



Thursday 15th May, 2014

Emergent Architecture Design

Draft Version

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1 Introduction

This document has been written with the goal of providing insight in the architecture design of our software solution. The architecture design will be subjected to change frequently due to the need for additional features or problems encountered with the current design. This document will be updated accordingly when these changes are made.

1.1 Design goals

1.2 Design Goal: Loose Coupling

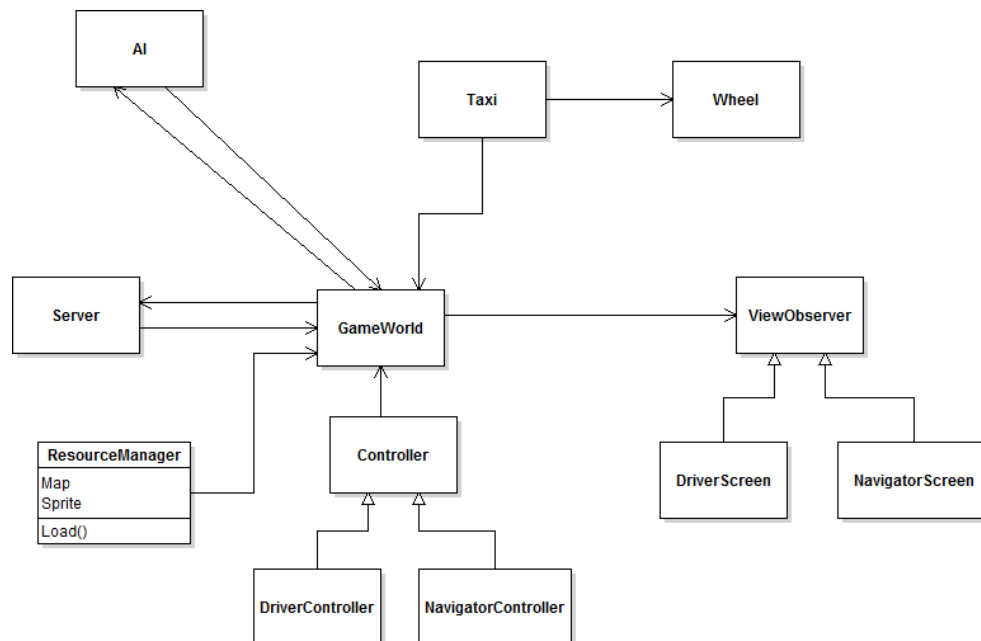
We have divided our classes mostly over two categories: model and view. All classes that represent the game world or objects of the game world are part of the model. All classes that construct a way to view a part of the game world are part of the view category. One of our design goals was to keep coupling between these two categories as loose as possible. This way we can easily make changes to the game world or implement a new view without having to adjust a lot of classes.

1.3 Design goal: Quality Code

We strive for our code to have a certain level of quality. Writing good code makes it easier to expand the working prototype without having to fix emerging errors in the existing code. We want our code to approach the Exemplary Source Code Quality criteria as described in the Software Engineering Rubrics (2014). This implies proper use of design patterns, very few design flaws and proper use of all software engineering principles.

2 Software Architecture Views

2.1 Subsystem Decomposition



The architecture of the system is divided into subsystems. These subsystems are the Game Model, the Driver Interface, the Navigator Interface and the Network Interface. All subsystems will be explained in this section.

The Game Model

The Game Model consists of the game world and all data related to the game. The actual game takes place in this subsystem. All other subsystems are interfaces that are used to alter the game model.

The Driver Interface

This is one of the two interfaces that will be directly used by the players to interact with the Game Model. The Driver Interface enables the user to see the car and its direct surroundings. It also gives the user the means to control the car (steering and acceleration).

