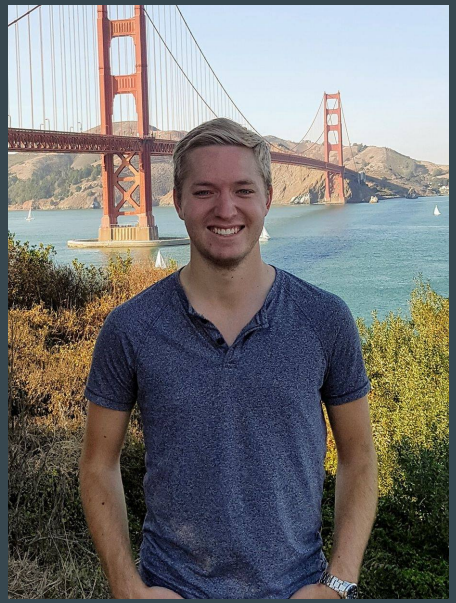
Capstone Project Proposal

Semester 7
Electronic Systems Engineering (B.Eng)
Class of 2018

Team

Stanislav Rashevskyi



David Eelman

Thomas Abdallah

Overview

1. Project Description
2. Project Motivation
3. Project Scope & Engineering Design
4. Project Plan
5. Project Risks
6. Early Development

Project Description

- What are we designing?
- What is it?
- Existing Solutions?

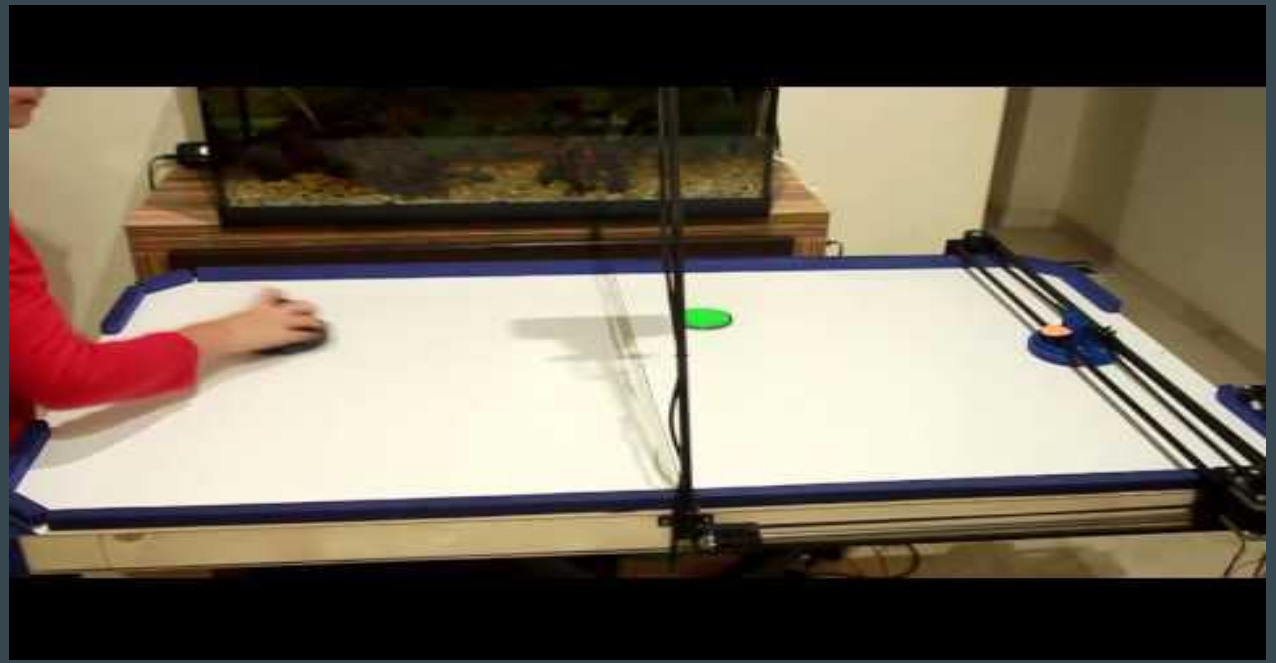
➔ Robotic Air Hockey System

➔ Robotic system capable of playing air hockey against a human player

➔ Just in a moment...

