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Traffic Control System User Requirements Document

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Background and Context

This user requirements document specifies the software requirements for the "Traffic Control System". This application allows traffic to be simulated with the purpose of noticing traffic jams related to traffic lights.

Definitions and abbreviations

User	The person who is controlling this application.
System	The implementation of this application.
Grid	A place on the screen where a component can be added for the traffic situation.
Component	A visible representation of an object on the screen of the user.
Crossing	A component that can be used in the traffic simulation which has traffic lights.
Traffic light	A component of the crossing which controls the traffic by displaying colors red, yellow green. For which green the traffic is allowed to go.
Pedestrian	A simulation of a pedestrian crossing a road from the traffic light.
Lane	A component that represent a piece of road.
Cars	A component that represent a car on the road.

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1 Requirements

The following chapter describes the functionality that the application has to implement.

1.1 General requirements

Code	Requirement
GEN-010	The program is compatible with Windows 7.
GEN-020	The system allows to design a traffic situation.
GEN-020A	The traffic situation can be designed with the following components <ul style="list-style-type: none"> • Crossroad without pedestrian lane • Crossroad with pedestrian lane • Straight road • Curved road
GEN-020B	All crossroads have sensors for cars and pedestrians, traffic lights don't go green for no cars or pedestrians.
GEN-020C	Components can be rotated.
GEN-025	Components can be dragged onto the grid.
GEN-025A	The grid by default is 4x3 but it is possible to change the size of the grid before adding components.
GEN-030	From the traffic lights of the crossroads it is possible to change the amount of time that traffic light is green.
GEN-040	The system allows simulate traffic in realtime, and allow to change the simulation speed.
GEN-040A	The system can return a report in which it highlight where many traffic jams are in a graphical representation of the traffic situation. Which can be saved as an image file.
GEN-050	The system allows to open and save the traffic situation to a file.
GEN-060	The system allows to specify for each open incoming lane to set the amount of traffic coming.
GEN-200	The sytem will be delivered as a standalone application (.exe file).
GEN-200A	The system design and implementation will also be delivered to the client and has all the rights to it.

1.2 Non functional requirements

Code	Requirement
NFR-010	The system can run on a regular computer/notebook build less than 4 years ago running Windows.
NFR-020	The user interface of the system is straightforward and easy to learn.
NFR-030	The application can be used offline.
NFR-040	The system is stable, and is not allowed to give unclear error messages.
NFR-050	The system is designed to be used with mouse and keyboard.

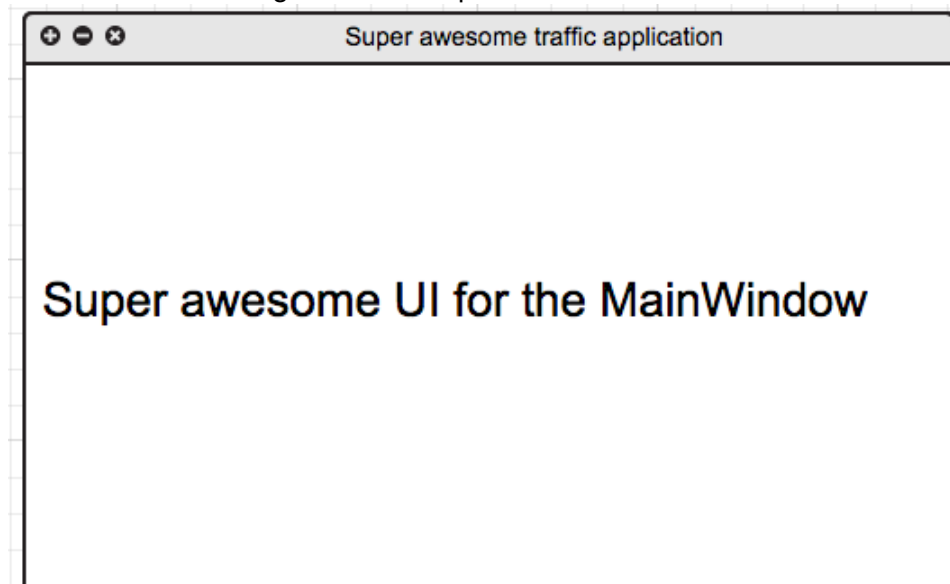
2 Specification

The following chapter describes the implementation of the application.

2.1 Main window

The main window is divided into two parts, see figure 1. On the very top of the application is a menubar where the user can do actions like saving their work. Then the window is split up in two parts. On the left side is the menubar and on the right side the grid. The grid is the representation of the traffic situation. The components (see section 2.2) can be dragged from the sidebar to the grid. To remove a component right-click on it and press on Delete in the context-menu. All open incoming lanes have a text-box which allows the user to specify the amount of traffic coming. The simulation can simply be started by the play button and the simulation speed can simply be changed with a slider. With the button "Show Report" the user can get a report of that moment of the simulation. The report will contain a still image of the current situation. It highlights the traffic jams and the image can be saved.

Figure 1: Mockup of the Main window



Code	Specification
MWS-010	When the application just started it will create a new grid 4x3
MWS-020	The main window has a menubar.
MWS-020A	The menu bar has the following structure: <ul style="list-style-type: none"> • File <ul style="list-style-type: none"> – New – Open – Save – Save As • Help
MWS-020B	A new simulation can be started by pressing on new, a window will prompt for the width and height for the size of the grid.
MWS-020C	The manual can be opened by pressing on Help.
MWS-030	The window has a sidebar on the left.
MWS-032	The sidebar contains all the components described in section 2.2.
MWS-032A	The component can be added to the grid by dragging it to the desired location.
MWS-034	The sidebar contains a button which allows the simulation to start/stop.
MWS-035	The sidebar contains a button which allows the simulation to pause.
MWS-036	The simulation-speed can be changed by adjusting the slider.
MWS-038	In simulation the button "Show report" will generate a report.
MWS-038A	The report is shown in a new window and contains the current traffic situation including cars and pedestrians.
MWS-038B	In the report the traffic jams are highlighted.
MWS-038C	The report can be saved as an image file.

To change the amount of time each traffic light is green press right-click on the crossway and click in the context-menu on "Traffic-light configuration". A new window will pop up which allows to set the time for each group of lanes.

Code	Specification
MWS-100	All open incoming lanes have a textbox to specify the amount of traffic coming in.
MWS-110	When pressing right-click on any component placed on the grid a context-menu appears which allows to rotate or delete the component.
MWS-120	When pressing right-click on a crossway it gives an option "Traffic-light configuration"
MWS-120A	A new window will pop-up with a list of all the lane groups.
MWS-120B	The user can select a lane group and change the amount of time the traffic-light is green.

2.2 Components

3 Use cases