Architecture Design

Group: House Gryffindor (1)

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1. Introduction

1.1. Design goals

During the project, several design goals are to be taken into account. Although some of these goals may already be discussed in the former part of the report, all goals will be stated explicitly underneath.

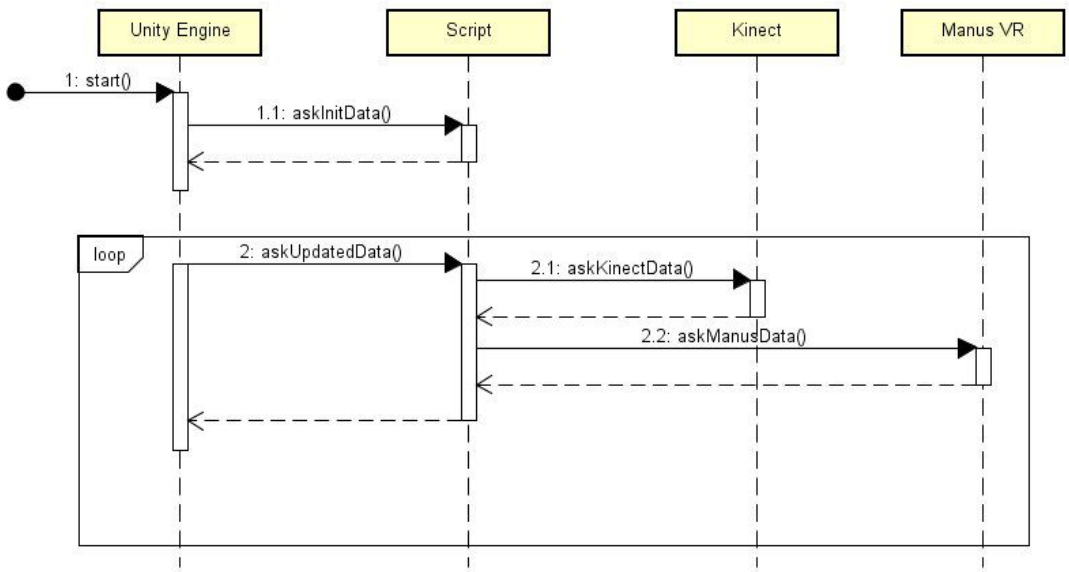
- Performance
  One of the hardware components in the system is the VR HMD. This means that high performance is a necessity. Without a frame-rate of at least 90 FPS, the user can experience dizziness and nausea.

- Reality
  In order to treat patients successfully, objects in the virtual world should behave as they would in real world situations. This means for example that objects cannot fly through other objects. If it would be possible, patients may not be helped at all because of the unreal situations.

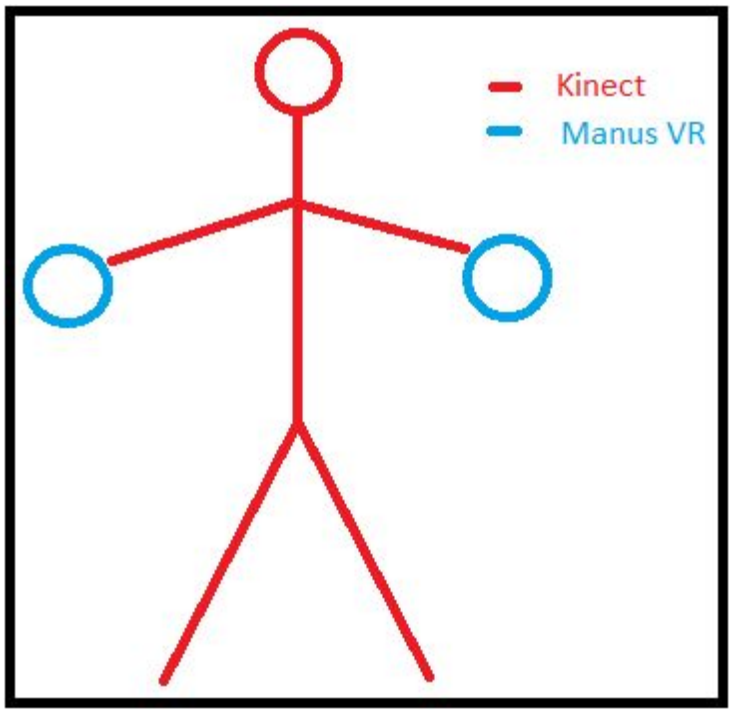
- Scalability
  The setting in which additional functionality is developed is not the scenario in which it eventually will be used. The development environment is a less computationally exhaustive setting, therefore it is crucial that the performance of the system is still acceptable in the final environment.

