



2020 LEAD Capstone Poster Session

Implementation of Video Assessment of Surgical Proficiency to Improve Surgical Quality and Patients Outcomes

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Abstract

Problem:

- Medical errors and preventable adverse events correspond to the third leading cause of death and many of them occur in the operating room.
- There is not a structured system in place to assess and improve surgeons' technical skills and performance.

Action:

- Implementation of a structured and automated system of Video Based Assessment (VBA) of surgical proficiency that will be used to design interventions to optimize surgeons' performance in the operating room.

Results:

- Implementation of this program will allow surgeons/trainees to become safer and more proficient, improve patient outcomes and decrease hospital costs.



Objective

- To implement a structured and automated system for quality assessment of surgical proficiency that could be used to optimize surgeons' performance, improve patient outcomes and decrease hospital costs.



Background Information

- **Medical errors** correspond to the third leading cause of death in the United States.
- Majority of medical adverse events are **surgical** with over half of them being likely **preventable**.
- Growing body of literature indicating that a **surgeon's technical skills/proficiency** directly correlates with patient risk-adjusted outcomes and complications.
- Complications significantly **increase hospital costs**.
- There is not a system in place to assess surgical proficiency in the operating room and improve performance and **patient outcomes**.



Specific Aims

- To develop a structured and automated system of Video-Based Assessment (VBA) of surgeon's operative skills
- To correlate surgeon's proficiency/skills to patient perioperative outcomes and hospital cost
- To develop individualized *interventions* to improve surgical proficiency, patient outcomes and decrease hospital costs

