Query by videos for surgical activities

- Indexing videos of surgical activities has several applications, including context aware technologies and training. This project aims to develop and validate analytics, which given a video of a short segment of surgery, retrieve similar videos from a database, with similarity in terms of either activity, skill, or both.

- **What Students Will Do:**
  - Learn neural network-derived representations for surgical video data
  - Develop and validate metrics to discriminate videos for activity and skill

- **Deliverables:**
  - Minimum expected: A video representation and a comparison metric to discriminate between videos of same and different activities/phases
  - Optimal deliverable: minimum expected + retrieve videos of similar and different levels/scores for technical skill
  - Optional: rank skill in a given video segment relative to a library of instances of the same activity

- **Size group:** 2 (Felix Yu and Gianluca Silva Croso)

- **Skills:** Python, data structures, computer vision, machine learning, neural networks

- **Mentors:**
  - Tae Soo Kim; tkim60@jhu.edu
  - Swaroop Vedula; vedula@jhu.edu
  - Gregory Hager; hager@cs.jhu.edu

Engineering Research Center for Computer Integrated Surgical Systems and Technology