low Cost Life-Detection Payload for the Investigation of a Simulated Martian Environment January 2022 - June 2022
NASA Hawaii Space Grant Consortium, $12,000 *Honolulu, HI*

- Principal Investigator: Dr. Frances Zhu
- Role: Co-author. The research I led focused on integrating and implementing life detection instruments (Raman spectroscopy and microfluidic devices) on space exploration rovers. I contributed toward idea conception, guided the project goals, and co-authored the grant proposal.

FELLOWSHIPS & AWARDS

Leadership Service Award

NSF HAMMER Engineering Research Center (2024)

Predictive Science and Engineering Design Fellowship

Northwestern University (2023)

Walter P. Murphy Fellowship

Northwestern University, $35,000 (2022)

Hawaii Space Grant Consortium Research Fellowship

University of Hawaii at Mānoa, 2021, $2,500 (2021)

PROJECTS

Predictive Maintenance Program January 2022 - May 2022
Pearl Harbor Naval Shipyard & Intermediate Maintenance Facility *Honolulu, HI*

- Established an innovative predictive maintenance program to monitor and analyze the health of shipyard equipment to prevent machine failures
- Conducted market research on solutions for installing a sensory suite (measuring usage, temperature, vibration, and sound) and analyzing condition monitoring data

PRESENTATIONS

Rolark, F., Ray, T. "High precision 3D-printed molds for soft lithography of epidermal microfluidic devices" *Summer Undergraduate Research Experience (SURE) Symposium 2021.*

COMMUNITY ENGAGEMENT

President May 2024 - Present
Student Leadership Council, NSF HAMMER Engineering Research Council *Evanston, IL*

- Represented a large organization of students spanning across 5 universities and communicated between students, center administration, and industrial partners.
- Organized outreach events such as Women in Manufacturing Day, where HAMMER students engaged with 250+ female high school students and exposed them to advanced manufacturing and research opportunities

President January 2024 - Present
Mechanical Engineering Graduate Student Society, Northwestern University *Evanston, IL*

- Led departmental events and initiatives by communicating with department leadership and facilitating efforts for more faculty-student networking

Activity Coordinator January 2023 - March 2023
Unseen Identities in STEM, Northwestern University *Evanston, IL*

· Organized events centered on uplifting underrepresented minority groups in STEM, such as discussion panels featuring industry professionals and senior graduate students

Diversity, Equity, and Inclusion Seminars December 2016 - July 2020
Teach for America *Honolulu, HI*

· Lectured and informed 30+ educators on how to be inclusive and how to create safe spaces and address conflict in a classroom setting to support underrepresented students
· Held multiple interactive one-hour seminars at Chaminade University of Honolulu and a local middle school
· Hosted a supplemental question-and-answer session on how to curate a safe environment for underrepresented students

TECHNICAL SKILLS

Programming Languages	MATLAB, Python, R, C++, G-Code, Java
CAD Modeling	AutoCAD, SolidWorks, Fusion360, Google Sketchup, Meshmixer
Software & Tools	ImageJ, nTopology, ABAQUS