



BOISE STATE UNIVERSITY

COLLEGE OF ENGINEERING

*Micron School of Materials Science and Engineering*

## Graduate Research Assistant Position in Materials Science & Engineering Interdisciplinary Graduate Program

**Research Lab:** [Smart Materials and Systems Laboratory](#)

**Position Supervisor:** Zhangxian Deng ([zhangxiandeng@boisestate.edu](mailto:zhangxiandeng@boisestate.edu))

**Lab Overview:** Smart materials have much to offer over traditional “dumb” materials, since their properties vary controllably and reversibly because of stress, temperature, electrical, magnetic, or other external stimuli. Our lab specifically focuses on magnetostrictive, piezoelectric, and shape memory materials. By leveraging the synergies of additive manufacturing, system prototyping, and multiphysics modeling, our lab has successfully tackled challenging engineering problems from INL, NASA, and local industries. More details are available at <https://zhangxiandeng.weebly.com/>.

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**Position Description:** The SMSL seeks self-motivated Ph.D. students to investigate one of the following research problems: (1) high temperature and radiation tolerant ultrasonic transducers for advanced nuclear reactors, (2) flexible and morphing smart electronics for outer space exploration, and (3) functional smart structures for biomedical applications. A non-exhaustive list of research activities are as follows:

- **Additive Manufacturing of Smart Materials:** synthesize nanoparticle colloid inks or plastic filaments for 3D printing; use an nScript micro-dispenser or 3D printer to fabricate smart material thin films; post-process (e.g., sintering, poling, or annealing) printed films; use a mechanical load frame, magnetometer, electrical impedance analyzer to characterize physical properties.
- **Smart System Prototyping and Validation:** devise flexible sensors, energy harvesters, morphing structures, or ultrasonic transducers; design electrical circuits for signal processing and energy scavenging; customize experimental setups to validate the functionality of smart system prototypes.
- **Multiphysics Modeling:** develop constitutive models that can capture the multiphysics properties of smart materials; develop finite element frameworks for smart system prototypes.

**Preferred Qualifications:** Applicants must have a B.S. or M.S. degree in mechanical engineering, materials science, electrical engineering, physics, or a related degree with relevant coursework. Those with prior experience prototyping mechanical or electrical systems, coding experience (e.g., Matlab, LabVIEW, COMSOL, Abaqus, Python), and/or a demonstrable effectiveness in disseminating scientific results (e.g., publications or conference presentations) are encouraged to apply.

All Graduate Assistants in Materials Science & Engineering receive a stipend, full tuition waiver, and health insurance.

**Interested? Email [msegrad@boisestate.edu](mailto:msegrad@boisestate.edu)**