The Navigator Interface

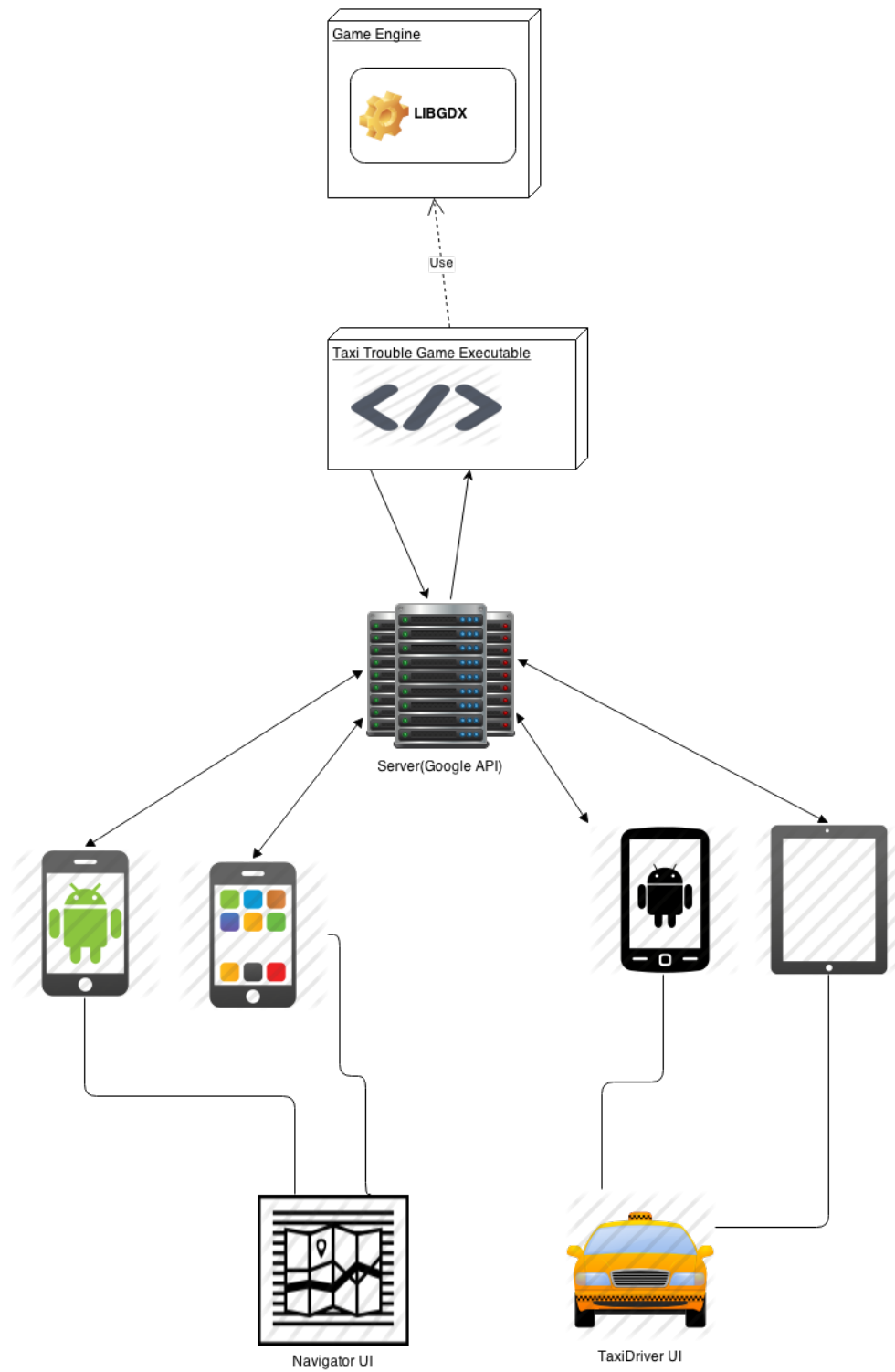
The second way for players to interact with the Game Model is the Navigator Interface. This interface gives the user an overview of the game world in the form of a map. This enables the user of this interface to (verbally) guide the user using the Driver Interface through the game world. The Navigator Interface can be used to interact with the Game Model through the activation of powerups, which will alter specific parts of the game world.

