

Abstract

Cardiac catheterization is one of the most common medical procedures performed in many nations to diagnose and treat heart conditions. With heart disease continuously being one of the leading causes of death, many researchers have responded to this crisis, including Biosense Webster. Recently, Biosense Webster altered one of the early-stage production materials within the catheter build. This alteration has affected end-stage performance and resulted in unpredictability. To combat this, the Biosense Webster engineering design team has enlisted the help of a senior design team at the FAMU-FSU College of Engineering to curate a creative solution to ensure stability while utilizing their catheter.

The senior design team is developing a collapsible, yet easily able to be reassembled, testing fixture for the Biosense Webster engineering design team. The team's design is equipped with rigid fasteners to secure down the catheter, a clear acrylic box into which the catheter will be inserted, filled with a liquid that replicates the fluid properties of human blood, and a camera on top of the acrylic box, that is positioned to capture the end of the catheter, which will be used for a motion capture algorithm that detects that angle of the catheter. The catheter is controlled by a stepper motor that rests above the catheter and adjusts the position of the tip of the catheter by connecting it to a tight-fitting mold on the knob of the catheter's handle.

By the project's end, Biosense Webster will be able to safely advertise to practitioners and surgeons that they can safely navigate within the human heart with a 0.5 degree of freedom precision using their cardiac catheter. This will help enforce a safer standard for those receiving heart procedures.