

X – FADE: Flight Simulator Chair

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Background

Due to high operational costs of real airplanes, flight simulators have gained popularity for pilot trainees as well as average enthusiasts. Most existing flight simulators have two or three degrees of freedom of motion and use a combination of computer monitors to display graphics in front of the user. Our flight simulator takes the experience to another level, providing the user with a more realistic and immersive experience of what it feels like to fly a plane through the use of virtual reality goggles.

Project Goal

Our goal is to accurately simulate the flying experience by using virtual reality goggles and a dynamic control law that regulates air flow to two pneumatic pistons - one for pitch and one for roll motion to mimic the acceleration forces felt in an airplane. We will also integrate rudder pedals, a weight sensor in the seat, and user-defined gain in order to adjust the response of the system based on the user's preferences.

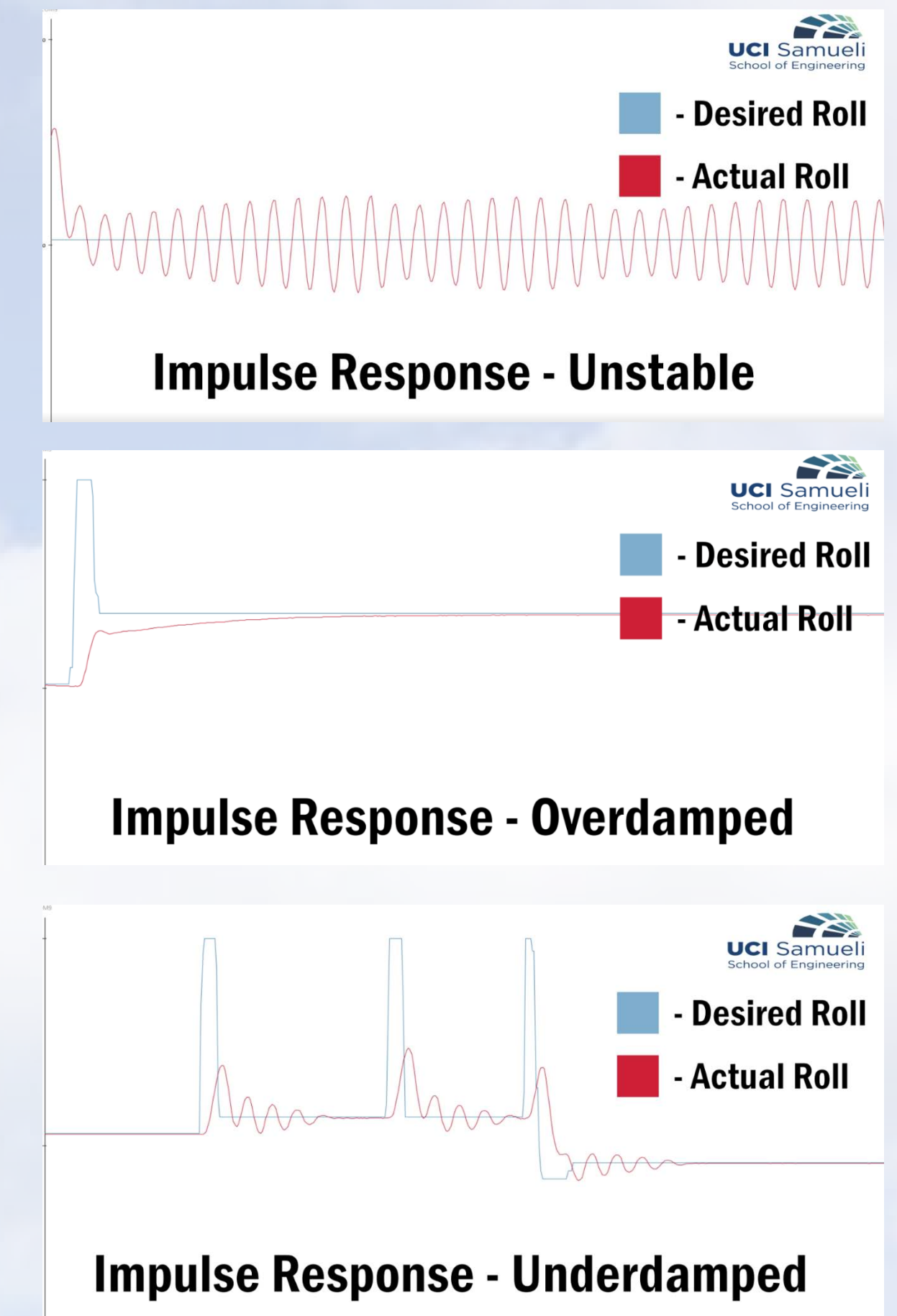
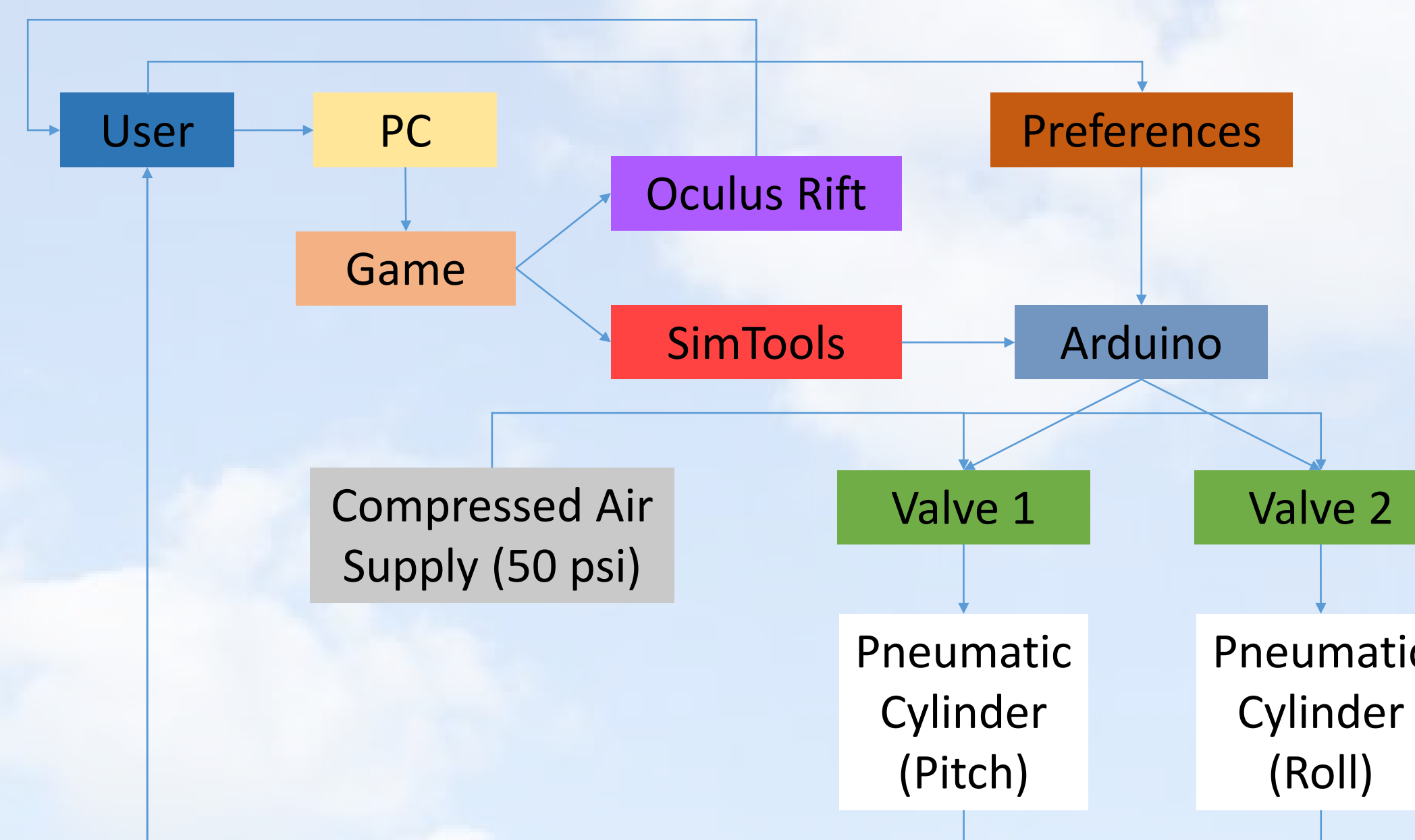
Objectives

