

**SYSC 4907 – Fall 2026/Winter 2027**

Supervisor	Sreeraman Rajan
Co-supervisor	Sangeeta Murugkar (Physics)
Course section	K
<b>Project ID</b>	K1
Project title	Quantitative analysis of cancer margins in fluorescence microscopy images of patient tissue
Project description	<p>Prof. Sreeraman Rajan and Prof. Sangeeta Murugkar (<a href="mailto:smurugkar@physics.carleton.ca">smurugkar@physics.carleton.ca</a>) are collaborating to provide quantitative analysis of cancer margins in fluorescence microscopy images of patient tissue. Prof. Sangeeta Murugkar heads the Laboratory for Laser-Assisted Medical Physics and Engineering (LLAMPE) <a href="https://lampe.physics.carleton.ca/">https://lampe.physics.carleton.ca/</a> team. This team aims to develop non-invasive optical imaging techniques for rapid diagnostics, and to enable fundamental biophysics discovery.</p> <p>Fluorescence-guided surgery is a powerful intraoperative tool used in brain cancer surgery to achieve maximal resection of cancer tissue while preserving essential brain functions and patient performance. However, the surgeons currently rely on visual inspection of fluorescence microscopy images that involves qualitative and subjective analyses. This project aims to develop quantitative analysis of cancer margins in fluorescence microscopy images of patient tissue. The team of students will analyze fluorescence microscopy images taken during surgery before and after the tumor resection with white and blue light. The image analysis will involve multiple approaches including machine learning to discriminate between cancer and background normal tissue based on the fluorescence intensity. The team of students are expected to develop approaches for this discrimination.</p>
Program(s)	Biomedical and Electrical Computer Systems Software
Maximum number of students	3
Meeting time with supervisor (optional)	Through appointment
Do you want the student to contact you before the office assign this project to them ? (Yes/No)	Yes

