Road Model with a Zebra Crossing and a Bus Stop

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Abstract

This paper will discuss the scenario of a zebra crossing where the traffic stops for a person standing at the edge of the road to let him cross the road and then move on. It will also discuss how a single road having a bus stop can create traffic problem. The study of the model will investigate the dependencies of various agents, which are a car, a bus, a passenger waiting at the bus stop and a person waiting at the zebra crossing to cross the road. A critique of how EM application approach has advantages over the other modelling tools is also discussed.

1 Introduction

In everyday life we come across the scenarios such as waiting at a zebra crossing because the person crossing the road might already have crossed and the person in the car has to wait for the green light or on a single lane road having to queue behind a bus because of a bus stop.

A very similar model of the road system with observables and dependency from the model will be studied by using key principles of Empirical Modelling (Beynon, 2001). The aim of this paper is to critique Empirical Modelling and its tools with traditional methods of modelling. The conclusion of the paper will show how the model can be studied and what new dependencies can be added later on.

2 Motivation

The idea of building this particular model comes from an experience where one day at the zebra crossing, after crossing the road the signal turned read and the cars had to wait for it to turn green. Soon it became a model of interesting dependencies.

2.1 Related Models

The first thing to build a model is to study any related models which are already built on similar concepts. Currently in the University of Warwick, Computer Science department has a databank of all the past models which can be accessed to refer to. The models which helped in building the particular model were trafficlightMendis1997 (Mendis, 1997) and roadtrafficStein2005 (Stein, 2005). These mod-els helped to understand how the individual dependencies affect the working of the model.
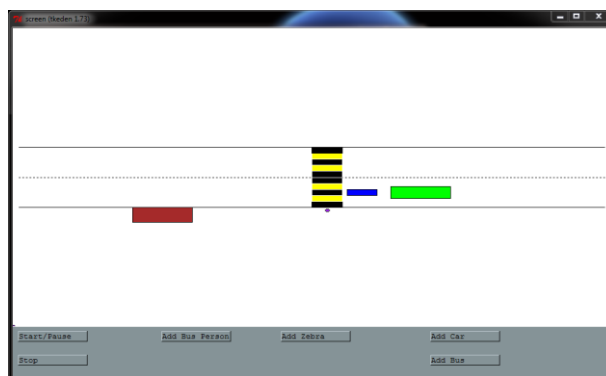
3 The Model

Figure 1 – zebra crossing

As explained earlier the model is about a road having zebra crossing and a bus stop. Figure-1 shows the model; here the round dots represent the pedestrian and passenger. The small rectangle is a representation of a car followed by the big rectangle which is the bus. The pedestrians use the zebra crossing in the event of crossing the road, while the pedestrians crosses the road the approaching car or the bus will stop before the zebra crossing to let him cross over. Apart from zebra crossing there is a bus stop after it which is used to board the bus. When a bus sees a passenger at the stop he stops the bus to let him board the bus. During this event if there is a car following the bus it will stop behind the bus to avoid collision.

4 Working

The simulation starts with the mouse click of the start button, an already moving bus is just seen disappearing from the window. There are other buttons to add a passenger at the bus stop, add a pedestrian at zebra crossing, adding a bus at start or adding a car at the start. The car, bus, passenger and the pedestrian are all individual objects and agents with dependencies. The car and bus maintain a distance from each other all the time, whether they are moving or stopping.

5 Conclusion

In past few years development of EM has given many advantages. Eden provides a very flexible and interactive edge over the traditional method of simulation or object oriented approach. Many useful models have been developed using the EM concepts.

The tkeden provides much useful functionality to make the model more interactive through the interactions with the user. A user can experience dependency and explore the modelling environment to its very depth.

The EM models depict a critical view of many real life simulations which can help in understanding them in detail. Similar approach can be taken before actual implementation of any model in the real life so that it can have the best result after understanding the actual working of these models and which can help in readjusting or changing some aspects.

Acknowledgements

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