

Paid Research Assistant Positions for ME Students

Biomedical Optics and Imaging Lab (BOIL), Department of Biomedical Engineering, Stony Brook University

BOIL is recruiting undergraduate and MS students in Mechanical Engineering for paid, hourly research assistant positions. We build noninvasive optical instruments for brain monitoring, from benchtop systems to bedside and wearable devices, and every one of them depends on someone who can design, build, and test the mechanical side: optomechanical mounts and alignment fixtures, probe holders and headbands that stay in place on a person, 3D printed prototypes and phantoms, and the thermal and structural questions that decide whether a device can be worn. That is the skill we are hiring for.

Current Projects

- Bedside cerebral blood flow monitors based on diffuse correlation spectroscopy and speckle contrast imaging
- A portable FPGA based brain monitor for traumatic brain injury
- **Wearable overnight brain monitoring:** a self applied forehead headband for all night use at home, carrying a compact camera and laser for speckle based blood flow, multispectral reflectance, frontal EEG, PPG, motion, and temperature sensing on a flexible substrate with rigid electronic islands. The mechanical problems are contact stability during side sleeping, skin conformable packaging, strain relief and cabling, heat dissipation next to skin, repeated self application, and comfort over 8 hours.

Students are matched to a project by interest and join a team of engineers, physicists, and clinicians. They see the full path from a CAD model on the bench to a device in the neuro ICU or on a sleeping patient at home, which is direct preparation for medical device careers.

Useful Experience (not all required)

- CAD and rapid prototyping: SolidWorks or Fusion 360, 3D printing, machining, fixture and enclosure design
- Optomechanics: mounts, alignment, fiber and lens holders, vibration and stability
- Wearable and flexible device design, soft materials, skin interface mechanics, human factors
- Thermal and structural analysis, FEA, heat management for body worn electronics
- Mechanical testing and instrumentation: load cells, strain gauges, motion capture, LabVIEW or Python
- Basic electronics and data acquisition are a plus

A good senior design or hobby project counts.

Project details and recent publications: <https://sunarlab.org/research>

How to Apply

Email a single PDF with your CV and a statement of interests (1 page or less) to Prof. Ulas Sunar at ulas.sunar@stonybrook.edu. If you are already working in a research group, please discuss this with your current advisor before applying. Positions are reviewed on a rolling basis.