The Network Interface

This interface is used to connect players with each other. It is responsible for the connection of the two players within each team as well as the connection between all the teams. The Network Interface is also responsible for the concurrency between all Game Models.

2.2 Hardware/Software Mapping

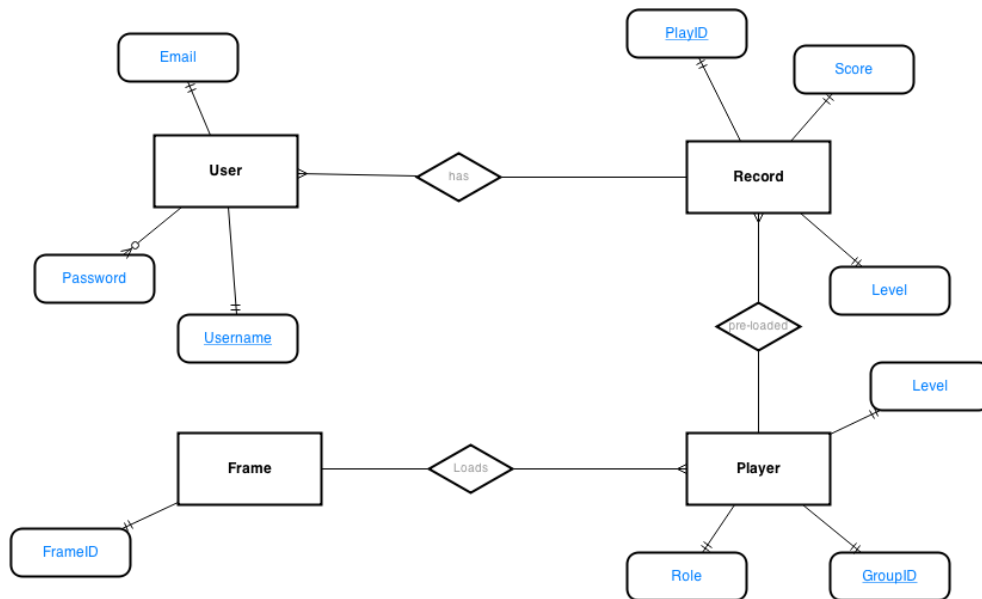
Taxi Trouble is a Real-Time Multi-player game where multiple users can join and interact with game instantaneously using their android devices. The game will start by main menu where User will choose his preferences. If User chooses to have a role as 'Taxi Driver' then Driver view UI is displayed otherwise User gets a latter option as role of 'Navigator' and related UI will be displayed to the user. Since current subsystem design is experiencing its initial phase, there will be more subsystem modification on the next sprints of the project.



2.3 Persistent Data Management

In the below figure a visual model is shown where it describes the data or information aspects of a game domain and its process requirements, in an abstract way that lends itself to ultimately being implemented as a relational database.

Initial design for persistent data management is a basic design for storing user and score information data. This basic design represents very initial idea or relational model and is subject to a massive change. The following represents visual basic ER database model architecture of the game.



3 Glossary

- **Database** : A database is an organized collection of data.
- **Interface** : An interface is a shared boundary across which two separate components of a computer system exchange information. The exchange can be between software, computer hardware, peripheral devices, humans and combinations of these.
- **Prototype** : A prototype is an early sample, model or release of a product built to test a concept or process or to act as a thing to be replicated or learned from.
- **Subsystem Decomposition** :Also known as factoring, refers to the process by which a complex problem or system is broken down into parts that are easier to conceive, understand, program, and maintain.
- **libGDX**: libGDX is a game-development application framework written in the Java programming language with some C and C++ components for performance dependent code.
- **UI** :The user interface, in the industrial design field of human-machine interaction, is the space where interaction between humans and machines occurs.
- **ER** : an entity-relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database.