

# Chapter 9

## Techniques on Multiplatform Movement and Interaction Systems in a Virtual Reality Context for Games

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### **EXECUTIVE SUMMARY**

*When a student works on a VR game design project, the input scheme is often bypassed because it is considered to be one of the easiest things to implement. But should design affect the inputs, or the other way around? The author attempts to solve this with the creation of a unified communication tool among students, academics, and developers. This proposed tool will define which movement and/or interaction technique is best suited, depending on the following factors: platform, constraints, context, physique, space, immersion, and user experience. The game design framework will be described, discussed, and presented in a table format to address all of the above when working on VR games. This chapter will also include a section that will define what the player can do and how.*

### **ORGANIZATION BACKGROUND**

Solent has become a university since July 2005, but it has a long and complex educational history. Incorporated as an independent higher education institution in 1989, the University's origins can be traced back to a private School of Art founded in 1856. Mergers between Southampton College of Art, the College of Technology and the College of Nautical Studies at Warsash has laid the foundations for what is now Southampton Solent University. Since becoming a university, Southampton Solent has helped nearly fifty thousand students from all walks of life to make the most of their potential. Guided by three Vice-Chancellors in turn, the University has changed dramatically over the past ten years – from campus improvements to the state-of-the-art facilities (Solent University, 2018).

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## INTRODUCTION

There is an urgent need to differentiate all the possible movement and interaction systems game development students would have at their disposal to develop a VR game project. That is especially important when students specialized in game development are in the process of completing their Final Major Project (FMP) that intends to define what a game would be, after considering all types of inputs in the design process. Both movement and interaction systems available to game developers would define whether a game could be built as a mobile or a desktop/console game. Those considerations would greatly affect the game design foundation, and, in turn, affect the nature and quantity of features or mechanics in a game design product. The author has been assigned the task by *PacktPub* to develop two online courses to teach VR Development using Unreal Engine (Ntokos & Eleutheriou, 2017). *PacktPub* is a publisher of technology- or developer-oriented technical textbooks. *PacktPub* also develops online courses that require a careful study of system movements and interactions.

## BACKGROUND

As part of the Solent University's curriculum, students will be required to complete a final year project at their last semester of study. Some of them opt to do a VR project which often involves issues of great technical and academic importance. Technically speaking, a significant question is which platform students could choose from to develop their game design project. Academically, the VR project itself could bring a new layer of learning experiences for students that need special consideration before delving into game design or code in the areas of movement and input constraints. These issues as mentioned above are likely to pose many challenges for students, which warrants the proposition of a pedagogical framework to define how a game should be made or constrained by game developers.

## Technological Concerns

The technical concerns to justify this pedagogical chapter to teach game design principles is that the game design process needs a principle-based framework that can be used for a multi-platform context. Depending on the type of game project that students want to complete, there would be several VR techniques needed for each of these game platforms. Students may also need a full access to PC and/or mobile headsets, and even subsequently adjust their own game design projects because of these technological limitations. For example, it might not be practical for students to design a VR game for mobile platforms, with the expectation that all end users always have a mobile-friendly gamepad for interactions. Furthermore, mobile headsets are different from each other. In the mobile context, game developers have frequently relied on *Google Cardboard* (Google, 2014) and *Fibrium* headset (Fibrium Limited, 2017). *Fibrium* headset does not have the hole on the upper right corner to allow a finger to be inserted to tap on the screen. On the other hand, *Google Cardboard* is the cheapest solution for mobile VR and it also allows tapping on screen through a hole.

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