- Integrate Oculus Rift headset and infrared camera
- Improve response-time of system with improved control law
- Make user-friendly
 - Simple startup/shutdown procedure
 - Ease of manipulating gain



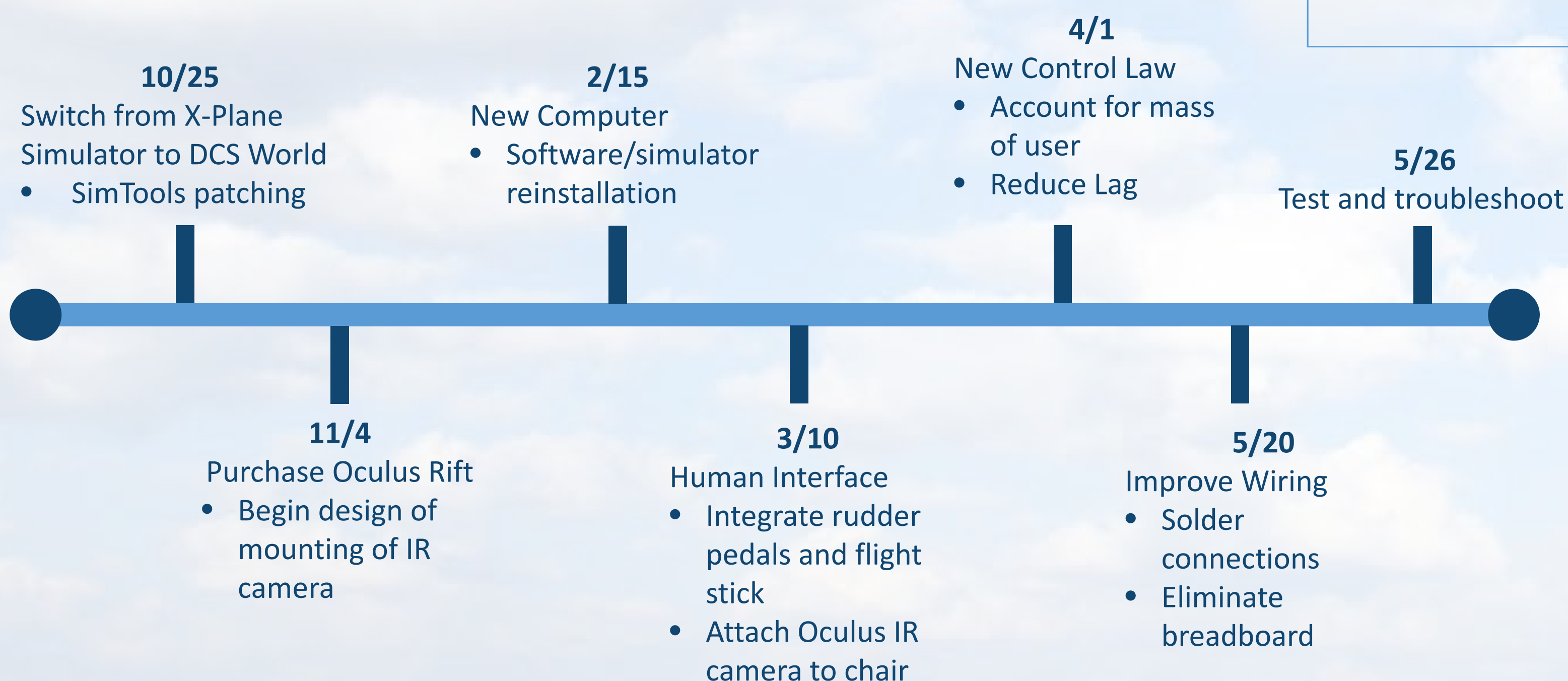
The Oculus Rift goggles provide a very realistic and immersive experience for the user.

Controls

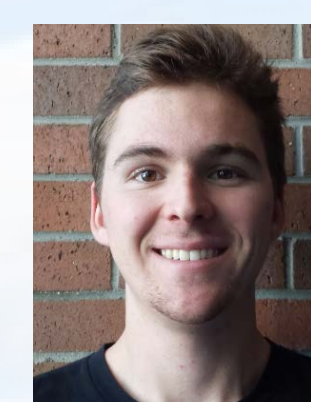


Under different gain settings, the chair behaves differently. Our goal is to avoid these situations and have a quick response time, while remaining stable.

