Supervisor & Project Information Form

Please complete and return via email ONLY to gdip.hres@utoronto.ca by ***Monday September 30, 2019***

Supervisor Information

MUST have unrestricted SGS appointment (appointment to supervise graduate students)

Name: Dr. Allan Okrainec	**Email: allan.okrainec@uhn.ca**
SGS Department: **IMS (Institute of Medical Science)**	**Field of Research:** Surgical Education, Expertise Research
Research Institution affiliation (if applicable): The Research Institute for Healthcare Education at UHN (TIER)	**Location of Work:** UHN - Temerty/Chang Telesimulation Centre Michener Campus, Room 618 Toronto Western Hospital, Room 14 MP 304
Student contact time (number of hours per week YOU are available to the student for any concerns or to review progress: 6 hours per week	

Project Information (will be posted on GDipHR website for student access)

TITLE:

Using Computer Platforms for Coaching Surgeons to Improve Technical Skills

DESCRIPTION (MAX 500 WORDS):

The technical skill of a surgeon is correlated with surgical performance and outcomes. Evidence demonstrates wide variation in technical skill among practicing surgeons. In order to improve individual surgeons' performance, one-on-one coaching has been proposed as a potential method to overcome current limitations in post-graduate and continuing medical education post-residency.

Professionals in many disciplines (e.g. athletes, musicians) use coaches to improve their performance – especially amongst the most elite experts in each field. Coaches help professionals identify areas of improvement followed by deliberate practice using customized exercise drills with ample repetition and immediate feedback. This method of training is seldom used in healthcare, and this deficiency leads many practitioners to plateau in a state of proficiency – especially in surgical training, where technical skills are required to achieve elite performance.

Video-based coaching for surgeons has gained significant momentum to help surgeons achieve technical mastery. With the advent of image-guided surgery (e.g. laparoscopy, robotic surgery) and the introduction of head-mounted cameras in the operating room to record operations, it is now possible to obtain high-definition videos and use them to give specific and focused feedback on different facets of a surgeon's technical performance. Despite theoretical advantages and evidence in non-healthcare settings for one-on-one coaching, there is limited evidence that the use of coaching, through best practices in surgical education, improves technical performance in the operating room. This project aims to evaluate the educational value of various computer-based telestration platforms compared to contemporary pedagogical models of surgical training. The student will have the opportunity to design e-learning interactive coaching platforms, as well as to investigate the use of tablet-based telestration technologies for surgical education amongst trainees and surgeons in practice. Students will assess whether the use of this technology can improve behavior, performance, technical skill, and surgical outcomes.

Should the student wish to continue working in the lab, they will also have the opportunity to work with computer scientists and computer graphics specialists to design virtual reality and

other advanced technological platforms that incorporate artificial intelligence and computer vision. These novel platforms would also be used for training purposes and to develop and validate objective and reproducible metrics of performance.

The participating student should expect at least 2 publications as first author in high-impact surgical/education journals from this project, in addition to co-authorship on other projects by assisting other investigators in the lab. The student will have the opportunity to attend the operating room, learn about various surgical procedures, and design interactive telestration tools to help with surgical training. The student will learn to perform a thorough literature review, identify research questions and design methodologies to address these questions. The student will learn best-practices in medical education, deliberate practice, qualitative research, development of surgical expertise, and the use of simulation-based training and other technology-enhanced learning environment (e-learning interactive platforms, mobile apps, virtual reality, augmented reality). We expect the student to have the opportunity to travel to several international and national conferences to present this work as oral/poster presentations.

If human subjects are involved, have the appropriate Research Ethics Board approvals been obtained?

☐Yes   ☒No   ☐Application Submitted (Date: to be submitted Oct 2019)

Do you expect this work will be published within the 20 months?

☒Yes   ☐No   ☐Uncertain / Other

_Student Roles & Responsibilities (__please be as specific as possible_**_)_**

The student will have access to the Temerty/Chang Telesimulation Centre lab, located on the 14th floor of the Toronto Western Hospital as well as the Michener Institute, newly renovated surgical simulation workspace. On a day-to-day basis, the student will either interact with the clinical research coordinator Caterina Masino, Dr. Amin Madani (MD PhD) who will serve as a co-supervisor, and Dr. Allan Okrainec, the primary supervisor.