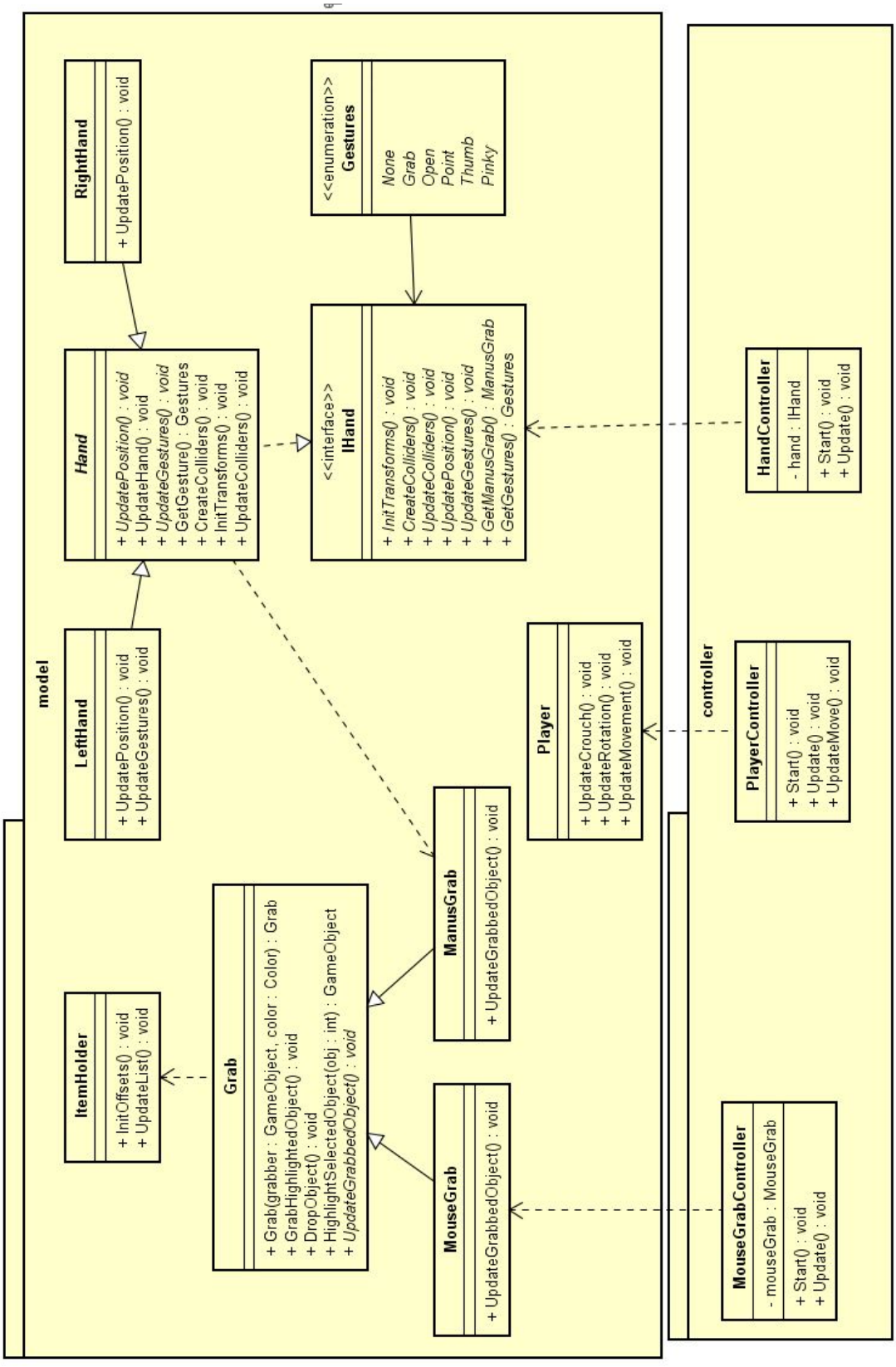
2. Software architecture

The system created so far uses the Kinect and Manus VR hardware. For every frame, the unity engine calls the update function in the different scripts for determining the new positions of the component in the armature.



The above model describes how the different components relate to one another. There are 2 input devices; the Manus VR and the Kinect. Each of them control a different part of the simulated body. In the image below a simple stick figure provides an overview of the body parts and their controllers.





This UML describes how our system look like until now. We have two different grabbing classes. One is for grabbing objects with the Manus, and the other one for grabbing objects with a simple mouse click. And we have an apart class for controlling the player. The hand functions are implemented by using the Inversion Control pattern.