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## Abstract

Aerobatic pilots have trouble visualizing their routines from a viewer's perspective and figuring out which actions they perform result in a successful flight. Our team's solution is an in-flight recording system. After a flight, the pilot can watch the recording back to learn what inputs caused which outputs and improve their abilities. This project was

proposed by our client, Dr. Kenneth Sebesta, who flies an aerobatic plane himself! In order to record the flight, we need to know the plane's position and orientation, as well as the pilot's inputs and the plane's response. We created a cyber-physical system that uses a GPS, IMU (accelerometer & gyroscope), and a camera along with a microcontroller to record the flight. The camera uses an image processing system to read the dashboard dial information and the pilot's maneuvers.

After the processing is done, a flight visualization application displays a 3D animation alongside the data values.