

GRANT PROPOSALS

Funded Proposals

- National Science Foundation** NSF | Foundational Research in Robotics
EAGER: Robust Data-Driven Robotic Manipulation via Bayesian Inference and Passivity-Based Control,
ACTIVE Boise State PI, (University of Kentucky PI: Hasan Poonawala)
August 01, 2023 – July 31, 2023, \$262,193.
- US Army** SBIR A232-014-0383
Power Line Perching Drone
ACTIVE PI, (co-PI: Zachary Adams of Pitch Aero),
September 15, 2023 – September 14, 2024, \$167,345.
- US Navy** SBIR N231-071-1180
Compact Touch-Capable Drone for Non-Destructive and Visual Inspection in Elevated and Small Spaces, PI, (co-PI: Zachary Adams of Pitch Aero),
ACTIVE September 01, 2023 – August 31, 2024, \$180,000.
- Dept. of Energy Off. of Electricity** SBIR C56-08b
Drone-Deployable Transmission Sensor Unit for Widespread Phasor, Power Quality, and Environmental Measurement to Increase Grid Throughput, Reliability, and Efficiency, PI, (co-PI: Zachary Adams of Pitch Aero),
ACTIVE September 01, 2023 – August 31, 2024, \$200,000.
- National Inst. of Health** COBRE Extension P20GM109095
Role of Cellular Mechanotransduction of Low Intensity Vibrations in Regulating Extracellular Matrix Synthesis, co-PI (\$163,534 my part),
ACTIVE (PI: Gunes Uzer of Boise State), Oct. 01, 2023 – Sept. 31, 2024, \$596,397.
- National Science Foundation** Major Research Equipment
Track 1 Acquisition of a Digital Real-Time Simulator to Enhance Research and Student Research Training in Next-Generation Engineering and Computer Science co-PI, (PI: Eklas Hossain of Boise State),
ACTIVE August 21, 2023 – August 20, 2026, \$294,451.
- US Dept. of Agriculture** SBIR: *Installation of Multiple Bird-Diversers on Power Lines via Drone*,
PI, (co-PI: Zachary Adams of Pitch Aero), July 01, 2023 –
ACTIVE March 01, 2024, \$180,000.
- INBRE Biomed** *Detection of Cellular Fibrous Networks via Machine Learning*
ACTIVE PI, May 2022 – May 2024, \$130,150.
- National Science Foundation** NSF | CASIS
ISS: 3D Bone Marrow Analog to Determine the Contribution of Mechanical Signals to Aging MSC Function in Microgravity,
ACTIVE co-PI, (PI: Gunes Uzer of Boise State University)
November 01, 2020 – October 31, 2024, \$465,051.

Funded Proposals – Continued –

Bastian Solutions *Human Presence Detector*
CLOSED PI, February 01, 2021 – May 31, 2021, \$10,000.

Bastian Solutions *Automatic Calibration of Robotic Manipulators*
CLOSED PI, January 01, 2020 – May 31, 2020, \$10,000.

Pending Proposals

Proposals in Preparation

National Science Foundation Major Research Equipment
Driving Simulator for Research and Education
co-PI, (PI: Mandar Khanal of Boise State),
May 01, 2024 – April 30, 2027, \$550,000.

National Science Foundation Small Business Technology Transfer STTR
Stable Manipulation with a Cyclorotor-Based Drone Near Power Lines
PI, May 01, 2024 – April 30, 2025, \$250,000.

Declined Proposals

Department of Energy *SBIR I: Drone Collection and Evaluation of Contaminated Nuclear, and Chemical Samples for Low-Risk Facility Contaminant Characterization*
PI, (co-PI: Zachary Adams of Pitch Aero), Jun 01, 2023 – May 31, 2024, \$200,000.

Department of Energy *SBIR I: Drone-Deployed Active Thermography Sensor for Wind, Turbine Blade Subsurface Defect Detection*
PI, (co-PI: Zachary Adams of Pitch Aero), Jun 01, 2023 – May 31, 2024, \$200,000.

National Science Foundation NSF: Biomechanics and Mechanobiology
Cellular Mechanotransduction of Low-Intensity Vibrations
co-PI, (PI: Gunes Uzer of Boise State University)
Jun 01, 2023 – May 31, 2026, \$499,999.

National Science Foundation *SBIR I: Drone Infrastructure Installations,*
PI, (co-PI: Zachary Adams of Pitch Aero), Mar 01, 2023 – Feb 29, 2024, \$274,925.

National Science Foundation Foundations of Robotics
CAREER: Data-Driven Design of Passivity-Based Contact-Aware Gaussian Process Controllers, PI, September 01, 2023 – August 31, 2028, \$552,088.