Project Description

Existing solution: Air Hockey Robot by JJROBOTS



Project Motivation

- Why?
  - Opportunity to connect all technical knowledge learned in **ESE**
  - Challenge ourselves to obtain new engineering skills
  - Create robot that will let players practice air hockey alone
  - Apply industry relevant technologies to a fun project

Project Motivation

- Why?
  - Opportunity to connect all technical knowledge learned in **ESE**
  - Challenge ourselves to obtain new engineering skills
  - Create robot that will let players practice air hockey alone
  - Apply industry relevant technologies to a fun project
  - Increase **ESE** program exposure

Project Scope & Engineering Design

The proposed system will include mechanical, electrical, software, and controls components.

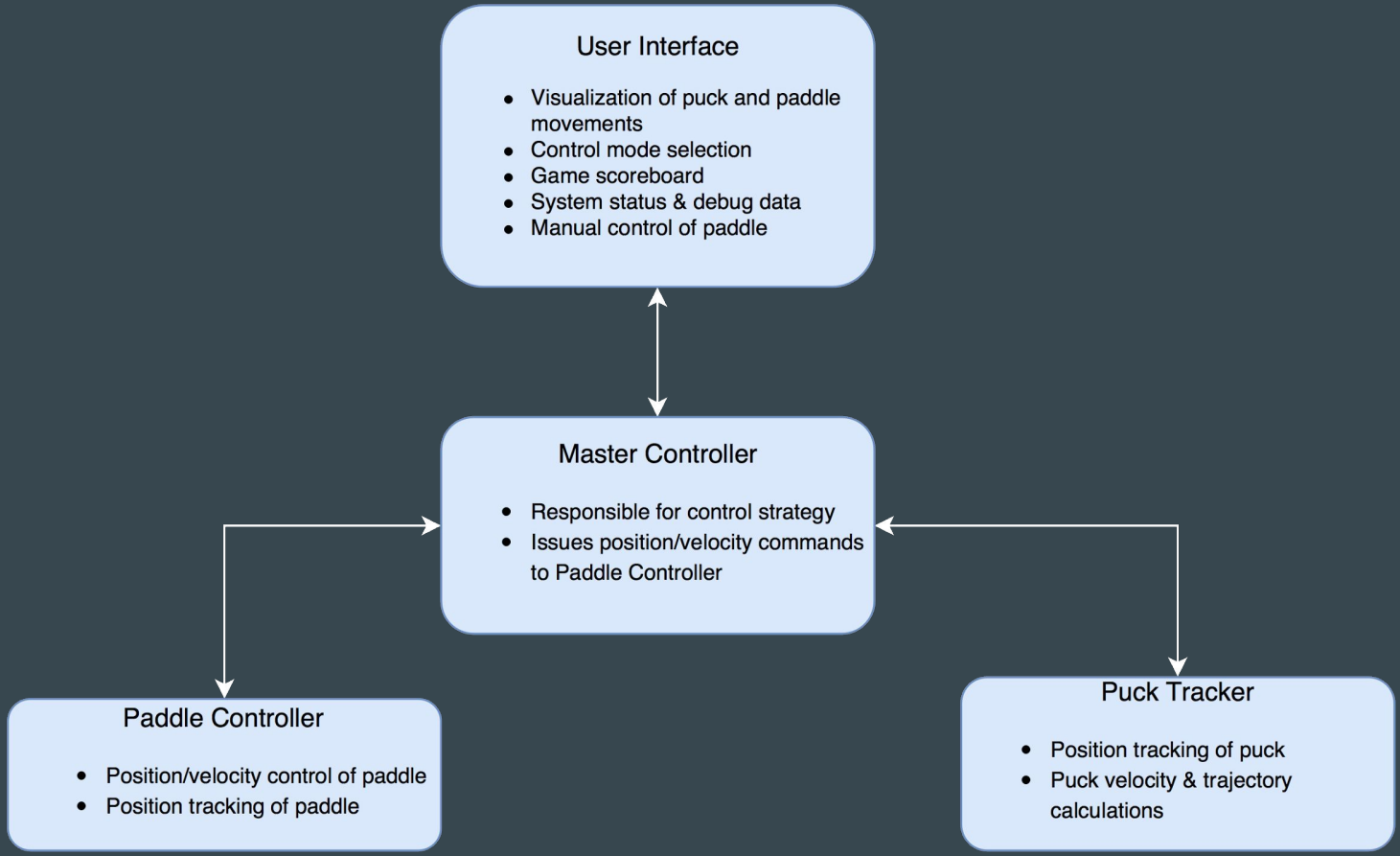
This capstone was inspired by an open-source project and may reference open-source designs, but all work will be our own.

