



Fully Funded PhD Positions in Medical Robotics and Computer-Assisted Surgery

About the Position: The Computational Robotics and Mechatronics (CRM) Laboratory at Texas Tech University is seeking applicants interested in pursuing a PhD in Medical Robotics, Devices and Computer-Assisted Surgery. The CRM Lab's research focuses on three core areas: (1) the development of soft robotic systems for minimally invasive surgery and intervention, (2) the design, actuation, and control of miniature untethered medical robots, and (3) patient-specific cardiovascular and neurovascular surgical planning and implant design optimization using physics-informed machine learning techniques.

About the Principal Investigator: Dr. Xiaolong Liu is an Assistant Professor of Mechanical Engineering at Texas Tech University, with his PhD obtained in Biomedical Engineering from the University of Tennessee, Knoxville. He previously worked at the Johns Hopkins University as a Research Scientist in the Department of Mechanical Engineering and Laboratory of Computational Sensing and Robotics (directed by Prof. Russell Taylor). Dr. Liu has served as a Principal Investigator and Co-Investigator on several research projects funded by organizations such as National Science Foundation (NSF), National Institute of Health (NIH), American Heart Association (AHA), and Maryland Technology Development Corporation (TEDCO), and has published 40+ peer-reviewed papers in IEEE, ASME, and BMES journals and conferences. His research has received recognition such as the Maryland Innovation Initiative Award and Best Paper Runner-up Award in Robotics, etc. Dr. Liu has served on NSF panels, program committees, editorial boards of multiple IEEE conferences in robotics and automation.

About Texas Tech: Texas Tech University is a top-ranked public research institution in Texas known for its excellence in research, STEM programs, and student success. Faculty in the Department of Mechanical Engineering are known for cited work on bio-inspired devices, computational mechanics, vortex dynamics, turbulence, microfluidics, nanoimprinting, physiological microstructure and translational nutrition, cardiovascular dynamics, nanomedicine, energetic and biological materials, and robust control methods. Department faculty recognitions and awards include membership in the US National Academy of Engineering and foreign Academies of Engineering and the Sciences, recognitions as Thomson-Reuters highly cited scholars, Young Investigator DOD awards, and NSF CAREER awards. The university offers access to advanced technologies and resources such as 3D printing and prototyping capabilities, high-performance computing systems, and specialized laboratories. The CRM lab is equipped with state-of-the-art medical robotic systems, surgical tracking systems, imaging sensors, and control devices that enable innovative solutions for complex medical problems.

Required Qualifications and Skills:

- We require applicants to have an MS degree in Mechanical Engineering, Biomedical Engineering, Computer Engineering, or a related field. Outstanding students with a BS degree may also be considered.
- We expect candidates to have previous research experience in at least one of the following areas: control systems, robotics, mechanical design, and/or mechatronics.
- It is desirable that the candidate has experience with finite element modeling using software such as ANSYS, ABAQUS, COMSOL, OpenFOAM, FEBio, or FEniCS.
- Strong programming skills in languages such as C++, Python, or MATLAB are highly desirable.
- Candidates must have a demonstrated commitment to publishing and presenting research findings. Publication records in peer-reviewed journals or conferences are highly valued.
- We seek individuals with a strong passion for research and the ability to work both independently and as part of a team.
- Strong writing and verbal communication skills are necessary.
- We value candidates who are respectful and committed to building an inclusive and welcoming environment.

Benefits:

- Fully covered tuition and competitive stipend
- Supportive and collaborative research environment
- The PI has established extensive collaborative partnerships with research institutions, such as Johns Hopkins University, the University of Chicago Medicine, and Children's National Hospital at Washington DC. Students at the CRM lab will have many opportunities to work with these institutions.

Application:

To apply, please reach out to Dr. Xiaolong Liu at xiaolong.liu@ttu.edu

Please send (1) your current CV, (2) your transcripts, (3) TOEFL score (GRE is waived), and (4) a cover letter describing your motivation for this application, potential research areas, and how your experience and interests make you a great fit for this position. Please use "Application for PhD Position" as the email subject.