

ANNA V. ALVAREZ

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EDUCATION

University of California Santa Barbara <i>PhD in Mechanical Engineering</i>	Oct 2021-Present GPA: 3.91/4.00
University of Illinois at Urbana-Champaign <i>Bachelor of Science in Mechanical Engineering</i>	May 2021 GPA: 3.80/4.00

RESEARCH EXPERIENCE

Hawkes Research Lab <i>PhD Candidate</i>	Santa Barbara, CA Sept 2021-Present
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- Developing an inertially controlled jumper which utilizes on board sensors to land on its feet and recoup energy
- Performed rapid prototyping of soft robotic design and mechatronic systems, while also managing the acquisition of necessary components
- Communicated research plans and results with collaborators at UC San Diego and Georgia Tech
- Modeled the elastocapillary imbibition of Spanish Moss trichomes with a 6th order PDE to better understand the correlation between flexible cell geometry and water transport.
- Studying jumping mechanics on granular media for optimizing locomotion strategies on lunar surfaces.
- Modeled the dynamic eversion and scaling of vine robots with a release mechanism inspired by jellyfish stinging cells. Prototyped soft robot design with various textiles and adhesives
- Built a fixed-wing unmanned aerial vehicle with the ability to perform vertical jumps midair, allowing for dynamic maneuvers with minimal energy loss

Bio-Inspired Adaptive Morphology Lab <i>Research Assistant</i>	Urbana, IL Sept 2019-June 2021
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- Constructed a bird-inspired wing actuation system that allows for high angle of attack landings
- Designed a test matrix for wind tunnel experiments and collected data through LabView

Cornell CNF Research Experience for Undergraduates <i>Undergraduate Research Intern</i>	Ithaca, NY June 2019-Aug 2019
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- Developed a thermally responsive, origami patterned, liquid crystal film for micro-robotic applications
- Utilized cleanroom equipment including contact aligners, silicon etchers, plasma etchers, and profilometers
- Designed lithography masks using the L-Edit program

Pinshane Huang Research Group <i>Research Assistant</i>	Urbana, IL Sep 2018-June 2019
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- Examined 2D heterostructure properties in order to devise a systematic procedure which tunes material properties by altering the defects, dopants, and interfaces
- Trained on SEM microscope for surface characterization and energy dispersive x-ray spectroscopy

Cornell NeuroNex Research Experience for Undergraduates

Undergraduate Research Intern

Ithaca, NY

June 2018-Aug 2018

- Improved resonant frequencies of linear scanners to a range suitable for optical imaging
- Redesigned high-speed linear scanners for use in a new multimodal brain imaging technique to help better understand neurovascular coupling
- Operated function generators and oscilloscopes to drive actuators
- Established new protocols for standardized scanner assembly

PUBLICATIONS

- Alvarez, A., Seawright, A., Tripathi, N., Cruz, C., Deng, S., & Hawkes, E. W. (2025). High-Velocity, Pressure-Driven Eversion for Rapid Vine Robots. *IEEE Robotics and Automation Letters*.
- Girerd, C., Alvarez, A., Hawkes, E. W., & Morimoto, T. K. (2024). Material Scrunching Enables Working Channels in Miniaturized Vine-Inspired Robots. *IEEE Transactions on Robotics*.
- Alvarez, A. V., Devlin, M. R., Naclerio, N. D., & Hawkes, E. W. (2022, October). Jumping on Air: Design and Modeling of Latch-mediated, Spring-actuated Air-jumpers. In *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (pp. 13220-13226). IEEE.
- Alvarez, A., & Wissa, A. (2021, September). Bird-inspired morphing wings: Design and experimental evaluation of a wing folding mechanism for pitch stability control. In *Smart Materials, Adaptive Structures and Intelligent Systems* (Vol. 85499, p. V001T01A017). American Society of Mechanical Engineers.
- Alvarez, A., Liu, Q., & Cohen, I. (2019). "Responsive Liquid Crystal Micro Actuators for Microrobotic Applications". CNF Yearly Report.

TEACHING AND MENTORSHIP POSITIONS

Mechanical Engineering Graduate Student Association

Vice President

Santa Barbara, CA

May 2025-Present

- Leveraged shared resources between departments to organize industry guest speakers and cross-departmental social events to promote graduate student networking

Summer Research Academies

Instructor of Record

Santa Barbara, CA

July 2024

- Developed 12 lectures, organized 4 labs, and trained 2 teaching assistants for a bio-inspired engineering course of my own design
- Supervised 10 separate research projects chosen and run by the class of 30 students, culminating at a Capstone Seminar and 7 page research report
- Taught topics ranging from aerodynamics, soft robotics, energy storage, and material testing

Summer Institute in Mathematics and Science (SIMS)

Graduate Mentor

Santa Barbara, CA

Aug 2023-Sep 2023

- Mentored four incoming freshmen on science communication and research techniques
- Developed a 2 week itinerary and wrote lectures for said students on soft robotics
- Facilitated labs where students discovered how to model and optimize artificial muscles.

Summer Research Academies

Santa Barbara, CA

Teaching Assistant

June 2022-July 2022

- Guided 30 high school students through the processes of designing and testing their own soft robot prototypes
- Designed discussion sections to teach students the process of writing research papers
- Supervised use of laboratory equipment, including pressurized air and power tools

Department of Mechanical Engineering

Urbana, IL

Teaching Assistant

June 2020-Aug 2020

- Redesigned a senior level mechanical engineering course to be compatible with online teaching during COVID 19
- Recorded lecture videos and interviewed students which guided the creation of instructional materials
- Collaborated with four mechanical engineering professors and three doctorate students to finalize the course project

ORAL CONFERENCE PRESENTATIONS

- “Elastocapillary Imbibition of Tillandsia Trichomes” The Society for Integrative and Comparative Biology 2026, Portland, OR
- “Jellyfish Inspired Stingers: Design and Modeling of Latch-mediated Spring-actuated Projectiles” Gordon Research Seminar 2024, Ventura, CA
- “Jumping on Air: Design and Modeling of Latch-mediated Spring-actuated Air Jumping”, IROS 2022, Kyoto, Japan
- “Bird-inspired Morphing Wings: Design and Experimental Evaluation of a Wing Folding Mechanism for Pitch Stability Control” SMASIS 2021
- “Responsive Liquid Crystal Films Micro Actuators for Microrobotic Applications.” Emerging Researchers National Conference 2020, Washington, D.C.

HONORS AND AWARDS

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| • ASME Graduate Teaching Fellowship | 2025 |
| • Rising Stars in Mechanical Engineering Workshop | 2024 |
| • UCSB Grad Slam Finalist | 2023 |
| • NSF Graduate Research Fellowship | 2022 |
| • Triumph Group for Diversity and Inclusion Scholarship | 2022 |
| • Hertz Fellowship Finalist 2022 | 2022 |
| • Hispanic Scholarship Fund | 2021 |
| • Hertz Fellowship Finalist 2021 | 2021 |
| • Clare Boothe Luce Research Scholar | 2020-2021 |
| • Barry Goldwater Scholarship Campus Nominee | 2019 |
| • James Scholar- Honors Program | 2017-2020 |

Computer Skills: Python, MATLAB, SolidWorks, Arduino**Power Tools:** Drill Press, Laser Cutters, 3D printers

Cleanroom Skills: General Chemistry Hoods, Microfluidics, Mask Writers, MVD 100, Oxford 81, Contact Aligner

Miscellaneous: Wind tunnels, Particle Imaging Velocimetry