Initial Report

team NERD

February 1, 2015

1 Part One:

1.1 Aims and Objectives

To build an interactive system that is capable of simulating and rendering the UK road system, ultimately showing the user how the road system will/might react under different settings. An example benefit of such simulation could be learning fairer settings for the road system. The user should be able to adjust various parameters of the entities in our world model, such as distribution of cars, their types, and the road network itself; number of roads, type of each roads, how they are interconnected, how lanes in a road are interconnected, interaction between roads, and etc. The system aims to model the road network in simulation as a collection of mathematical equation, and cars as entities who can follow the road network in a specified direction and manner, in order to reach its destination. The problems the group has encountered and identified so far while learning about the project domain include; equational representation of roads, interaction between roads, interaction between lanes in the same road, and interaction between lanes in different roads.

1.2 Strategy

The overall strategy for achieving the aim of the project is the use of the programming language Java. Initially there were suggestions for the use of JavaScript, HTML and PHP however due to the time restraints and lack of knowledge from the majority of the group we steered away from this option in choice of Java, which is a mutually known programming language the majority of the group felt comfortable using and had some experience with prior.
There are a number of risks involved with the development of the project, our main concern is with the road development, it involves the most risk and is essential to the success of the project. Therefore in terms of a development cycle it is proposed that we use the Agile project management with a focus on risk management. This involves identifying the risk, responding to the risk and then reviewing the risk. This risk management is reflected in the Table 1 were there is continuous improvement to expose flaws faster with the two intense testing stages.

1.3 The Current Work

To design such a system as a group we believed it best to created a system modelled against the existing UK road network and laws. This can be seen within our initial design of the traffic simulation in Figure 1 which was created based loosely on the Waterloo roundabout seen in Figure 2
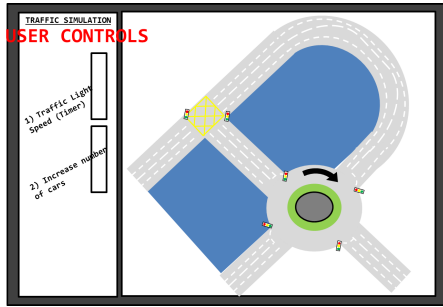

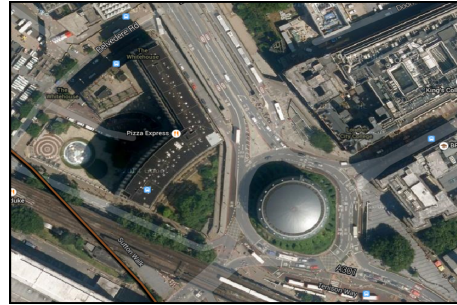Figure 1: GUI Design Development

Figure 2: Waterloo Roundabout

Source: Google Maps

Additionally looking at the UL Highway Code manual helped us identify the Road Marking rules and what they mean to incorporate into our simulation. For example within our initial design Figure 1 is rule 127 about the Centre Line "Do not cross it unless you can see the road is clear and wish to overtake or turn off" and rule 175 about Stop Lines before the traffic lights where you must wait until the traffic light is green.

Overall, thus far we have created a Model-View-Controller structure for the development in Eclipse IDE. We understand that the development of straight roads will be very easy and therefore have been doing research into the development of curved roads using analysis into Bezier Curves which should help us create curved roads and enable cars to move on them to create a roundabout.

2 Part Two:

2.1 Our Team

We have established a number of ways we can work together as a team. A key aspect we distinguished was making sure we to see each other regularly to become familiar with each other to build team relationships. This involves having two weekly meeting on Monday at 3pm and Friday at 1pm, these weekly meetings ensure that we are knowledgeable on the progress of each member in the team at the start and end of the week as well as allowing sub teams whom have been working together to present work to all other members; when crucial deadlines arise emergency meetings on Wednesdays are added. Each meeting is recorded with a log that illustrates those who attended the agenda and outcome of the meeting, these minutes of the meeting are recorded by the project coordinator and emailed to each member with their

