

# Project 1 Wrapper

CS 3600 - Spring 2021

Due February 17<sup>th</sup> 2021 at 11:59pm via Gradescope

This Project Wrapper is composed of 4 questions, each worth 1 point. Please limit your responses to a maximum of 200 words.

The focus of this assignment is to train your ability to reason through the consequences and ethical implications of computational intelligence, therefore do not focus on getting "the right answer", but rather on demonstrating that you are able to consider the impacts of your designs.

## Context

Consider a map of all the roads in a city. A driver in this city is using a GPS app which locates the user's position on the map, and uses a A\* implementation to identify an optimum route to the driver's destination using an admissible and consistent heuristic. Considering the intersections between roads as states and the roads connecting states as edges / possible actions, answer the following questions.

## Question 1

In the Romania example in class we considered the length of roads to be the edge cost between vertices (cities), and the optimality of the route was respective to the shortest distance a car would actually have to travel by following roads. How might we account for speed limits? How might we account for traffic conditions if we know that traffic is flowing slower than the speed limit?

## Question 2

Cities are designed with a few major roads and a lot of smaller roads. Sometimes the shortest route between two places is through a neighborhood. Suppose there is a neighborhood in between two very popular destinations where a lot of children live and could be playing in the streets, and A\* has been routing cars through the neighborhood. As more people use GPS-based routing services,

the neighborhood has started seeing an increase in cars cutting through dangerously fast. Suppose we wanted to discourage A\* from routing cars through the neighborhood. What would happen if we artificially adjusted the speed limit on roads in the neighborhood versus if we artificially increased the heuristic values of intersections in the neighborhood? Would either guarantee cars never cut through the neighborhood? Would either keep people who live in the neighborhood from generating routes to and from their homes?

### **Question 3**

There is currently a big societal concern regarding artificial intelligence and automation affecting jobs. How do routing systems impact jobs? Is their impact mainly positive or mainly negative?

### **Question 4**

Reliance on artificial intelligence systems can change human behavior in unanticipated ways. Describe one way in which a routing system can have an undesirable impact on human behavior.