

In image-guided surgery (IGS), surgical instruments are tracked and visualized with respect to patient-specific data sets. IGS has driven the field of minimally invasive surgery, which has advantages such as smaller incisions, faster recovery times and better patient outcomes with lower morbidity and mortality rates. With the move to less invasive surgery, however, came the need for novel visualization techniques to overcome the lack of a direct view of the patient anatomy and the surgeons limited field of view. With augmented reality, sound guidance and specific interaction techniques we can create a more comprehensive and accurate understanding of patient-specific anatomical information. Providing surgeons with this information in an intuitive and easy to understand way has the potential to improve surgical workflows, reduce surgical time and increase surgical precision. This talk will introduce some of the research being done in the Applied Perception Lab at Concordia University, with a focus on the development and testing of novel augmented reality visualization, interaction and guidance techniques and their application for specific neurosurgical tasks.