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Employing 3D Virtual Reality and the Unity Game Engine to Support Nuclear Verification Research

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This project centers on the development of a virtual nuclear facility environment to assist non-proliferation and nuclear arms control practitioners –including researchers, negotiators, or inspectors –in developing and refining a verification system and secure chain of custody of material or equipment. The platform for creating the virtual facility environment is the Unity 3D game engine. This advanced platform offers both the robust capability and flexibility necessary to support the design goals of the facility. The project also employs Trimble SketchUp and Blender 3D for constructing the model components. The development goal of this phase of the project was to generate a virtual environment that includes basic physics in which avatars can interact with their environment through actions such as picking up objects, operating vehicles, dismantling a warhead through a spherical representation system, opening/closing doors through a custom security access system, and conducting CCTV surveillance. Initial testing of virtual radiation simulation techniques was also explored in preparation for the next phase of development. Some of the eventual utilities and applications for this platform include (1) conducting live multi-person exercises of verification activities within a single, shared virtual environment, (2) refining procedures, individual roles, and equipment placement in the contexts of non-proliferation or arms control negotiations (3) hands on training for inspectors, and (4) a portable tool/reference for inspectors to use while carrying out inspections. This project was developed under the Multilateral Verification Project, led by the Verification Research, Training and Information Centre (VERTIC) in the United Kingdom, and financed by the Norwegian Ministry of Foreign Affairs. The environment was constructed at the Vienna Center for Disarmament and Non-Proliferation (VCDNP).

Country or International Organization

Vienna Center for Disarmament and Non-Proliferation

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