Individual Project (CS3IP16)

Department of Computer Science

University of Reading

Project Initiation Document

## PID Sign-Off

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| **Student No.** | **24015209** |
| **Student Name** | **James Tang** |
| **Email** | [**Xr015209@reading.ac.uk**](mailto:Xr015209@reading.ac.uk) |
| **Degree programme** (BSc CS/BSc IT) | **BSc CS** |
|  |  |
| **Supervisor Name** | **Timothy Threadgold** |
| **Supervisor Signature** |  |
| **Date** |  |

# SECTION 1 – General Information

## Project Identification

|  |  |
| --- | --- |
| **1.1** | **Project ID**  (as in handbook) |
|  | 150 |
| **1.2** | **Project Title** |
|  | Virtual Campus |
| **1.3** | **Briefly describe the main purpose of the project in no more than 25 words** |
|  | Create models of parts of the campus using SketchUp or blender which can be explored using a robot and explored in unity |

## Student Identification

|  |  |
| --- | --- |
| **1.4** | **Student Name(s), Course, Email address(s)**  e.g. Anne Other, BSc CS, a.other@student.reading.ac.uk |
|  | James Tang, BSc CS, xr015209@live.reading.ac.uk |

## Supervisor Identification

|  |  |
| --- | --- |
| **1.5** | **Primary Supervisor Name, Email address**  e.g. Prof Anne Other, a.other@reading.ac.uk |
|  | Timothy Threadgold, timothy.threadgold@reading.ac.uk |
| **1.6** | **Secondary Supervisor Name, Email address**  Only fill in this section if a secondary supervisor has been assigned to your project |
|  |  |

## Company Partner (only complete if there is a company involved)

|  |  |
| --- | --- |
| **1.7** | **Company Name** |
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| **1.8** | **Company Address** |
|  |  |
| **1.9** | **Name, email and phone number of Company Supervisor or Primary Contact** |
|  |  |

# SECTION 2 – Project Description

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| --- | --- |
| **2.1** | **Summarise the background research for the project in about 400 words. You must include references in this section but don’t count them in the word count.** |
|  | The background research I have done for this, I have researched various ways to control how the user would move and view around a virtual space, I primarily used Google Maps Street view, Google Cardboard and Google Earth VR as my background research.  I used Google Cardboard’s Tour guide feature, which my primarily inspiration for voiced guide tours, Google Maps Street views which allows you to explore inside of some buildings on the map gave me inspiration for moving around inside buildings to view what the inside of a building looks like.  Inspiration I got for moving around the map was primarily from watching footage of VR games, where the user just points to a location and teleports to it. |
| **2.2** | **Summarise the project objectives and outputs in about 400 words.** These objectives and outputs should appear as tasks, milestones and deliverables in your project plan. In general, an objective is something you can do and an output is something you produce – one leads to the other. |
|  | The objectives and outputs are:   * Get photos of the campus buildings such as: structures of the building, inside of the building including most of its rooms. This allows for modelling the outside of the building and inside the buildings as well. * Get photos and map of the campus grounds (Half of Whiteknights campus including the lake) to model the outside parts of campus. Once this is done, then the buildings can be successfully placed on the outside areas (Once they are modelled). * Model the buildings using SketchUp, once the buildings have been modelled then use SketchUp again to model the outside areas. * Once both have been completed, use unity to place the buildings and outside map areas together to form the basis of the virtual campus. * Add in voice lines, which reads out loud to the user about information about the current area they are in. * Use unity to code the virtual reality part where users can move around and interact with the environment (such as guided tours, or information about the buildings/area). * Once all is completed, test the virtual reality out and test for bugs/potential problems users may run into. |
| **2.3** | **Initial project specification - list key features and functions of your finished project.** Remember that a specification should not usually propose the solution. For example, your project may require open source datasets so add that to the specification but don’t state how that data-link will be achieved – that comes later. |
|  | * Fully explorable central white knight’s campus, from Chancellor buildings to Halls to the lake. * Users can explore inside of most of the buildings, there is some interactive elements (Mostly buttons users can press which gives out information about the current building that they are in). * Some parts of the buildings can be interacted with. * Guided tours of the campus, users can select one of three tours (May be more in the future) which gives them a personal tour of each part of the campus, with a pre-recorded guide tour.     Figure Purposed plan of explorable area which the virtual campus tour would be like |
| **2.4** | **Describe the social, legal and ethical issues that apply to your project. Does your project require ethical approval?** |
|  | None of that I know of, possible legal issues are required permissions to take pictures of campus and permissions to use information about the campus. |
| **2.5** | **Identify and lists the items you expect to need to purchase for your project. Specify the cost (include VAT and shipping if known) of each item as well as the supplier.** e.g. item 1 name, supplier, cost |
|  | * Vive set, Vive, £599 or Oculus Rift + Touch, Oculus, £499   + Used for Virtual reality testing * Google SketchUp, Google, Free (But may possibly need the pro version, $695) or Blender   + Used to create models of the campus * Unity, Unity, Free (May need to purchase the pro features to access the virtual reality features, in this case it is $125 per a month)   + Used to code in the virtual reality parts |
| **2.6** | **State whether you need access to specific resources within the department or the University e.g. special devices and workshop** |
|  | Need access to virtual reality tools (such as oculus rift or Vive) and a room to test out the virtual reality parts. |

