DAVID BOMBARA

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LinkedIn ⋄ Google Scholar

EDUCATION

Harvard University *August 2022–Present*
Doctor of Philosophy in Materials Science & Mechanical Engineering
Relevant Courses: *Bioinspired Robotics* (MIT), *Numerical Methods*, *Underactuated Robotics* (MIT).

University of Nevada, Reno *August 2020–August 2022*
Master of Science in Mechanical Engineering Cumulative GPA: 4.000/4.000
Relevant Courses: *Linear Systems* (A), *Control Systems II* (A), *Machine Intelligence* (A), *Nonlinear Control Systems* (A), *Digital Control Engineering* (A), *Adaptive Control* (A), *Autonomous Mobile Robots* (A).

University of Nevada, Reno *July 2016–May 2020*
Bachelor of Science in Mechanical Engineering Cumulative GPA: 3.834/4.000
Honors Program graduate; Dean's List recipient for seven semesters.
Relevant Courses: *Introduction to Robotics* (A), *Introduction to System Control* (A).

EXPERIENCE

Harvard John A. Paulson School of Engineering & Applied Sciences August 2022–Present
Graduate Research Assistant *Boston, MA*

- Studying control theory and computational robotics.
- **References:** Hank Yang, Ph.D., hankyang@seas.harvard.edu

NASA Johnson Space Center May 2022–August 2022
Visiting Researcher, Robotic Systems Technology Branch *Houston, TX*

- Hardware prototyping of a servo-driven robotic gripper with **switchable finger kinematics**.
- Quantitative analysis of twisted string actuators for potential use in NASA's **humanoid robots**.
- **Skills:** MATLAB, Autodesk Fusion 360, ROS, C++.
- **Reference:** Evan Laske, evan.laske@nasa.gov

Smart Robotics Laboratory, University of Nevada, Reno August 2020–May 2022
Graduate Research Assistant, Department of Mechanical Engineering *Reno, NV*

- Studied **soft robotics**, robotic **actuators**, nonlinear **control systems**, nonlinear **model identification**, **adaptive control**, electric motors, and robotic grippers/manipulators.
- **Skills**: MATLAB, SIMULINK, C/C++, 3D printing, circuit prototyping, mathematical optimization, scientific writing.
- **Reference**: Jun Zhang, Ph.D., jun@unr.edu

NASA Langley Research Center June 2020–May 2021
Intern, Advanced Measurements and Data Systems Branch *Hampton, VA (Virtual)*

- Surveyed literature on the qualification and **testing of materials in low-earth orbit** (LEO), including *in situ* evaluation missions and simulated LEO environments.
- Developed a system for automated real-time characterization of **phase-change tunable optical filters** using a linear variable filter and infrared camera for wide-field mid-wave infrared imaging
- **Skills:** MATLAB, C/C++, circuit simulation, scientific writing.
- **Reference:** Hyun Jung Kim, Ph.D., hyunjung.kim@nasa.gov

Smart Robotics Laboratory, University of Nevada, Reno November 2018–June 2020
Undergraduate Research Assistant, Department of Mechanical Engineering *Reno, NV*

- Studied self-sensing and large strain twisted strings actuators made from conductive supercoiled polymer strings, with applications to assistive devices and soft robotics.
- Wrote programs to automate data acquisition of length/strain, voltage, and electrical resistance of the artificial muscle actuators. Conducted the corresponding experiments.
- **Skills**: LabVIEW, C/C++, MATLAB.

· **Reference**: Jun Zhang, Ph.D., jun@unr.edu

NASA Ames Research Center June–August 2019
Intern, Rotorcraft Aeromechanics Branch *Mountain View, CA*

· Prototyped a circuit containing sound, ultrasonic distance, temperature, and gas sensors to be mounted on a mobile robot with applications in autonomous indoor urban search and rescue.
· Developed **Bluetooth communication system** for live data stream between robot and base station.
· **Skills:** MATLAB, C++.
· **Reference:** Lee Kohlman, Ph.D., lee.w.kohlman@nasa.gov

Western States Fire Protection May–August 2018
Design Intern *Las Vegas, NV*

· Routed virtual standpipe and sprinkler pipe routes using building information modeling (BIM) software for future 400,000 ft^2 Wynn convention center; designed fire sprinkler and pipe layout for three- and four-story residences.
· **Skills:** AutoCAD, Revit
· **Reference:** Christopher Menge, chris.menge@wsfp.us

Nevada Department of Transportation May–August 2017
Public Service Intern, Construction Division *Las Vegas, NV*

· Conducted laboratory experiments on construction aggregate for Nevada's largest-ever public works project.
· **Reference:** Martin N. Strganac, P.E., mstrganac@dot.nv.gov

FELLOWSHIPS

NSF Graduate Research Fellowship September 2022–August 2025
National Science Foundation

NASA Space Technology Graduate Research Opportunities Fellowship August 2021–August 2022
NASA Space Technology Mission Directorate

· Funding for the proposal, "Design, Fabrication, and Control of a Robotic Gripper Powered by Compliant and Self-Sensing Twisted String Actuators."

Graduate Research Opportunity Fellowship May 2021
Nevada NASA Space Grant Consortium

· Declined due to also receiving the NSTGRO fellowship.

SCHOLARSHIPS AND AWARDS

2021 Best Paper Award May 2022
IEEE Robotics and Automation Letters

· Award given for the paper, "Experimental Characterization and Modeling of the Self-Sensing Property in Compliant Twisted String Actuators."

Exceptional Contribution Award August 2020
Advanced Measurements and Data Systems Branch of NASA Langley Research Center

· "In recognition of your dedication and significant technical contributions towards the development of a reliability test for an actively tunable mid-wave infrared optical filter."

SERVICE

College of Engineering, University of Nevada, Reno August 2021–December 2021
Outreach Student Worker *Reno, NV*

· Coordinated labs tours for K–12 students.
· Spoke to prospective students at UNR's *Nevada Bound* events, where students would fly from Las Vegas, NV to Reno, NV and learn about undergraduate engineering programs.