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Simulation Platform from Data Collection to Impact Assessment of Autonomous Vehicles

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INTRODUCTION

Automated vehicles are expected to bring major changes in the driving task, the mobility patterns and have significant impacts on critical areas such as traffic safety and efficiency or environment Even though, past and present research focuses on specific aspects of automated vehicles, the analysis of their behavior is a holistic approach starting from the data collection either from the vehicle itself or the infrastructure, surveys and social media to understanding, modelling and simulating automated vehicles

OBJECTIVES

The aim of this work is to graphically depict the structure of a platform consisting of all the components illustrating the process from data collection to modelling and impact assessment of automation as well as their interrelations. The proposed developed platform aims to analyze big data collected from AVs through their various sensors combine with the results from surveys and social media posts and therefore to formulate an accepted "driver" behavioural model, integrated in a simulation software for assessing the impact of automation.

UML CLASS DIAGRAM

A class diagram in the Unified Modelling Language (UML) is developed, which graphically represents the static structure of object-oriented systems, which are comprised of the following elements: classes, attributes of classes, methods (operations of classes and relationship among objects. A class constitutes a blueprint for an object. Object-Oriented Design is based on class definition, since objects are created from classes. Classes describe the general type and properties of objects, while objects are usable instances of classes. Classes are represented by rectangular shapes which are partitioned in three sections. The first section includes the class name, the second section shows attributes and their types, while the third one depicts methods and their return types.

SIMULATION PLATFORM

The proposed platform consists of 5 different elements: data, modelling, use cases, simulation platform and impact assessment. In each component, different functions and actions are executed and different data and tools are required.
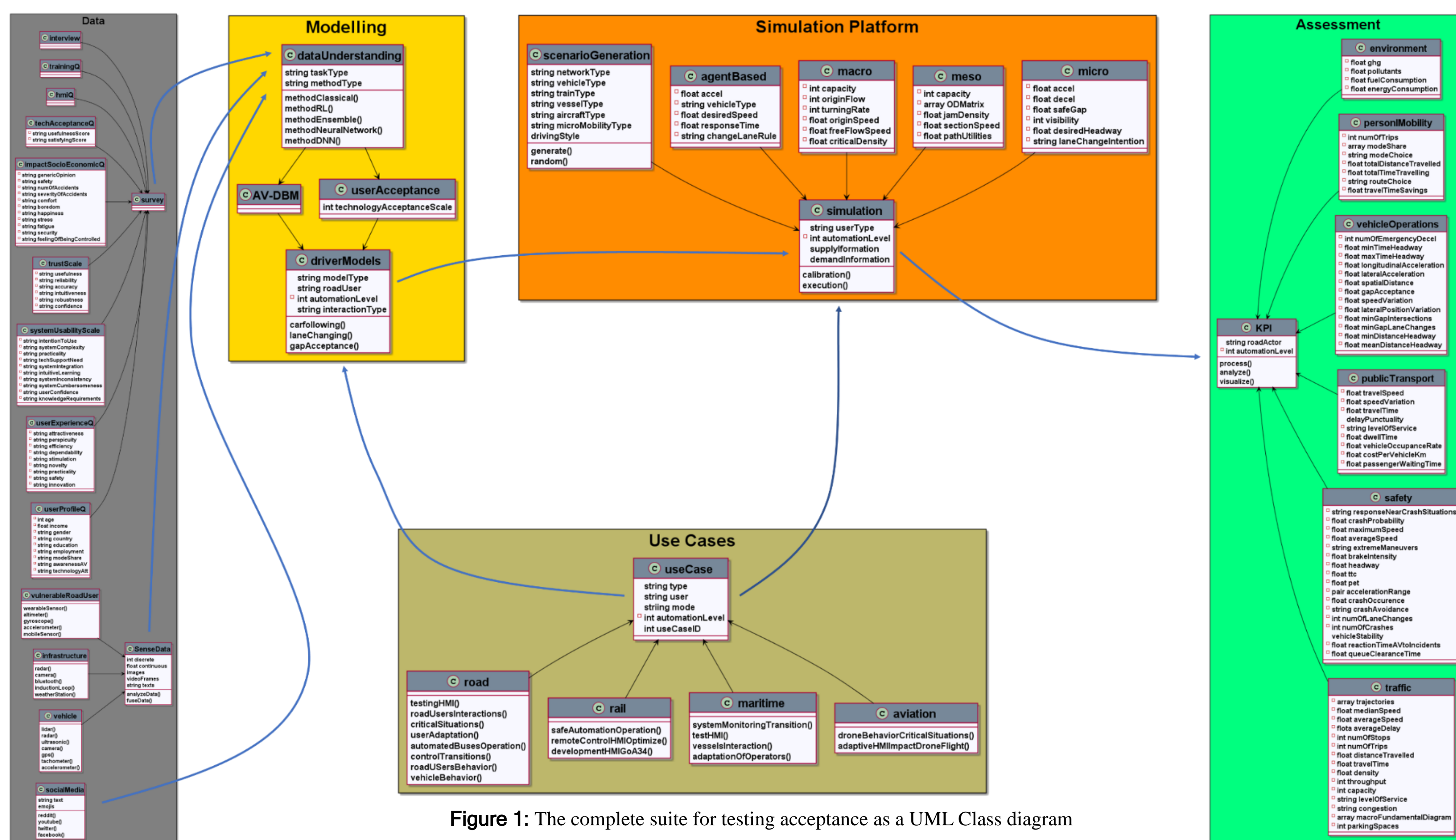

Figure 1: The complete suite for testing acceptance as a UML Class diagram

Acknowledgements

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