# Design and Requirements

The goal of the project is to develop a virtual 3D racing environment where the difficulty of the opponent racer is dynamically adjusted. We implemented a time trial mode. The goal is to drive a lap as fast as possible. Players are challenged by a “transparent” opponent e.g. ghost car. In traditional race games, the ghost car is a reproduction of your previous runs. We additional introduce the Virtual Rival (\textit{VR}). \textit{VR} is a ghost car adjusted on the players estimated skill level. The skill level is estimated from the players’ previous runs. The trajectory of the \textit{VR} run is taken from a database of runs from all players. Virtual rivals teach and guide while entertain and challenge. Players can improve driving skills in every lap and \textit{VR} improve with them. There are different stockholders involved in this project:

Developers: Developers want to create a challenging environment and improve racing simulations.

Players: Players want *Entertainment* and need *Motivation*.

Analysts: Track the players’ *Motivations*, *Emotions* and *Performances*.

Therefore, different requirements have to be met. The solution should be easy to implement and meet the requirements for all parties. In this chapter we want to set the practical foundation on how to improve \textit{Enjoyment}, \textit{Motivation} and \textit{Performance} in racing simulations based on the groundwork discussed in Chapter~\ref{sec:rel:background}.

Players need an environment that is easy to use and supports competitive racing. To improve *Performance*, the design of the world also focuses on the advantages of completive, balanced environment in comparison of conventional race game approaches. The strength of VR in comparison to traditional systems is potentially increased *Enjoyment*, *Motivation* and *Performance*. Hence the design of the Virtual World concentrates on emphasizing these factors:

Simplicity

The key game creation principle for race simulation design to improve *Enjoyment* discussed in Section~\ref{} are built around a core mechanic, clear objectives and success criteria’s. The focus is on realism and detailed simulation that enhance players driving understanding. The elements should be simple and the goals should be clear.

Competition

In-world competition, such as traditional ghost cars and *VR* raise the players understanding, *Enjoyment* and *Motivation*. Different algorithms such as rating systems enhance the balancing of the competition.

Assessability

Analysts should be able to follow and assess the players’ activities and question answers to measure the actual Performance, *Enjoyment* and *Motivation*.