SPL-2 Project Proposal

CHEMOUFLAGE

Learn Chemistry in an Interactive Way

SE 505: Software Project Lab 2

Submitted by

Mustahid Hasan – BSSE 1114

Tasmia Zerin – BSSE 1128

Supervised by

Dr. Ahmedul Kabir

Assistant Professor

Institute of Information Technology

University of Dhaka

05.02.2022

1. Introduction

Chemouflage is a chemistry based android application. The objective of the application is to teach the fundamental basics of chemistry (such as atomic and compound structures, compound forming) to the students in an interactive way. We want to make the application specially for school and college students using gamification method for fun learning. For this we will show the structures in a 3-Dimensional way and in Augmented Reality.

2. Scope of the Project

As the basic topics of Chemistry are numerous, we have initially set fixed elements and molecules visualization as our target.

2.1. Project Goal

Developing an Android application which will contain the 3D structures of the atoms and compounds. Also enable the users to interact with the elements in an augmented and gamified way.

2.2. Features

- The application will contain a periodic table from which the students will be able to choose an element and see the 3D structure of it, the orbits, and electrons within those.
- The user can view the structure in Augmented Reality mode by holding the device over an image of any element in the periodic table.
- He/she can check what happens if he/she increases or decreases any number of electrons from the orbits, or change the protons and neutrons from the nucleus.
- The valency, ionization energy, and electron affinity will be shown according to the change.
- The application will show how two atoms create bonds between them by showing ionic or covalent bond formation. After this, the compound will

be shown in 3 modes, one in orbit mode, one in structural formula and the last one ball and stick 3D model.

Due to time limitations, we have decided to implement the 3D models of molecules from Hydrogen to Calcium (1 - 20 of the periodic table). Also, there will be a fixed set of compounds containing ionic and covalent bonds.

2.3. Languages & Tools to be used

- Unity for Game UI and 3D modeling
- C# for scripting language
- ARFoundation framework for enabling the AR mode

2.4. Deliverables

- SRS Documentation
- Final Report
- APK file of the application

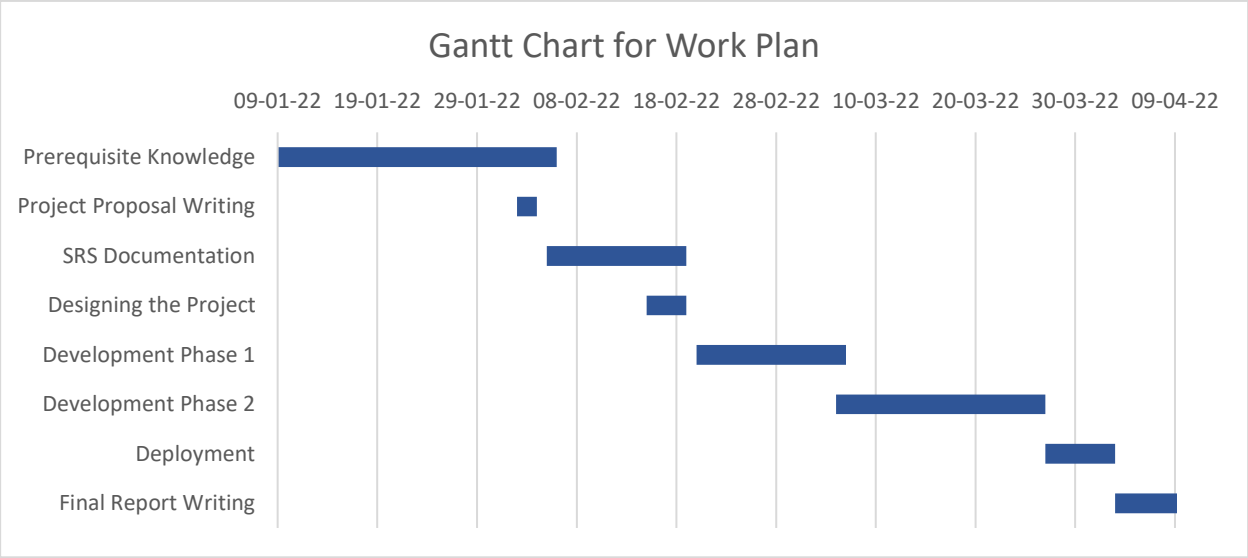
3. Motivation

Nowadays, students find it boring to only read books for studying. They can't relate their learnt knowledge to real life examples. They can't visualize the structures, how the atoms look like or how the compounds are formed.

So, we have thought of making an application which will be more of a game than a typical learning app. The target users for this application are secondary and higher secondary level students. Our survey shows the fact that the students are now more interested in learning through a realistic and practical way rather than only reading the books. Moreover, around 83% of them (according to our survey) are more used to android devices than laptops and computers. We propose to build an android application that uses Gamification and Augmented Reality for making an interactive learning platform.

4. Work Plan

- Writing the Project Proposal
- SRS Report Documentation
- Designing the complete project
- Development
    - Blender for making the 3D objects (Phase 1)
    - Unity for making the user interfaces (Phase 1)
    - ARFoundation for image tracking and object placement (Phase 2)
- Deployment of the final project
- Final Report Writing



Supervisor's Approval: _____