



# IMAGING

## Medical Imaging Instrumentation and Software

### MISSION

The Medical Imaging Instrumentation and Software (MIIS) team will leverage the strength and success over the past OICR funding cycle by developing key components required to bridge the gap between imaging systems developers, imaging probe developers, cancer biologists and clinicians. The work will be carried out in the Robarts Imaging Research Laboratories in London and in the Centre for Imaging Technology Commercialization (CIMTEC), a not-for-profit corporation supported by the Government of Canada through the Centres of Excellence for Commercialization and Research (CECR).

### EXPERTISE

MIIS has the capability to develop image-processing tools and robotic instrumentation that can be used in a wide range of applications, from analysis of medical images to image-guided minimally invasive interventional techniques, including robotic techniques that are used to biopsy and treat tumours. The goal of these cancer interventional techniques is improved efficacy and fewer side effects. Enhanced imaging has the potential to inform more traditional ablative approaches such as surgical techniques as well as radiation therapies. Image-guided tumour ablation systems are complex and involve the integration of advanced medical imaging systems with medical and surgical robotics, radiotherapy, guidance technology and imaging probes used to identify the tumour and its margins. Some of the applications we have developed are MR/transrectal ultrasound fusion-based prostate biopsy system, 3D ultrasound-guided prostate brachytherapy system, and focal ablation of tumours in the liver and prostate.

### CAPABILITIES

Future image analysis and image-guided therapies will rely on advances in earlier detection of tumours using sensitive imaging technologies achieved through novel imaging probes and/or combined (hybrid) imaging techniques. The MIIS team has the know-how to deal with the full spectrum from analysis of images to special tools used to diagnose early tumours and guide therapies. Specifically, the capabilities we have developed are:

3D multi-modality image viewing, delineation of organ and tumour margins (segmentation), fusion of multi-modality images (registration), texture analysis of images (radiomics), 3D ultrasound biopsy guidance instrumentation, robotic systems for image-guided therapy, and image-guidance software. These capabilities are partnered with over \$50M of equipment at Robarts Research Institute, which includes four MR scanners, 20 ultrasound machines and access to a research CT scanner.

### TRACK RECORD

Over the past few years, we have filed 25 patents and been funded by the CECR program (together with OICR-Pathology) to establish CIMTEC. Together with CIMTEC, we have worked with start-ups and small companies on a variety of medical imaging projects involving development of mechnronic systems and image viewing/processing applications.

## CONTACT INFORMATION

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