Brian K. Johnson

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US citizen able to obtain security clearance

SUMMARY

- Successfully led multi-year collaborative projects in robotics and control systems.
- Breadth of experience in AI/ML, simulation, signal processing, data science.

EXPERIENCE

Postdoctoral Research Scientist **Nov. 2022 – Nov. 2024**
Max Planck Institute for Intelligent Systems *Stuttgart, Germany*

- Led engineering projects in user-interactive robots, machine learning, and electrostatic systems.
- Developed ML-based algorithms and hardware for a user-interactive touch screen device.
- Estimated real-time sensor measurements by training LSTM sequence models.
- Organized business conferences and managed laboratory equipment.

National Science Foundation Graduate Research Fellow **Aug. 2018 – Aug. 2022**
Advanced Medical Technologies Laboratory *Boulder, CO*

- Implemented real-time discrete control of a 100-actuator, 100-sensor nonlinear interactive robot.
- Performed loop closure using visual, magnetic, and capacitive-based sensor systems.
- Designed and evaluated gradient descent algorithms for dynamic object manipulation tasks.
- Wrote successful grant proposals to secure research funding totaling $150k.

Structural Dynamics R&D Intern **Jun. 2017 – Aug. 2018**
Sandia National Laboratories *Albuquerque, NM*

- Performed multi-input/multi-output data analysis on mechanical vibration tests.
- Developed signal processing algorithms to filter harmonic noise from test data.
- Published an open-access technical report to documenting filtering techniques.

Technical Specialist Intern **Jun. – Aug. 2016**
Lockheed Martin Rotary and Mission Systems *Owego, NY*

- Tested VH-92 helicopter flight hardware under thermal, vibration, and shock environments.
- Analyzed stresses in flight rack panels and stiffeners for FAA certification.

Mechanical Engineering Intern **Jun. – Aug. 2015**
Doron Precision Systems Inc. *Binghamton, NY*

- Designed and drafted the enclosure system for a $100k Haul Truck training simulator.
- Worked with machinists and tool operators to optimize design for fabrication.

SKILLS

Programming: Python, Pandas/PyTorch/scikit-learn, MATLAB, Git, LaTeX, Jupyter, SQL

Software: Microsoft Office, SolidWorks/3D CAD, photo/video editing, vector graphics tools

Equipment: Teensy/Arduino, 3D printer, laser cutter, machine mill/lathe, oscilloscope, NI-DAQ

EDUCATION

Ph.D. Mechanical Engineering | University of Colorado Boulder **Aug. 2022**

M.S. Mechanical Engineering | University of Colorado Boulder **May 2020**

B.S. Mechanical Engineering | Cornell University, *summa cum laude* **Dec. 2017**

AWARDS

Beverly Sears Graduate Research Grant **2022**

National Science Foundation Graduate Research Fellowship **2019**
National Science Foundation

National Defense Science and Engineering Graduate Fellowship **2019**
Alternate Awardee; Department of Defense

Dean's Graduate Innovation Assistantship **2018**
College of Engineering, University of Colorado Boulder

HIGHLIGHTED PUBLICATIONS

B.K. Johnson, J.S. Humbert, M.E. Rentschler, "A gradient descent approach for velocity control and object manipulation on shape displays," *under review*.

B.K. Johnson*, M. Naris*, et al., "A multifunctional soft robotic shape display with high-speed actuation, sensing, and control," *Nature Communications* **14**, 4516. (2023)

V. Sundaram*, K. Ly*, **B.K. Johnson**, et al., "Embedded magnetic sensing for feedback control of soft HASEL actuators," *IEEE Transactions on Robotics* **39**, 808-822. (2022)

K. Ly, N. Kellaris, D. McMorris, **B.K. Johnson**, et al., "Miniaturized circuitry for capacitive self-sensing and closed-loop control of soft electrostatic transducers," *Soft Robotics* **8**, 673-686. (2021)

B.K. Johnson, et al., "Identification and control of a nonlinear soft actuator and sensor system," *IEEE Robotics and Automation Letters* **5**, 3783-3790. (2020)

B. Johnson, J.S. Cap, "Removal of stationary sinusoidal noise from random vibration signals," *Sandia National Lab*, SAND-2018-1900. (2018)

*equal contribution

PERSONAL INTERESTS

Aviation (Private Pilot) | Chinese language | Piano | Photography | Science fiction