Project Scope & Engineering Design

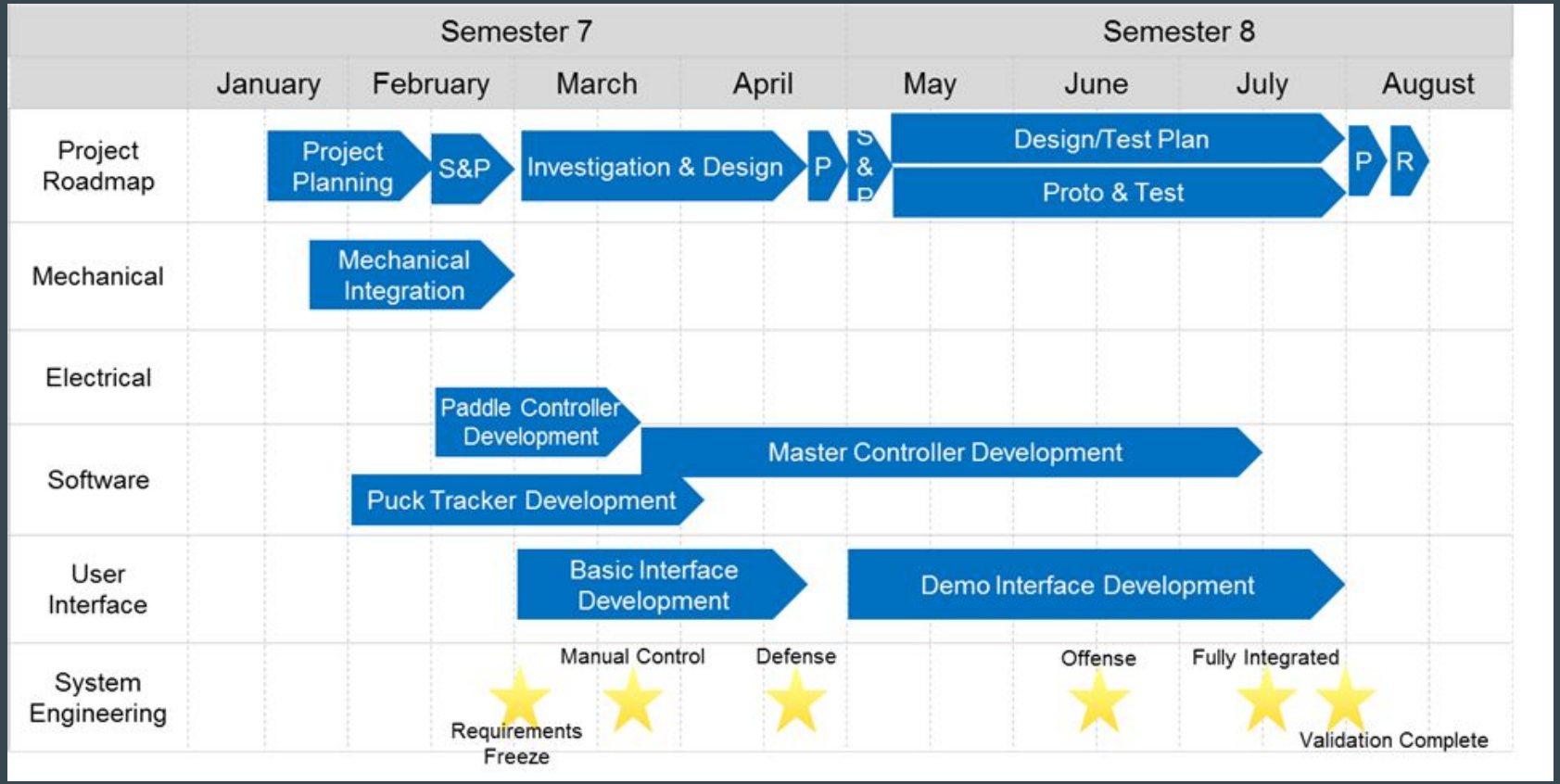
The system will:

- Will have a mechanism for tracking the position of the puck and calculating its speed and trajectory
- Have a mechanical system capable of moving an air hockey paddle in 2D
- Have an electrical system to control the movement of the air hockey paddle (may be implemented using off-the-shelf hardware)
- Have software to control the system (shall be our own)
- Have a UI for demonstrational purposes to both technical and non-technical audiences

