



Arthrex – Augmenting the surgical experience: 3D Device Awareness

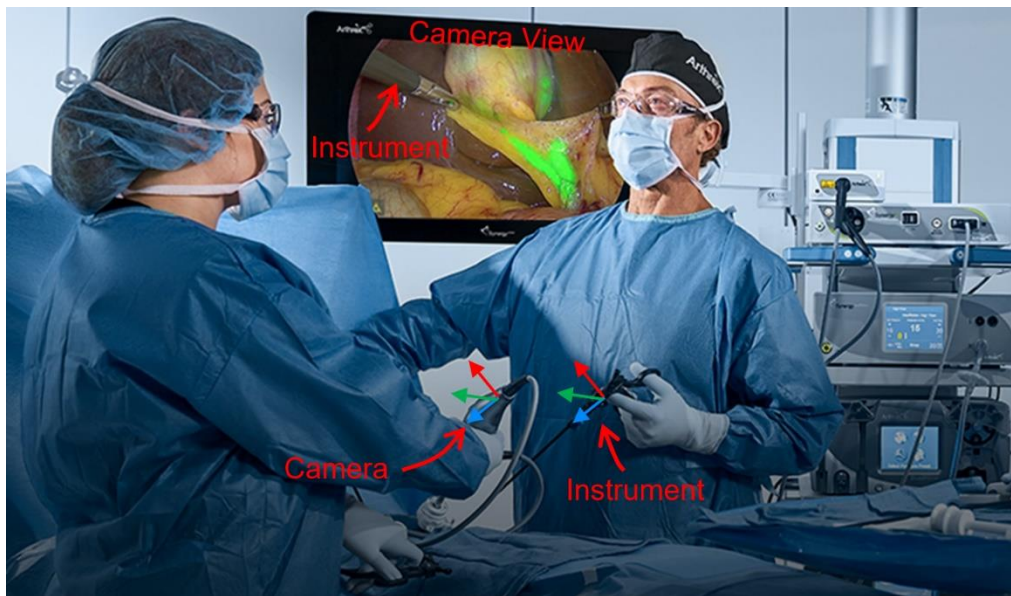
This project is in cooperation and partnership with Arthrex California Technology Inc located in Goleta (within biking distance of campus!). The team will have Arthrex engineers John Batikian and Zach Dominguez for support.

Project Description

Problem Statement

What if you can change the way surgery is accomplished?

Arthroscopy (keyhole surgery) requires surgeons to perform procedures while viewing the surgical cavity on a large display in front of them. Because of this disconnect between what they look at (the display) and where they are working (the patient's joint), it is sometimes difficult to 1) keep track of an instrument's location, particularly if it is behind tissue/anatomy and 2) understand the true size of what they are looking at, since it's magnified so much on a large display. Help us to develop the enabling technology that could solve both these problems!



Objective

The goal of this project is to identify the relative position of an instrument (shaver, drill, hand tool, etc.) to another instrument (endoscopic camera). We would like your help to develop a hardware apparatus that can detect the position and orientation of the instruments relative to each other.

The mechanism must,

1. allow the surgeon to freely articulate the instruments in space



- a. accommodate all possible degrees of freedom that a surgeon might manipulate these devices
 - b. be very low weight
 - c. Avoid any over-center locking conditions
2. not rely completely on a computer vision implementation

While there are some constraints, the design space is wide open for the team to explore.

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)
- Background in Electrical and Mechanical Engineering principles

Team members will gain an insight into working in the medical imaging industry. This is an opportunity to work with industry engineers, marketing executives, and medical professionals.

Assets Provided by Arthrex

- Arthrex Synergy UHD4 Camera Controller Unit
- Surgical Instruments

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.

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.

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