Research report: review study of virtual reality techniques used at nuclear issues with emphasis on brazilian research

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Some of the procedures referred to nuclear issues like evacuation training [1], waste management [2] and radioactive dose assessment evaluation [3] are related to dangerous situations where the health of the involved personnel can be compromised. For this reason, several researchers have been proposing the use of virtual reality techniques to help on performing this kind of task. Moreover, there are other applications using this type of tool which allow not only the achievement of better results in comparison to the already available procedures but also provide the development of new technologies. Therefore this work proposes to make a review study concerning to some of the applications of virtual reality techniques and concepts at nuclear issues highlighting some of the works developed in Brazil. To do so, the analyzed researches were organized according to its similarities, objectives and applicability. The goal of this survey is to provide a brief glance concerning to the information about the chronological evolution of this practice describing some of its results besides of showing prospects for further works.

From the examined literature, it is clear that the use of VR has provided the development of very interesting and useful applications concerning to this branch of science. It has been shown applications concerning to personnel training; physical security evaluation; ergonomic analysis; radioactive dose assessment; speech recognition; evacuation planning; nuclear waste management, etc., each of them using VR concepts.

At present, new surveys are taking place where more advanced software and game engines will not only provide a more realistic interaction inside the virtual environment used for training but it will also allows the user to experience a more reliable feeling of immersion using devices like oculus RIFT, for instance. Another interesting characteristics of the VR technologies is the fact that already finished works can be improved according to the development of computational resources which grants more detailed environments allied to more natural avatar and vehicles movements with a minor effort of the equipment.

References

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