Table 1: Project Plan

WBS	Task	Predecessors	Start Date	Deadline	Work Days	Responsible	(%)
1	High Level Planning						
1.1	Look at existing applications		19/01/215	23/01/15	4	all	100
1.2	Clarify the basic function of project		23/01/15	26/01/15	3	all	100
1.3	Create initial UML design ideas of system	1.1	19/01/15	23/01/14	4	all	25
1.4	Determine the programming language	1.1	23/01/15	26/02/15	4	all	100
1.5	Intermediate Report	1.1, 1.2, 1.4	26/01/15	02/02/15	9	all	0
2	Design Stage						
2.1	Discuss work development cycle	1.2	28/01/15	28/02/15	1	all	0
2.2	Create final low level Class Diagram	1.2	26/01/15	30/01/15	3	all	0
2.3	Create GUI designs		02/02/15	06/02/15	4	all	0
3	Development Stage						
3.1	IDE Setup (MVC)		02/02/15	06/02/15	3	Lead Programmer	0
3.2	Road Development	3.1	02/02/15	27/02/15	25		0
3.2.1	Road Mathematics		02/02/15	13/02/15	11		0
3.2.2	Road/Lane Model	3.2.1	02/02/15	13/02/15	11		0
3.2.4	Junction Development	3.2.1	02/02/15	27/03/15	25		0
3.3	Traffic Light Development	3.2	02/02/15	27/03/15	25		0
3.4	Car Development	3.2	16/02/15	27/03/15	11		0
3.5	Testing (PHASE 1)	3.2, 3.3, 3.4	27/02/15	06/03/15	7	Testing Group	0
3.5.2	Quality Assurance	1.2, 3.2, 3.3, 3.5	02/02/15	06/03/15	4		0
3.6	View (GUI) Development		09/02/15	09/03/15	28		0
3.7	Controller (GUI) Development		16/02/15	09/03/15	21		0
3.7.1	User Change Traffic Light Speed		16/02/15	09/03/15	21		0
3.7.2	User Change No. Of Cars.		16/02/15	09/03/15	21		0
3.8	Testing (PHASE 2)	3.2, 3.5, 3.6, 3.7	09/03/15	16/03/15	7	Testing Group	0
3.8.1	Evaluation of Final System	3.8	13/03/15	16/03/15	3		0
3.9	Development of Additional Features	3.8.1	16/03/15	20/03/15	4		0
3.10	Final Report	3.8.1	02/03/15	23/03/15	21	all	0
3.11	Presentation	3.10	23/03/15	23/03/15	1	all	0

designated tasks for the week; additionally for casual communication a Facebook group has been set-up.

2.1.1 Roles

- Project Coordinator/Organizer: Tanda Kabanda
- Lead Programmers: Inyeol Sohn, Jie Ding
- Research/Analysis Leaders: Qiu Yun, Mark Azer

Note: all group members are expected to code when designated tasks by Lead Programmers

2.2 Collaboration

To collaborate with others efficiently, each group member needs to focus on things they are good at. For example, someone may specialise in coding and some one at analysing. It is not a good

idea to force everyone to do same work to purse the so-called 'equal'.

The basic principle of team work is that all group members try their best on the parts they take responsibility for. Hence to achieve above all, group members have to communicate with each other well to show everyone's advantages. Based on that, the team leader could assign different assignments to each member.

The biggest benefit of group work is that you always discuss with partners once you get trouble with something. More people could always figure out some creative thinking by brainstorm.

2.3 Peer Assessment

Peer assessment is being applied in group projects,to show the individual work which based on guidelines in form of rubrics. In this group project,this assessment should based on some objects as below:

1. **Expression of ideas:** Showing how we going to design this traffic system including roads designing, language methods, math functions and so on. This is the main part of group meeting each time, leading us to form the object from nothing to prototype. Each group member has different background, knowledge and most significantly way of thinking which is the core of group work. So communication of ideas toward the project is worth grading.
2. **Organization:** As a team we have a leader as organizer, who separates the jobs based on each members individual ability and creates a timetable as well as coordinate each part of the group work.
3. **Subjects:** In this specific case, means the programming and designing ,algorithms as well as organization.This part should establish how the final work formed and each ones contribution.

The peer assessment should consider objects worth grading and clearly determine each member of the groups contribution to the project.

2.4 Resolving Conflicts

During group projects conflicts are certain to happen when working with others based on the fact that we are 'Humans' and different. Everyone has their own viewpoints, and ways of handling the tasks. It is also important to understand that conflicts can be positive when it encourages group members to listen to each others for a new ideas which may be better for the general interest of a project.

Therefore as a group we have looked at a range of techniques that would be helpful to take into consideration when conflict occurs. It is not about win or lose, correct or wrong, yes or no, it is about negotiating, listening and engaging all members; not excluded members. If needed group members should approach the group coordinator who should must maintain a good relationship with all members to help resolve any group issues and then come to a reasonably negotiation between both parties.

What is important is that every member is respected and conflicts especially petty conflict's which are not specifically to do with work should not take priority. All conflicts should be resolved through discussion and the encouragement of both sides to accept peoples thoughts and opinions and look after the main goal/aims.