

# Open Graduate Student Positions on *In-Sensor Computing Platforms*

**Simon Fraser University, British Columbia, Canada**

---

**Introduction:** We have openings for MSc/PhD student applicants 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 that works 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 next paradigm in developing sensing systems is to integrate the sensing and cognition abilities at the sensor level so that patterns in the data are detected as it arrives without the need for back-and-forth transmission of data. The physical responses of devices and materials are utilized to generate context from changes in the environment. We will introduce different unconventional computers to perform this task. Similar to neural networks, these physical computers are made of interconnected nonlinear computational units that map the information from an input layer to a high-dimensional nonlinear space and whose outputs are combined to detect patterns in the data. Examples of such systems based on nonlinear photonic, electronic, and fluidic neurons have been proposed and demonstrated. We are developing systems and devices for various such cognizant sensors.

**Responsibilities:** We seek motivated individuals to join our research team who collaborate on different aspects of this project. The candidates must be hands-on experimentalists with solid theoretical backgrounds in physics, electrical/mechanical engineering, or material science. 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, build prototypes, characterize fabricated devices, and document the results.

**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](mailto: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) BSc or MSc degree in Electrical, Material, or Mechanical Engineering, or a related field;
- 2) Excellent oral and written communication skills;
- 3) Meeting the University and School admission requirements.

**Desired qualifications:**

- 1) Experience with analysis and design of sensor systems;
- 2) Knowledge of machine learning algorithms;
- 3) Experience and ability to develop, characterize, and troubleshoot devices and systems;
- 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>