Project Timeline



Team Structure



McHenry Carlson
Team Manager

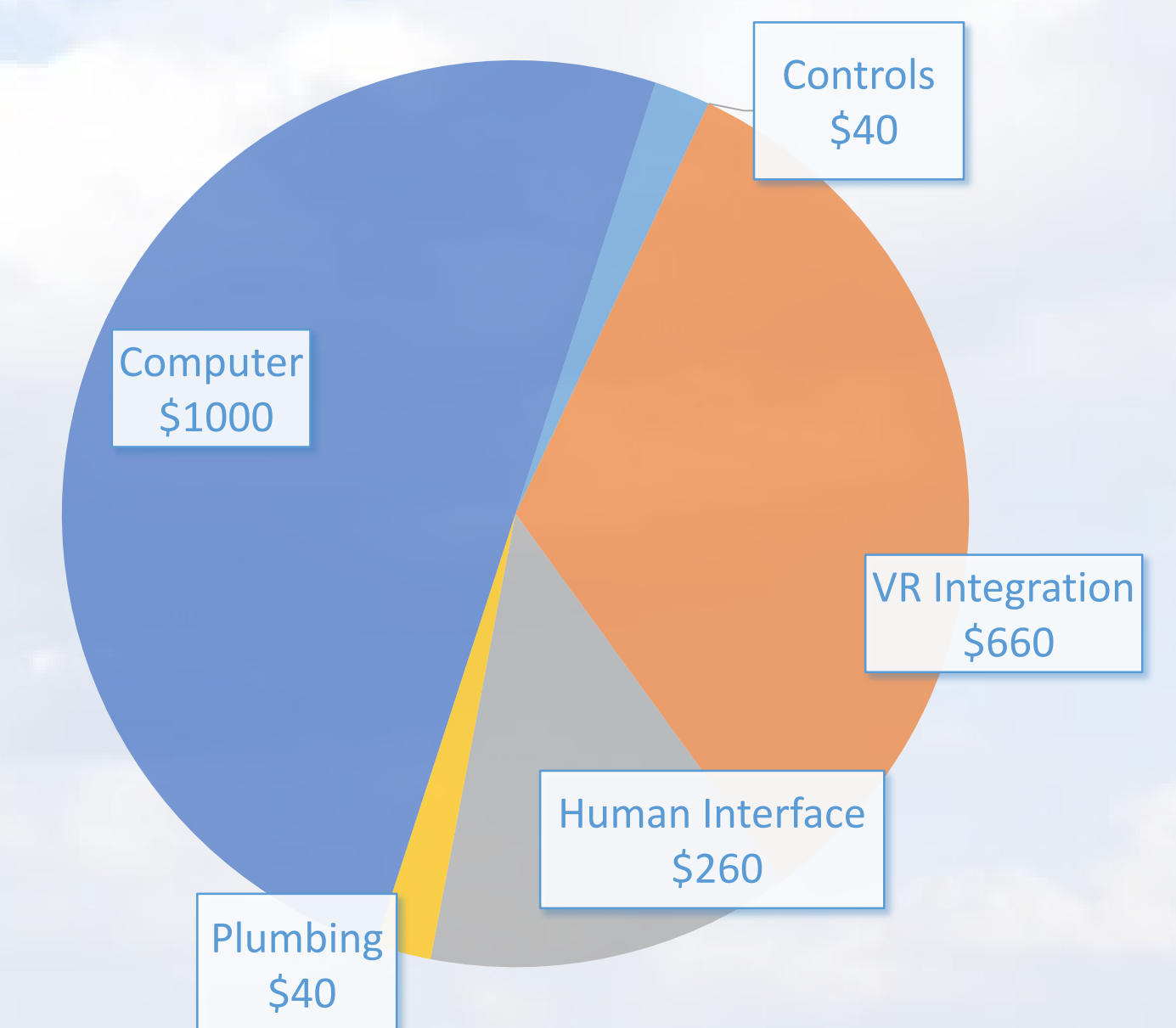


Matthew Gutierrez
Safety Officer



Ethan Peng
Documentation Manager

ESTIMATED BUDGET: \$2000



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