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Virtual Reality Based Accurate Radioactive Source Representation and Dosimetry For Training Applications

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Virtual Reality (VR) technologies have much potential for training applications. Success relies on the capacity to provide a real-time immersive effect to a trainee. For a training application to be an effective/meaningful tool, 3D realistic scenarios are not enough. Indeed, it is paramount having sufficiently accurate models of the behaviour of the instruments to be used by a trainee. This will enable the required level of user's interactivity. Specifically, when dealing with simulation of radioactive sources, a VR model based application must compute the dose rate with equivalent accuracy and in about the same time as a real instrument. A conflicting requirement is the need to provide a smooth visual rendering enabling spatial interactivity and interaction. This paper presents a VR based prototype which accurately computes the dose rate of radioactive and nuclear sources that can be selected from a wide library. Dose measurements reflect local conditions, i.e., presence of (a) shielding materials with any shape and type and (b) sources with any shape and dimension. Due to a novel way of representing radiation sources, the system is fast enough to grant the necessary user interactivity. The paper discusses the application of this new method and its advantages in terms of time setting, cost and logistics.

Country or International Organization

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