3D Modelling with Unreal Engine

DO Duy Huy Hoang

University of Science and Technology Hanoi

ICT Department

2019-06-18

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I. Introduction

1.1 Context and Motivation

A virtual world or a digital world is a computer-based online community environment that is designed and shared by individuals, or may be populated by many users who can create a personal avatar so that they can interact in a custom-built, simulated world. These avatars are graphically rendered using computer graphics imaging (CGI) or any other rendering technology which can make people feel like they are in the real world. Individuals control their avatars using input devices like the keyboard, mouse and other specially designed command and simulation gadgets.

Today's virtual worlds are purpose-built for entertainment, social, educational, training and various other purposes. It is being more better than the real world. So the virtual reality has take over everything. For instance the illustrations showed in a game are more better than the reality we live in. It provides the gamer a whole new experience by taking over his imaginations it's as if we are playing the real game with all those real gaming characters in the real life. Virtual world is bringing out all our imaginations so that we can experience it in reality. Similarly for the automobile industry we can take a virtual ride of the desired vehicle we want to buy which provides a whole new dimension to the world of buying things.

Moreovers, virtual world has been adopted in education for teaching and learning situations. Students are able to interact with each other and within a three dimensional environment. Students can also be taken on virtual field trips, for example, to museums, taking tours of the solar system and going back in time to different eras.

1.2 Objectives

Develop an interactive 3D virtual world of USTH building from easily captured 2D images. Specific goals include - Collect a dataset of 2D images from cameras for different views of USTH - Conduct fully 3D models from collected 2D images which will be a 3D model foundations for other reaseacher or developer to create others world of USTH - Build a realtime and interactive 3D virtual world of USTH from constructed 3D models.

1.3 Thesis structures

II. State of the art

III. Programs, Materials, Methodologies

3.1 Programs

3.1.1 Sketchup

SketchUp is a 3D modeling computer program for a wide range of drawing applications such as architectural, interior design, landscape architecture, civil and mechanical engineering, film and video game design. This program was used in this project in order to create and conduct a fully 3D models from scratch. Therefore, they also provide an open library called 3D Warehouse which SketchUp users may upload and download 3D models to share. The models can be downloaded right into the program without anything having to be saved onto your computer's storage and it is free so anyone can download files for use in SketchUp or even other software such as AutoCAD, Revit and ArchiCAD.

3.1.2 3DS Max

Autodesk 3ds Max is a professional 3D computer graphics program for making 3D animations, models, games and images. With this feature, the software will help me to correct the position of the texture and also to edit UV mapping of some models.

3.1.3 Substance Painter

Substance Painter gives me all the tools I need to texture my 3D assets and also this software can help me to bake a normal map and metalic map.

3.1.3 Unreal Engine

3.3 Work Breakdown

3.3.1 Work Breakdown Diagram

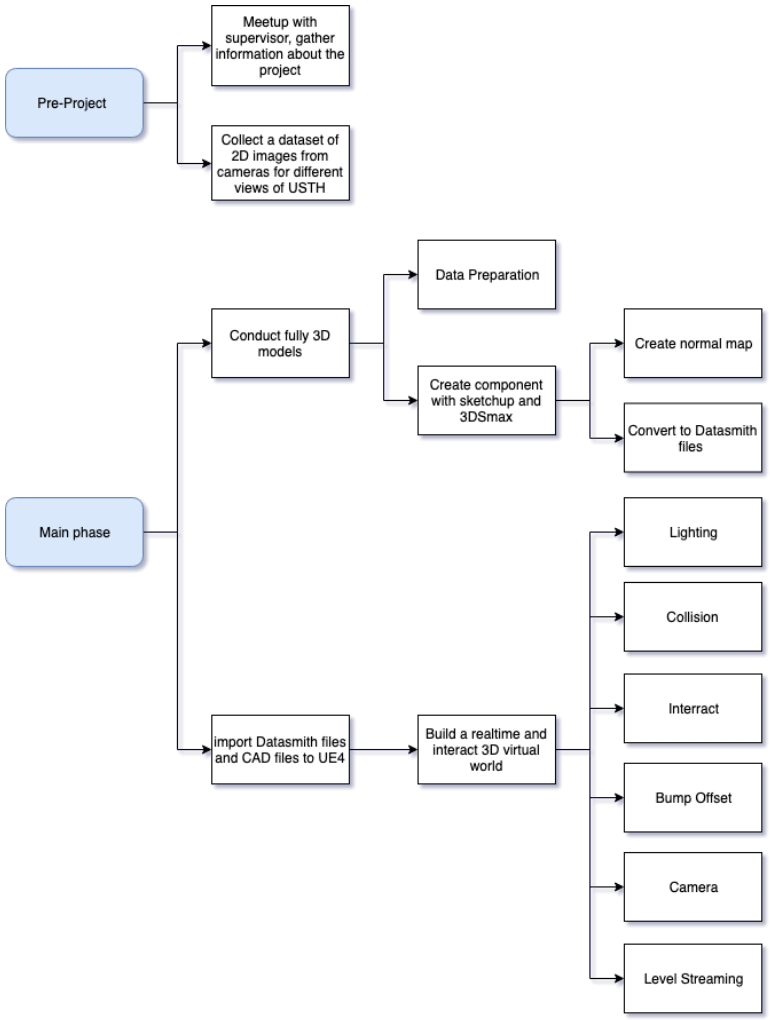

Figure 1: Work Breakdown Diagram

3.3.2 Work Breakdown Description

a. Pre-project

- Conduct a meeting with the participant of the Planning Phase, which involves setting expectations, articulating likely risk, etc.

- Develop Work Breakdown Structure: break the project into smaller, measurable of work packages with a work breakdown structure.
- **Collect a dataset** of *2D images* USTH: We will use a simple camera from a smartphones to perform this task. After taking picstures with different view of USTH, these photos will be classified to specific folder (e.g: Room 5/Lab ICT). This approach has two drawbacks howerver, it is time-consuming and easy to make mistakes.

b. Main phase

- Conduct fully 3D models from collected 2D images which will be a 3D model foundations for other reaseacher or developer to create others world of USTH.

3.3 Materials

3.4 Methods

IV Result and Discussion

V. Conclusion and Future work