# SECTION 3 – Project Plan

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| **3.1** | **Project Plan**  Split your project work into sections/categories/phases and add tasks for each of these sections. It is likely that the high-level objectives you identified in section 2.2 become sections here. The outputs from section 2.2 should appear in the Outputs column here. Remember to include tasks for your project presentation, project demos, producing your poster, and writing up your report. | | |
|  | | | |
| **Task No.** | **Task description** | **Effort**  **(weeks)** | **Outputs** |
| **1** |  |  |  |
| 1.1 | **Background Research** | 3 | … |
| 1.2 | Get pictures of buildings | 1 | Models for of buildings |
| 1.3 | Get pictures of campus | 1 | Models of campus |
| 1.4 | Get information about WhiteKnights campus | 1 | Voice lines of guided tours |
| **2** | **Analysis and design** |  |  |
| 2.1 | Design Buildings (insides as well) | 12 | Building models |
| 2.2 | Design outside parts of campus | 3 | Outside models |
| 2.3 | Get voice recordings | 1 | Used for guided tours part |
| **3** | **Develop prototype** |  |  |
| 3.1 | Combine both buildings and campus into one | 3 | Campus set for virtual reality |
| 3.2 | Make the virtual reality part controllable | 6 | Controllable virtual campus |
|  |  |  |  |
| **4** | **Testing, evaluation/validation** | 3 |  |
| 4.1 | Test virtual reality (self) | 1 | Bug fix report |
| 4.2 | Have a group test of the virtual reality | 1 | Bug fix report and feedback |
| 4.3 | Change parts of the virtual reality based on possible feedback | 1 | Hopefully a better version of the prototype |
| **5** | **Assessments** |  |  |
| 5.1 | write-up project report | 2 | Project Report |
| 5.2 | produce poster | 0.5 | Poster |
|  | … |  |  |
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|  |  |  |  |
| **TOTAL** | **Sum of total effort in weeks** | **39.5** |  |

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| **SECTION 4 - Time Plan for the proposed Project work** | | | | | | | | | | | | | |
| For each task identified in 3.1, please *shade* the weeks when you’ll be working on that task. You should also mark target milestones, outputs and key decision points. To shade a cell in MS Word, move the mouse to the top left of cell until the curser becomes an arrow pointing up, left click to select the cell and then right click and select ‘borders and shading’. Under the shading tab pick an appropriate grey colour and click ok. | | | | | | | | | | | | | |
| **Project stage** | **START DATE: 06/10/17 <enter the project start date here>****Project Weeks** | | | | | | | | | | | | |
| 0-3 | 3-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-21 | 21-24 | 24-27 | 27-30 | 30-33 | 33-36 | 36-39 |
| 1 Background Research |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Get pictures of buildings |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Get information about WhiteKnights campus |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 Analysis/Design |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Design Buildings (insides as well) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Design outside parts of campus |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Get voice recordings |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 Develop prototype. |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Combine both buildings and campus into one |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Make the virtual reality part controllable |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 Testing, evaluation/validation |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Test virtual reality (self) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Have a group test of the virtual reality |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Change parts of the virtual reality based on possible feedback |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 Assessments |  |  |  |  |  |  |  |  |  |  |  |  |  |
| write-up project report |  |  |  |  |  |  |  |  |  |  |  |  |  |
| produce poster |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Risk Assessment Form**

