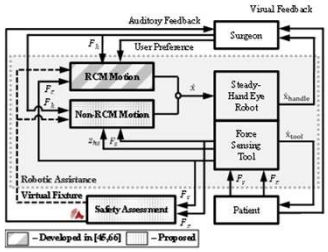
Robot Control Algorithms Based on Sclera Force Information

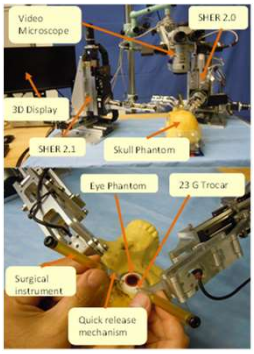
- This project aims to extend the Eye Robot (ER) control algorithms for safe robot-assisted micromanipulation based on sclera force/position feedback
- **What Students Will Do:**
- New control mode(s) with admittance variation (linear or non-linear) along the insertion depth
- Set an experiment with dry phantom, single subject experiments, statistical analyses (MATLAB)
- **Deliverables:**
- Software: C++ code, Experimental setup
- Experimental results that demonstrate feasibility
- **Size group:** **2** people
- **Skills:**



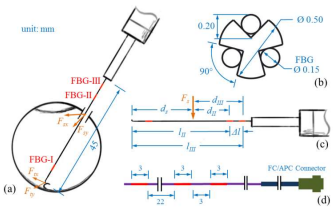
- Required: Good analytical skills, Programming (Matlab, C/C++), CAD
- Desired: Control Theory, Electronics, Prototyping,
- **Mentors:** Profs. Marin Kobilarov, Iulian Iordachita, Russ Taylor

Robot Control Algorithms Based on Sclera Force Information

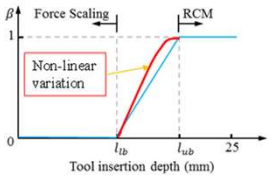
- This project aims to modify the Eye Robot (ER) control algorithms for assisting retinal vein cannulation (RVC).



JHU SHER: SHER 2.0 and 2.1 adjacent to on operating microscope (top); two instruments held by the robots, inserted through sclerotomies of a phantom eye (bottom).



Dual force sensing instrument, (a) tool shaft dimention; (b) section view of the tool shaft with the FBG sensors; (c) geometry related to tool calibration; (d) dimensions of a single fiber with three FBG sensors.



Admittance variation (linear or non-linear) along the insertion depth. The section between l_{lb} and l_{ub} is the transition between pure force scaling of the sclera force and pure RCM.