

MECHTRON 4TB6 - Mechatronics Capstone Projects

**Goals (Revision 0)**

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# Document Purpose

The purpose of this document is provide an overview of the goals of this project. This includes the overall project objective, a list of goals that must be fulfilled, and a list of extended goals the will be worked on provided the initial goals are reached.

# Objective

The objective of this project is to create a small scale physical system capable of replicating motions within a racing video game used as a representation of a full size system. The system will interface with a video game being played by the user. Vehicle motion within the game will be translated in real time to mechanical movements that reflect the forces an individual within the car would feel. This project will use theory and apply knowledge of PID controllers, motor control, wiring diagrams, and real-time sensing.

# Goals

Our primary objective is to build a physical system that can simulate motions in a video game. The main idea behind this project is to create an affordable, small-scale proof of concept for a full-scale racing simulator.

1. Interface with game
   * The system created will be able to extract data from a specified racing video game.
2. Simulate forces in game
   * The system will translate and rotate a platform based on how the user controls the vehicle within the video game.
   * Forces involved in acceleration, deceleration, turning, and crashing the car will be represented by the platform’s motions as they happen in the video game.
3. Be accurate
   * The system will be able to accurately simulate the forces experienced on the driver in real time.
4. Portable
5. Compact
6. Cost effective.
   * The project will be completed within the defined budget of $750.
   * More economic decisions will be made whenever possible.
7. Finished in time
   * The project will be completed by the determined deadline.
8. Neat Code
   * The code must be easy to read and proficient.

# Extended Goals

1. Simulate multiple racing games on the system.
2. Support flight simulation on the system.