

Project Objective:

Build a measurement device that measures manual inputs on a catheter and evaluates those against a 1:1 promise.

Key Points

- Stepper motor is initiated to begin manual rotation of catheter.
- Camera is placed against the "heart box" to capture distal end movement.
- Captured video is analyzed using image processing and related to the stepper motor action.

Targets

Detect Rotation

- Detect the distal end output rotation and puller wire orientation with an accuracy of 0.5 degrees.

Reproducibility

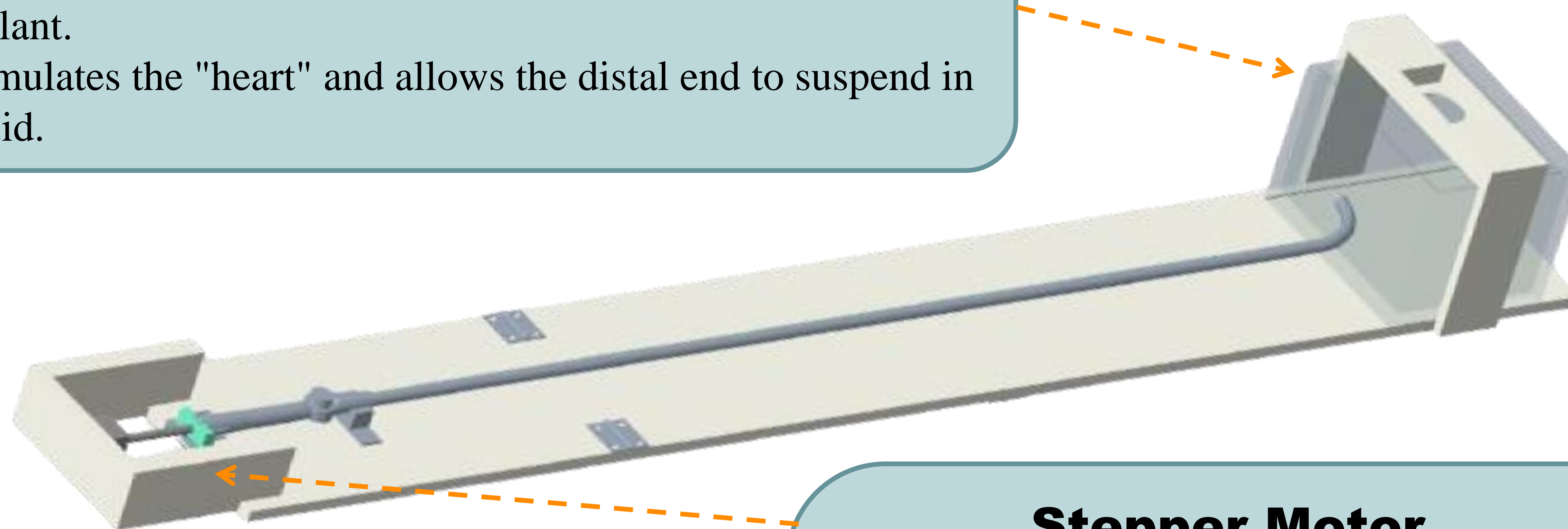
- Can be replicated at the Johnson & Johnson engineering facilities.

Stabilization

- Made of plastic to ensure a firm foundation to test within.

Heart Box

- Manufactured with acrylic and sealed with aquarium grade sealant.
- Simulates the "heart" and allows the distal end to suspend in fluid.



Stepper Motor

Knob Mount

- Stepper motor fastens to a mold that is secured around of the handle of the catheter that supplies movement to the distal end output.

Operation

- A 12V power supply and the student's laptop operate the Arduino and stepper motor.

Image Processing

- Image captures of the tip of catheter rotation and is simulated in MATLAB. The code tracks the angle which the distal end is experiencing at a moment in time.