Project Scope & Engineering Design



Project Plan

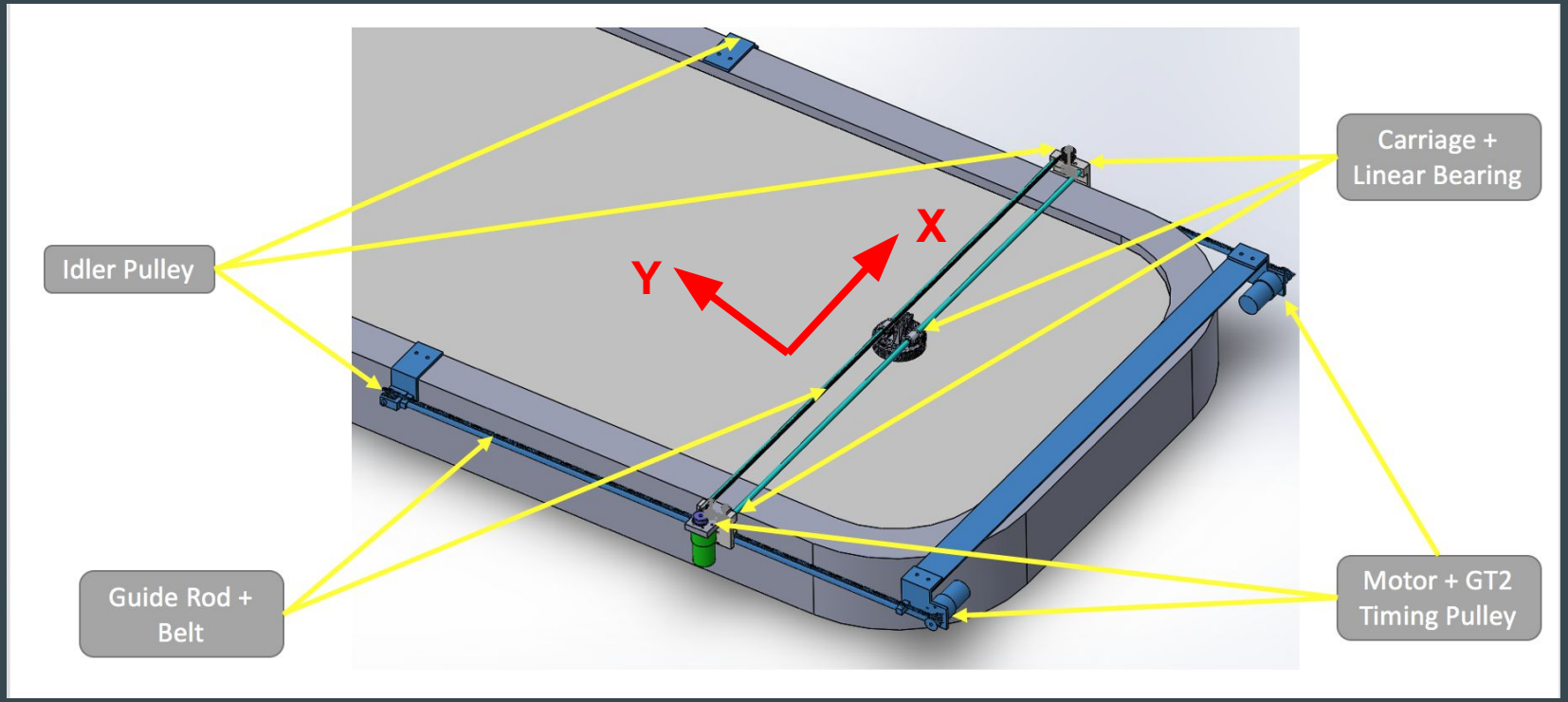


Project Risks

1. Mechanical design/integration problems
2. Real-time object tracking problems
3. Security of project in shared classroom
4. Catastrophic loss of data
5. Managing scope creep
6. System sizing incorrect
7. Inexperience with HMI design & implementation

Early Development

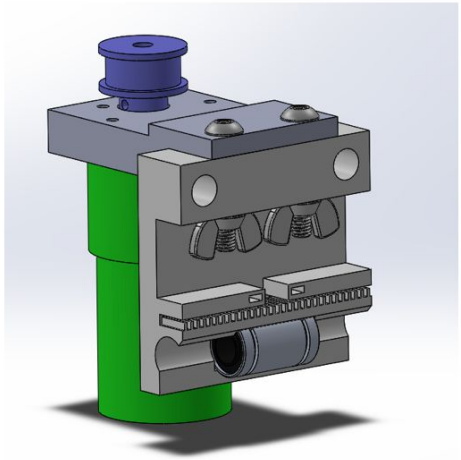
Mechanical system prototype in Solidworks



