

Chemistry VR



Team UTM - VR Pioneers Students:

Popa Rareș-Sebastian Tudor Andrei-Cătălin

Coordinator: Grecu Dan-Laurențiu









Project Objectives

Our project called Chemistry VR tries to recreate molecules and atoms while using the breakthroughs in Virtual Reality. We have 3 scenes, one for the atom viewer where you can select an atom from the periodic table, one for molecules where you can select molecules from the table and the third is for the particle colider . The database is made in such a way that we can obtain every property we could need for atoms and molecules (e.g. Atomic Mass, Atomic number etc.). Everything was coded from scratch, with little or no information on how to do it.



The final goal of our project is to recreate a realistic chemistry lab, so that the user can experience the reactions without the fear of injury or going bankrupt by acquiring a real chemistry lab.

Project Use

Our project will be used mainly for scientific purpose to avoid accidents which can occur in normal laboratories. Our method is safer and no harm can take place in virtual reality.



Tehnologies

Our project needed two essential components to make it happen, a game engine to simulate and to create the subatomic world and another to view the subatomic world in virtual reality. Unity Engine is the game engine that we used and helped us accomplish our goal and Oculus Rift is the virtual reality headset .

Oculus

Unity 5 is the new edition of the best development platform for creating 2D/3D games and interactive experiences. Unity 5 brings you awesome new artistic power. Improved efficiency makes the hard work smoother and more fun, and with the industry's most comprehensive multiplatform support, you can now launch your game on 21 platforms.

PHYSICALLY-BASED STANDARD SHADER

The new Standard Shader will make your materials look consistent in any lighting environment, across mobile, high-end desktop, and consoles. Apply it across 95% of the materials in your game, such as metal, plastics, wood, ceramics and cloth. Use it together with the new HDR Skybox, Reflection Probes andGlobal Illumination System to create stunning visuals.





REAL-TIME GLOBAL ILLUMINATION

Animate lighting with Real-time Global Illumination built on Geomerics Enlighten technology. Achieve dynamic lighting treatments on high-end mobile, desktop and consoles, and for lower-end devices, create beautifully detailed results with baked artwork.

NEW PHYSICS ENGINE

PhysX 3.3 brings massive performance improvements to 3D physics in Unity 5. New multithreaded simulation is available for platforms that support it, and there's a new cloth component for character clothing. New wheel colliders bring better support for suspension and tire force simulation. Collision detection is improved and bakefree scaled MeshCollider support is added.





Next-Generation Virtual Reality Technology

DK2 is the latest development kit for the Oculus Rift that allows developers to build amazing games and experiences for the consumer Oculus Rift.



Low Persistence OLED Display

DK2 uses a low persistence OLED display to eliminate motion blur and judder, two of the biggest contributors to simulator sickness. Low persistence makes the scene appear visually stable, increasing the potential for presence.

Engine Integrations

The Oculus Software Development Kit (SDK) includes out-of-the-box engine integrations for the Unreal Development Kit, Unreal Engine 4, and Unity 4 that make getting started with VR game development easier and faster than ever.

Interface	
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The interface of our project lets the user to choose between three scenes: Atomic Viewer, Molecular Viewer and Particle Collider. We also have a Help button that goes into a help panel where the user can get friendly with the controls and get information about the program.

The periodic table is a tabular arrangement of the chemical elements, organized on the basis of their atomic number (number of protons in the nucleus), electron configurations, and recurring chemical properties. Elements are presented in order of increasing atomic number, which is typically listed with the chemical symbol in each box. The standard form of the table consists of a grid of elements laid out in 18 columns and 7 rows, with a double row of elements below that. The table can also be deconstructed into four rectangular blocks: the s-block to the left, the p-block to the right, the d-block in the middle, and the f-block below that.

Molecules

On the molecule scene the user can select form the 25 most common molecules on the table and then will be generated a field of molecules from the one the user selected.





Particle accelerator

A **particle accelerator** is a device that uses electromagnetic fields to propel charged particles to high speeds and to contain them in welldefined beams. Large accelerators are best known for their use in particle physics as colliders (e.g. the LHC at CERN, RHIC at Brookhaven National Laboratory, and Tevatron at Fermilab). Other kinds of particle accelerators are used in a large variety of applications, including particle therapy for oncological purposes, and as synchrotron light sources for the study of condensed matter physics. There are currently more than 30,000 accelerators in

operation around the world.





Thank You for your

attention!