Multimedia system for cars

# Description

The scope of this project is to design and implement a multimedia system for cars that has the following functionalities:

1. Enable navigation;
2. Play audio, video media;
3. Enable voice control.

The design of the project is described using UML use cases diagrams , UML class diagrams and UML sequence diagrams, while for the functionality the QT framework was chosen.

# UML use cases diagrams

## GPS use case

A diagram of gps connection

Description automatically generated

## Media use case

A diagram of a company

Description automatically generated

## Voice control use case

A diagram of a company

Description automatically generated

# UML class diagram

## Design pattern used

For this project the Factory Method Pattern was used.

Also known as Virtual Constructor, the Factory Method is related to the idea on which libraries work: a library uses abstract classes for defining and maintaining relations between objects. One type of responsibility is creating such objects. The library knows when an object needs to be created, but not what kind of object it should create, this being specific to the application using the library.

## Diagram

A diagram of a computer program

Description automatically generated

# UML Sequence Diagram

## General sequence diagram

A diagram of a project

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## Sequence diagrams based on use cases

### GPS

A diagram of a gps connection

Description automatically generated

|  |  |
| --- | --- |
| **Interactions** | **Description** |
| OnClick | Method that treats OnClick events |
| Display | Method that displays activity |
| Initialize GPS | Initialization of GPS module |
| Feedback | Provide feedback |
| Input Destination | Actor destination input |
| Check GPS Connection | Perform necessary checks to confirm GPS connection |
| Calculate route | Calculate best available route based on input and parameters like traffic |
| Provide route | Display the calculated route to the user |

### Media

A diagram of a project

Description automatically generated

|  |  |
| --- | --- |
| **Interactions** | **Description** |
| OnClick | Method that treats OnClick events |
| Display | Method that displays activity |
| Check for external device | Perform necessary checks to confirm the presence of a external device |
| Show available external content | Display the available external content |
| Check for internet connection | Perform necessary checks to confirm internet connection |
| Display internet connection status | Display to the user the internet connection status (connected/disconnected) |
| Input (Search media content) | Provide the input for internet search |
| Process request | Using the provided input search the web |
| Play media | Play the found result |
| Input(Select external media content) | Provide the input for the selection of the external media content |
| Process selection | Perform checks to see if the selected media is available and valid |
| Play media | Play the selected external media |
| Input (Modify volume) | Provide the input for the manipulation of the media volume |
| Lower or Raise volume | Lower or raise the media volume |
| Feedback | Update the UI to display the current media volume |

### Voice Control

A diagram of a control system

Description automatically generated

|  |  |
| --- | --- |
| **Interactions** | **Description** |
| OnClick | Method that treats OnClick events |
| Display | Method that displays activity |
| Feedback | Greet the user with suggestions for voice commands |
| Input (Voice Control) | Provide verbal input for the voice control functionality |
| Compare voice command with DB | Analize the voice input and compare it with a DB of voice commands |
| Command feedback | Provide feedback if the voice command has been recognized or not |
| Process voice command | If the voice command has been recognize execute the command |
| Voice command executed | Provide feedback to the user that the voice command has been executed successfully |

# Application architectureA computer screen shot of a car Description automatically generatedGenerated code

## Files

A screenshot of a computer

Description automatically generated

## Code

A screen shot of a computer program

Description automatically generated

Activity snip

A screen shot of a computer program

Description automatically generated

Activity Factory snip

A screen shot of a computer program

Description automatically generated

GPS (Activity) snip

A screen shot of a computer program

Description automatically generated

Interface snip (GPS)