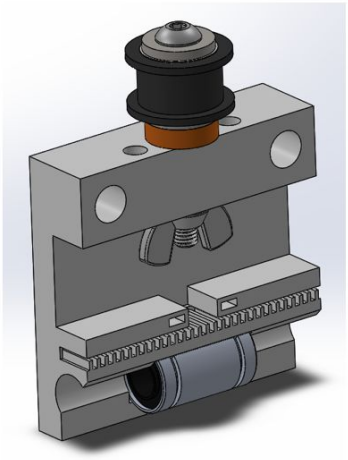
Early Development

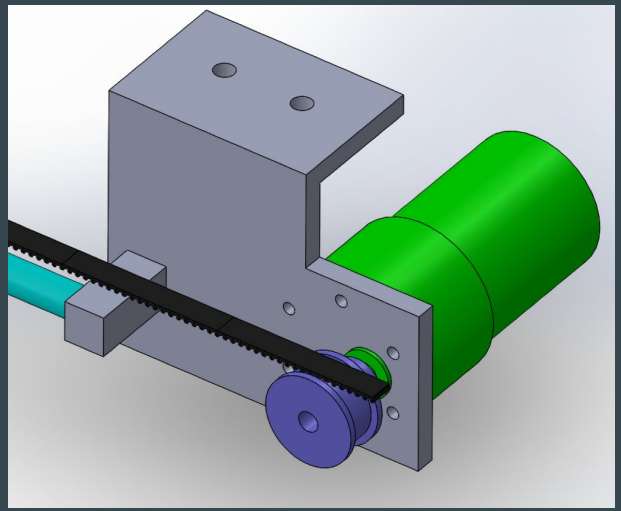
Mechanical system prototype in Solidworks

Motor Assembly



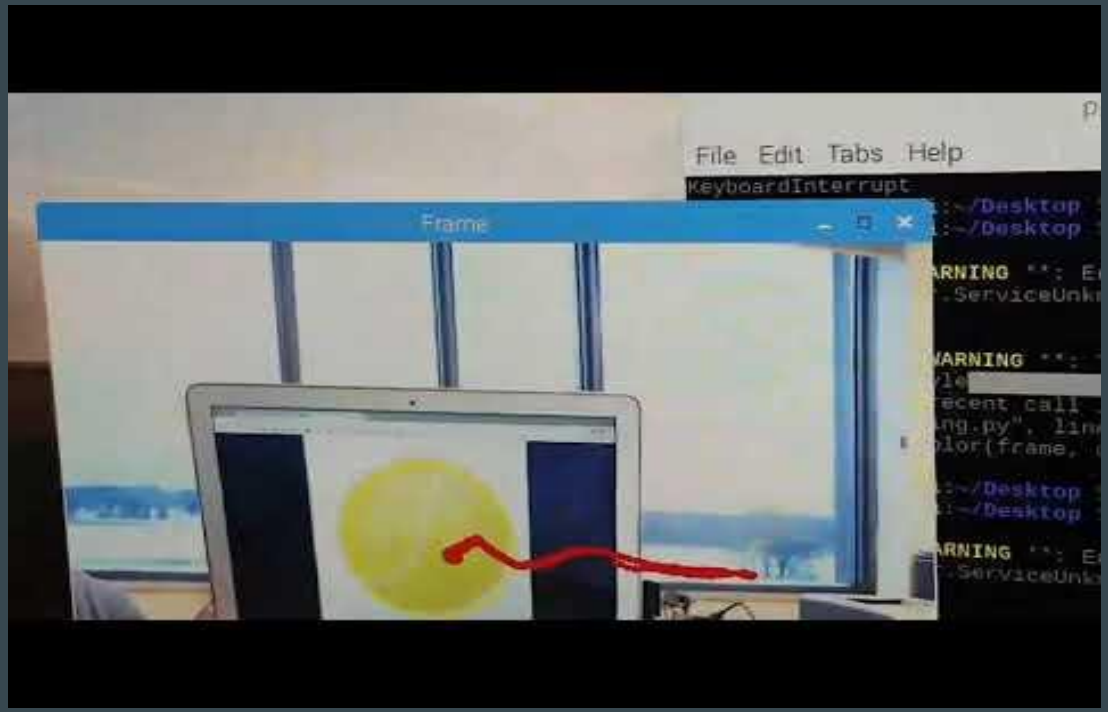
Idler Pulley Assembly





Early Development

Basic puck tracking using OpenCV



THANK YOU FOR YOUR ATTENTION

ANY QUESTIONS?