Open PhD Student Positions on
Development of Silicon Micromechanical Resonators
Simon Fraser University, British Columbia, Canada

Introduction: We have openings for two PhD students at the Intelligent Sensing Laboratory (ISL: http://sense.fas.sfu.ca/) at Simon Fraser University, BC, Canada. We are a diverse and vibrant research team with members from different technical and cultural backgrounds that work together to find solutions for challenging problems and make exciting discoveries along the way. Our research focuses on developing advanced materials, micro- and nano-devices, sensor systems, and signal processing for sensors. Benefiting from access to two cleanrooms on SFU campus and our world-class device characterization facilities, our team has significant experience in the design and fabrication of microdevices and their characterization. We have a proven track record of innovation in the field with numerous *firsts* to our collective efforts.

Project: The successful applicants will primarily work with the team members to develop the next-generation silicon resonators for timing applications. The work will be conducted in close collaborations with our industrial partner that aims to commercialize the research results. The team members will collaborate on (i) Developing material and device models; (ii) Establishing a microfabrication process as per project requirements; (iii) Design, modelling, and characterization of the silicon test structures and microdevices; (iv) Establishing device characterization protocols; (v) Development of interface electronics; (vi) Documentation and dissemination of the results; and (vii) Interactions with our industrial partner.

Responsibilities: We seek motivated individuals to join our team of researchers and engineers who collaborate on different aspects of this project. The candidates need to be hands-on experimentalists with solid theoretical backgrounds. While the basic training for the required tools and equipment will be provided, the applicants are expected to be self-learners and rapidly acquire the technical knowledge required for their own specific projects. The students will develop material and device models, assist in microfabrication process development, characterize fabricated devices, and document the results. This knowledge will then be utilized for the development of new device designs towards project objectives, which will then be fabricated and tested against performance, reproducibility, and yield metrics.

What we offer: The positions are funded at competitive rates. The successful applicant will work within a vibrant research team and is exposed to several other projects, providing numerous opportunities for learning and contributions at different levels. Our past team members have moved on to academic and industrial positions at leading Canadian and international institutions.

How to apply: The desired start date for the position is Spring 2022. Interested individuals should forward a complete CV, including the relevant expertise, list of publications, and names of three references to Dr Behraad Bahreyni (bba19@sfu.ca). We specifically encourage members of underrepresented groups in science and engineering to apply to these positions. The initial appointment is for two years and can be renewed subject to satisfactory performance and availability of funds. Review of the applications will start immediately and will continue until the position is filled.

Required qualifications:

1) Meeting the University and School admission requirements.
2) MSc degree in Electrical, Material, or Mechanical Engineering, or a related field;
   a) Exceptional candidates with BSc degree will be considered.
3) Excellent oral and written communication skills;
4) Be intellectually motivated, curious, and problem-solver;
5) Open and adaptable mindset for respectful engagement with team members with diverse technical, professional, and cultural backgrounds;

Desired qualifications:

1) Experience with analysis and design of microdevices, especially microresonators;
2) Experience in multi-scale physical and numerical models of material responses;
3) Experience and ability to develop, characterize, and troubleshoot microfabrication processes;
4) Experience in the designing interface electronics and printed circuit boards.

Additional information:

- Intelligent Sensing Laboratory:
  https://sense.fas.sfu.ca/
- Simon Fraser University admission requirements:
  https://www.sfu.ca/gradstudies/apply/applying/requirements.html
- School of Mechatronic Systems Engineering requirements for PhD studies:
  https://www.sfu.ca/mechatronics/current-students/graduate-students/academic-programs/doctor-of-philosophy.html
- Equity, Diversity, and Inclusion at SFU:
  https://www.sfu.ca/edi.html