

Virtual Reality (VR) can be used to simulate radiation physics in a safe environment where the properties of various radiation sources, detectors, radioactive decay, and shielding can be demonstrated. A digital laboratory space has been created in Unity Technologies Unity game engine for a VR game based on this principle. A nonplayer character (NPC) was developed for the purpose of guiding the player through the virtual space and providing lessons on multiple radiation physics concepts. Initial progress on the game included an NPC which was programmed in C# with one dialogue sentence and could initially move to greet the player. Existing code was segmented into dialogue and navigation managers which individually controlled the NPC. This work addresses those issues. New code was written combining movement and dialogue into one script allowing more flexibility in displayed NPC behavior in a given moment. Additional code was created allowing game actions to control the NPC's state. There was difficulty implementing controls in the engine's interface that would allow for designing the complex movements and dialogue of the NPC to be put together in sequence as play progresses. Ultimately a state machine design was selected with controls exposed in the engine's interface, allowing designers to create NPC states and customize their corresponding behavior. The revised character utilizes written dialogue to guide the player through the space while progressing through an initial tutorial. Indicators in the 3D environment assist the NPC's navigation, directing the player towards the area they are meant to work in, and guiding the player to objects they are intended to interact with. A future implementation of this NPC will feature a detailed 3D model, fully mapped movement throughout the lab space, audio dialogue, and tools to assess the player's achievement of the game's educational objectives.