Interpretable video-based assessment of surgical skill through analytics of surgical field geometry

- Develop analytics to quantitatively describe geometry of the surgical field for automated video-based skill assessment
- **What Students Will Do:**
  - Use an existing annotated video dataset; annotate instrument tips in phacoemulsification step
  - Analyze images to segment limbus and instrument tips
  - Develop metrics to describe instrument motion relative to context (center of eye, capsulorhexis margin)
- **Deliverables:**
  - Minimum: Segment limbus, detect center of pupil, metrics to describe instrument motion relative to center of pupil
  - Optimal: Use metrics to predict binary skill class label
  - Maximum: Detect capsulorhexis margin + metrics relative to the margin
- **Size group:** 2 or 3
- **Skills:** Deep learning, computer vision, Python
- **Mentors:** Shameema Sikder & Swaroop Vedula
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Phacoemulsification

Narrated cataract surgery procedure:
https://youtu.be/oCR-86CdC6I
tiny.cc/cataract1

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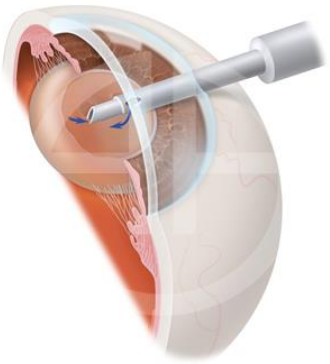
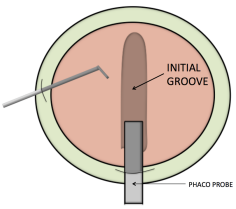
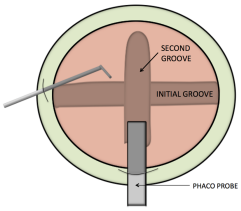
Phacoemulsification: Geometry of Surgical Field to Provide Context for Surgical Skill Assessment







Moran_CORE_25443
http://morancore.utah.edu/section-14-ophthalmic-surgery/divide-and-conquer/

https://www.aao.org/image/phacoemulsification-14

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