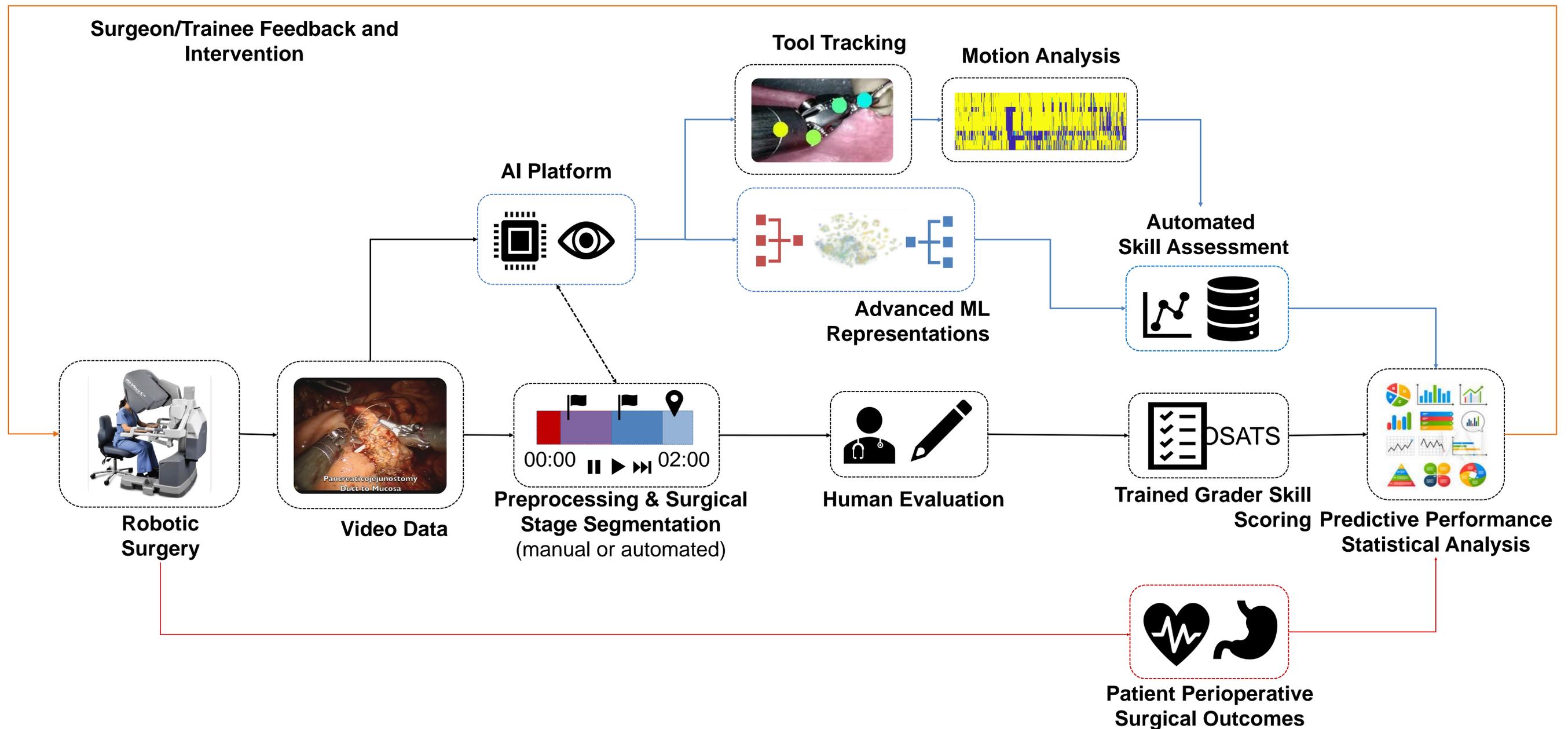


Project Plan

- Video data of laparoscopic and robotic surgeries (by trainees and faculty) will be collected
- Surgical skills assessment by trained graders (OSATS score) and artificial intelligence systems (Bioinformatics)
- Correlation with surgical skills with patient outcomes and hospital costs (via review of medical/financial records)
- Tailored quality improvement activities / *interventions* (simulation training, tech. feedback, coaching, etc.) with subsequent reassessment of results/outcomes.



Project Plan





Application of What You Learned at LEAD

Implementation of this Video Based Assessment of surgical proficiency program requires:

- Identification of problem and area of improvement
- Project designed under SMART principles (Specific, Measurable, Attainable, Relevant and Time Limited)
- Negotiation skills to get involve UTSW leadership, surgeons, faculty and trainees.
- Teamwork
- Conflict management skills (potentially) if results reveal significant areas of improvement for trainees/surgeons.



Proposed Budget

- Clinical Research Assistant / Research Fellow 0.5 FTE (\$30,000)
 - Video data collection/organization, video editing, grading/annotation of surgical videos.
- Research Scientist (Post-doc/senior staff): 0.3 FTE (\$30,000)
 - Implementation machine learning algorithms, conducting analysis, software development of the platform.
- Computer hardware, software and cloud-based data storage: (\$10,000)
- Simulation Center / Staff for training and sim. Interventions (\$20,000)
- Data Analyst/Biostatistician: 0.1 FTE (\$6,000)
- **TOTAL** **\$96,000**



Innovation and Significance

- No hospital/academic medical center in US has a structured program to continuously assess and improve surgical proficiency/skills.
- Improvement of surgical proficiency will result in less operating room (OR) times, less complications and better patient outcomes.
- Decreasing OR times and complications will result in a significant decrease in hospital costs (\$) and money saving for the UTSW health system.
- The platform of Video Based Assessment, the AI algorithms, and *interventions* could be potentially patented and commercialized.



References

- Institute of Medicine (US) Committee on Quality of Health Care in America. *To Err is Human: Building a Safer Health System*. Washington (DC): National Academies Press (US); 2000. PMID: 25077248.
- Shanafelt TD et al. Burnout and medical errors among American surgeons. *Ann Surg*. 2010 Jun;251(6):995-1000.
- Birkmeyer, J.D., et al., *Surgical skill and complication rates after bariatric surgery*. *N Engl J Med*, 2013. **369**(15): p. 1434-42.
- Fecso AB, Bhatti JA, Stotland PK, Quereshy FA, Grantcharov TP. Technical Performance as a Predictor of Clinical Outcomes in Laparoscopic Gastric Cancer Surgery. *Ann Surg*. 2019 Jul;270(1):115-120.
- Stulberg JJ, Huang R, Kreutzer L, et al. Association Between Surgeon Technical Skills and Patient Outcomes. *JAMA Surg*. 2020;155(10):960–968.