Declined Proposals – Continued

- National Science Foundation** Foundations of Robotics
Collaborative: Provably Stable Control Design via Bayesian Inference for Robust Manipulation using Passivity and Automated Verification, PI, (co-PI: Hasan Poonalawa of U. of Kentucky), January 01, 2023 – December 31, 2025, \$288,882.
- National Inst. of Health** R21: Exploratory/Developmental Research Grant Program
Cellular Mechanotransduction of Low-Intensity Vibrations, co-PI, (PI: Dr. Gunes Uzer of Boise State)
October 10, 2022 – September 30, 2023, \$385,930
- National Science Foundation** Foundations of Robotics
Humanoid walking in real-world environments: learning model uncertainty for robust model-based control, PI, (co-PI: Pranav Bhounsule)
June 01, 2022 – May 31, 2025, \$255,590
- National Science Foundation** Foundational Research in Robotics
Data-Driven Energy-Shaping Control Design for Robotic Systems, CAREER PI, September 01, 2022 – May 31, 2027, \$509,061
- Amazon Research Awards** Artificial Intelligence for Robotics
Data-Driven Energy-Shaping Control Design for Robotic Systems, CAREER PI, April 01, 2022 – March 31, 2023, \$80,000
- NIH Center of Biomed. Exc.** *Detection of Extracellular and Cellular Fibrous Networks via Machine Learning*, PI, (resubmitted) March 2021 – March 2023, \$100,000
- National Inst. of Health** R01AG059923-02 NOT-OD-221-094: ML Supplement
Role of LINK-mediated Mechanosignaling in MSC Aging, co-PI, (PI: Dr. Gunes Uzer of Boise State)
October 10, 2021 – September 30, 2022, \$280,901
- National Science Foundation** Foundational Research in Robotics
One stride at a time: fast online optimal control of humanoids on complex terrain, PI, (co-PI: Pranav A. Bhounsule of U. of Chicago)
June 01, 2021 – May 31, 2024, \$254,565
- National Science Foundation** Dynamics, Control and Systems Diagnostics
Robust Control Design through Contact via Neural Ordinary and Stochastic Differential Equations, CAREER PI, September 01, 2021 – August 31, 2026, \$505,243
- National Science Foundation** IIS: Information and Intelligence Systems
Optimal Manipulator and Controller Design for Decentralized Robotic Actuation, PI, September 01, 2019 – August 31, 2022, \$263,992
- US Army** AP17-005: Great Vehicle Systems (GVS)
Robotic Tool Kit (RTK) Logistics and Automation, co-PI, (PI: Steve Swanson of Boise State), October 01, 2019 – December 01, 2020, \$100,000

Declined Proposals – Continued

National Science Foundation	EFMA: Emerging Frontiers in Research and Innovation <i>Octoboteel: Swim Like an Eel, Manipulate Like an Octopus</i> PI, September 01, 2018 – August 31, 2022, \$1,999,999
National Science Foundation	CMMI – S&CC: Smart and Connected Communities <i>Efficacy, Adoption, and Resilience of Decentralized and Community Based Demand Response Programs</i> , co-PI, (PI: John Gardner of BSU) October 01, 2018 – September 30, 2022, \$1,949,245
National Aeronautics Space Admin.	80HQTR20NOA01-20ECF B1:Early Career Faculty (ECF) <i>Multi-Robot Coordination for Dynamic Manipulation and Extreme Terrain Traversal</i> , PI, October 10, 2020 – September 31, 2023, \$544,052
National Inst. of Health	R15: NIH Research Enhancement Award <i>Robotics inspired Knee BRACE: Biomechanical model that restrains and alleviates cartilage damage</i> , co-PI, (PI: Dario Villarreal of SMU) October 10, 2020 – September 30, 2023, \$429,682
US Department of Agriculture	USDA-NIFE-AFRI-006739: Agriculture and Food Research Initiative <i>Sustainable Food Safety Systems for Biofilm Mitigation in Food Processing</i> , co-PI, (PI: Jim Browning of Boise State), August 01, 2020 – July 31, 2025, \$9,997,940
Office of Naval Research	<i>Control of Autonomous Landing of Unmanned Aerial Vehicles</i> , co-PI, (PI: Inanc Senocak of U. of Pittsburgh) March 01, 2018 – March 01, 2021, \$700,000
Office of Naval Research	<i>High-Fidelity Flow Analysis and Control of Undulatory Fish Locomotion</i> , PI, January 01, 2018 – January 01, 2021, \$650,000

CURRENT RESEARCH STUDENTS

Name	Degree	Discipline	Role	Expected Graduation
Chris Dagher	PHD	Computing	Advisor	Spring 2027
Farnaz Darghiasi	PHD	Biomedical	Co-Advisor	Spring 2027
Chandika Silva	MS	Mechanical Eng.	Advisor	Spring 2025
Omor Khan	MS	Mechanical Eng.	Advisor	Fall 2023
Alex Peterson	MS	Mechanical Eng.	Advisor	Fall 2024
Yafa Benavidez	UG/FT MS	Mechanical Eng.	Advisor	Spring 2025
Nina Nikitina	N/A	Computer Science	Mentor	Graduated
Oliver Macdonald	UG	Mechanical Eng.	Advisor	Spring 2024