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| --- | --- | --- | --- |
| **Assessment Reference No.** |  | **Area or activity assessed:** | **The room where the VR headset is currently set in** |
| **Assessment date** |  |
| **Persons who may be affected by the activity (i.e. are at risk)** | **Person is currently using the VR headset** |

**SECTION 1: Identify Hazards -** *Consider the activity or work area and identify if any of the hazards listed below are significant (tick the boxes that apply).*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Fall of person (from work at height) | ✓ |  | Lighting levels | ✓ |  | Use of portable tools / equipment | ✓ |  | Vehicles / driving at work |  |  | Hazardous fumes,  chemicals, dust |  |  | Occupational stress |  |
|  | Fall of objects | ✓ |  | Heating & ventilation |  |  | Fixed machinery or lifting equipment |  |  | Outdoor work / extreme weather |  |  | Hazardous biological agent |  |  | Violence to staff / verbal assault |  |
|  | Slips, Trips & Housekeeping | ✓ |  | Layout, storage, space, obstructions | ✓ |  | Pressure vessels |  |  | Fieldtrips / field work |  |  | Confined space / asphyxiation risk |  |  | Work with animals |  |
|  | Manual handling operations |  |  | Welfare facilities |  |  | Noise or Vibration |  |  | Radiation sources |  |  | Condition of Buildings & glazing |  |  | Lone working / work out of hours | ✓ |
| 1. **55** | Display screen equipment | ✓ |  | Electrical Equipment | ✓ |  | Fire hazards & flammable material |  |  | Work with lasers |  |  | Food preparation |  |  | Other(s) - specify |  |

**SECTION 2: Risk Controls** *- For each hazard identified in Section 1, complete Section 2.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hazard No**. | Hazard Description | Existing controls to reduce risk | **Risk Level** (tick one) | | | Further action needed to reduce risks |
|  | High | Med | Low | *(provide timescales and initials of person responsible)* |
| 1 | User using the VR headset may not be aware of it’s current (in real life) surrounding and thus may trip/fall/bump into an object | Make the room empty and spacious |  | ✓ |  | Have a person supervise the current user using the VR set and support them should they fall. |
| 2 | Prolong use of the VR headset may cause eye strain/damage |  | ✓ |  |  | Have a person supervise the current user using the VR set the amount of time they have been on and warn them to get off once they reach a certain limit (15 minutes for example) |
| 3 | User may get nauseous when using VR (In general or for the first time) |  |  | ✓ |  | Have a person supervise the current user using the VR set and teach them how to use VR for the first time. |
| **Name of Assessor(s)** | |  | **SIGNED** | | | |
| **Review date** | |  |

|  |  |  |
| --- | --- | --- |
| **Health and Safety Risk Assessments** – continuation sheet | **Assessment Reference No** |  |
|  | **Continuation sheet number:** |  |

**SECTION 2 continued: Risk Controls**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Hazard No**. | Hazard Description | | Existing controls to reduce risk | **Risk Level** (tick one) | | | | Further action needed to reduce risks |
|  | High | | Med | Low | *(provide timescales and initials of person responsible for action)* |
| 4 | User may accidentally throw the VR Remotes at someone or something, potentially damaging them | | There are straps on the VR remote | ✓ | |  |  | Make sure the person supervising them enforces the users to put the strap on |
| 5 | Liquids poses a great risk to the VR set & computer running it since it is electrical | | No Liquids allowed signs in the room | ✓ | |  |  | Make sure the person supervising them prevent the user from consuming/bringing liquids. If the user needs to consume liquids, tell them to consume it outside of the room. |
|  |  | |  |  | |  |  |  |
| **Name of Assessor(s)** | |  | | | **SIGNED** | | | |
| **Review date** | |  | | |