# Assignment 7: Bicycle Model Control

Mar. 24<sup>th</sup>, 2020

## Objectives

- To understand the state and inputs of a kinematic bicycle model
- To know how to compute control inputs for a desired bicycle model trajectory

In this assignment, you are provided with a kinematic bicycle model describing the differential equations of motion for a given vehicle, as well as its control inputs. You will discretize these equations of motion, and use them to generate trajectories for the vehicle.

## Resources and Instructions

There are 2 TODO sections to complete in the given Jupyter notebook:

1. Implement the step() function for the bicycle model according to the given equations of motion.

2. Compute the required control inputs that cause the bicycle model to follow a specified figure 8 trajectory.

## Deliverables

HTML output: In the Jupyter Notebook, go to File > Download as > HTML (.html).
Submit a ZIP file containing the HTML output and the PDF file.

**Run all code blocks before downloading the HTML.**

Please follow the naming convention for your zip file: a7_<user_id>.zip .

## Due Date

11:59 PM, Wednesday Mar. 31<sup>st</sup>, 2020.
No late submissions will be accepted. There will be no extensions.

## Marking Scheme

Assignments are marked on a 0-5 point scale.

You will be given 2 points for correctly implementing the step() function. You will be given 3 points for correctly generating the figure 8 trajectory. The figure 8 trajectory doesn't have to be perfect, but it should be quite close. You must zip the html file or the images will not display on Learn.

# Policies

### Collaboration
You can discuss the problem with peers, but you must design and implement your own solution independently.

### Use of online resources
You may consult online resources for inspiration, but you must develop your own code.