# Arthrex – Surgical Image Recognition

This project is in cooperation and partnership with Arthrex California Technology Inc located in Goleta (within biking distance of campus!). Arthrex Project Lead –John Batikian.

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 developed more than 11,000 innovative products and surgical procedures to advance minimally invasive orthopedics worldwide.

Project Description

Problem Statement
The Arthrex Synergy UHD4 Imaging Platform is the first endoscopic 4K resolution camera system on the market. The console revolutionizes endoscopic visualization and image management, by combining 4K camera heads, LED lighting, image management and integration with an intuitive tablet controller. The console allows for capturing images and videos that are reviewed by the surgeon and shared with the patient at the conclusion of a procedure. The goal of this project is to create a deep learning algorithm for the automatic annotation and/or classification of live streaming surgical video and image captures.
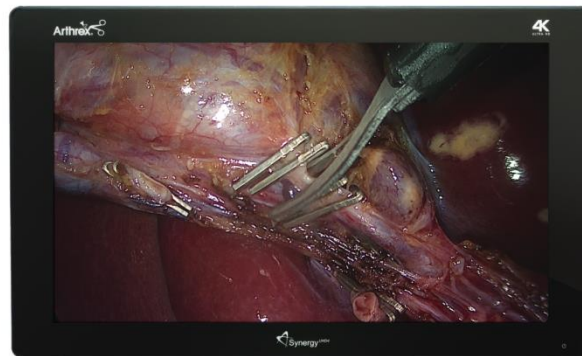
32" UHD 4K Monitor

Objective
The goal of this project is to create an automatic image/video identification or classification mechanism that might be of interest to surgeon during a live surgical procedure. The team will have the freedom to choose a creative application that interests them.

Examples:
-The automatic diagnosis of injured or unhealthy tissue.
-Identification of surgical tool/instrument in the scene.

With the detection or classification application goal in mind, use database of images, provided by Arthrex, to train a neural network. Deploy on an embedded system, like the Nvidia Jetson TX2. Test algorithm on live video and/or captured images from the Arthrex UHD4 camera system to demonstrate the automatic annotated.

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
- Signal and image processing
- Computer Vision
- Algorithm development
- Strong programming skills
- Embedded software

Students interested in the medical imaging industry will find this project interesting and challenging. This is an opportunity to work with industry engineers, marketing executives, and medical professionals.

Assets Provided by Arthrex
- Arthrex Synergy UHD4 Camera Controller Unit
- Nvidia Jetson TX2

Website: www.Arthrex.com