Project Specifications
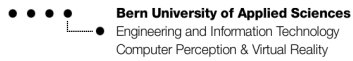
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ischc2: Christoph Isch

Module: Projektarbeit 2 (7302r)
Professor: Prof. Dr. Jürgen Eckerle

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1 Disposition

1.1 Problem description

Our task is to implement an event driven traffic simulation based upon a driver model, an environmental model and a vehicle model.

We have to provide models and simulate street traffic. The simulation is divided in three models:

1. Environmental Model

2. Driver Model

3. Vehicle Model

The environmental and vehicle models have been mostly implemented already in our work in module 7301r. This project is based on that work.
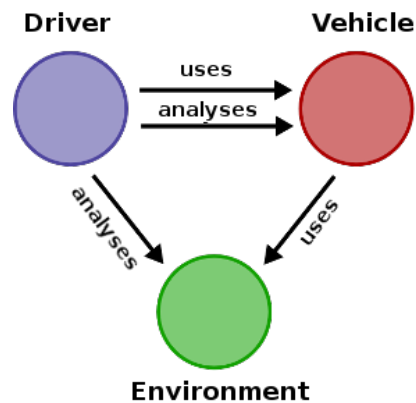
1.2 Objectives

1.2.1 Driver model

Create a parameterised driver model to be able to implement different driver characters. These characters will be able to drive around autonomously and make decisions based on the circumstances that they see and will be influenced by parameters such as "riskyness" and temperament or drug intake. We are trying to achieve a high complexity in this field.

The driver action cycle is divided in four sub parts:

- **Environment recognition**
  The driver looks at the environment with a certain field of view (given by distance and angle), which may be influenced by other factors like age, soberness and sight. The environment then returns the set of seen objects like junctions, other drivers, road signs generically referred to as "way points" in the defined field of view.

  The following three way point types are to be implemented:

  - Junction way point
  - Moving way point (e.g. other vehicles)

  – Road signs

- **Analysis of the way points**
  Assessment of relevancy of the way points in relation to the driver's current situation.

- **Decision making**
  Based on the relevant way points the driver decides whether to accelerate or break. This decision is influenced by the personality of the driver.

- **Execute the decision**
  The driver influences the vehicle according to his decision.

To achieve a certain degree of realism decisions are executed with a time delay to simulate human response time, which can be parametrised.

We want to achieve the following driving situations, from highest to lowest priority:

1. Driveaway

2. React to speed restrictions

3. Follow another vehicle

4. Drive through a junction

1.2.2 Display

Display the current state of the traffic situation.

1.3 Optional Objectives

- Direction indication of the vehicles

- Obstruction of the view by buildings etc.

1.4 Learning Goals

Creation of an event driven simulation, applying basic principles of AI in the driver model.

2 Organisation

2.1 Used Software

Programming Language	Java 6
IDE	Eclipse
Documentation	LaTeX
Version control	git

2.2 Version control

The version control is done with the free Tool Git[1]. An online repository is hosted on github:
http://github.com/schtibe/Projektarbeit-2-7302

2.3 Involved Persons

Jürgen Eckerle	Professor	juergen.eckerle@bfh.ch
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Christoph Isch	Developer	ischc2@bfh.ch

2.4 Dates

Start: 20.09.2010
End: End of fall term 10/11

3 System Requirements

3.1 Hardware

1. Intel Core 2 Duo

2. 2 GB RAM

3. GFX Card with 128 MB RAM

Depending on the amount of simulated vehicles, the minimal requirements may not be sufficient.

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[1] http://git-scm.com

3.2 Software

1. Java Virtual Machine

4 Results

The final results will be delivered in a zipped file.

4.1 Application

1. Executable jar-file

2. Sourcecode

4.2 Documentation

1. Project Specifications

2. Javadoc

3. Final Report

4. Implementation

5. Set up instructions

All documents and all in-line documentation in code will be written in English.

Version	Date	Comment
1	05.10.10	