



Arthrex – Developing an Automated Platform for Surgical Image Artifact Identification

This project is in cooperation and partnership with Arthrex California Technology Inc located in Goleta (within biking distance of campus!). The team will have Arthrex engineers Zachary Dominguez, John Batikian, Nystha Baishya, and Jason Metzner for support.

Project Description

Background:

Arthrex designs surgical camera systems which enable surgeons to extend their vision into our bodies, in order to deliver clinical care. Maintaining a high quality, consistent, uninterrupted video feed is essential to ensure the highest reliability is achieved, as loss of video can be fatal. Moreover, with advancing technology, our systems have grown richer in features and capabilities which increase the number of possible failure modes exponentially. We've been successful in creating automation that covers this very large test footprint, but the bottleneck remains having the ability to detect issues in the video feed. Relying on humans to manually interpret thousands of hours of video is not sustainable or scalable.





The Challenge:

Design and develop a suite of tools that can be used to analyze video footage and identify issues, without the need for human intervention.

Guiding Questions

1. Define Metrics - What is a bug, what would we expect to fail? Some examples are: Incorrect colors, Frozen frames, Flickering, Resolution mismatch, etc.
3. Analysis - What methods can we use to analyze image/video? How can we verify this analysis and feel confident it's working?
4. Failure Modes and Rates - How can we track and store failures, categorize them, and determine failure rates for commonly occurring bugs? This may help drive the importance of solving certain bugs.
5. Reporting - How can we report or display these failures in a user-friendly manner?
6. Feedback - Once we feel we've addressed certain bugs, what mechanism and criteria (cycles/samples) do we use to verify that?

Student Requirements

Team participant will be required to;

- Sign non-disclosure forms with Arthrex to limit outside disclosure of proprietary information related to supplied camera system.
- Sign agreements that provide Arthrex with access to any intellectual property developed during the project.

Ideal Student Qualifications

- Inventiveness (enjoys building prototypes – a focus on test scripts and data analysis)
- Background in Electrical and Software Engineering principles
- Familiarity or interest in imaging processing techniques and product reliability

Team members will gain an insight into test fixture/script development and making a real impact on product development and reliability improvements in the medical device industry worldwide. This is an opportunity to collaborate with industry engineers, marketing executives, and medical professionals.

Assets Provided by Arthrex

- Arthrex Synergy Camera Controller Unit
- Surgical Instruments and Accessories
- Mentorship and support from experienced engineers

Company Background

Arthrex is a global medical device company and leader in new product development and medical education in orthopedics. With a corporate mission of helping surgeons treat their patients better, Arthrex has pioneered the field of arthroscopy and develops innovative products and surgical procedures to advance minimally invasive orthopedics worldwide.

Website: www.Arthrex.com and www.synergy.arthrex.com