

Analysis of 3D videos based on nuclear energy concepts

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Nuclear energy has many useful applications to society. The best known is the generation of electricity in nuclear plants [1]. However, there are numerous other applications in medicine and industry that remain unknown to the general public [2]. Nuclear medicine is a good example of the benefic use of nuclear energy [3, 4]. Nuclear techniques are used both for diagnosis and for the treatment of various diseases, such as cancer. They are also used in various industrial processes [3] such as the inspection and non-destructive testing of materials, which allow, for example, for the identification of structural failures in aircraft parts which, if undetected, could result in accidents. Other examples are the efficient evaluation of industrial mixers and assessment of multiphase flows, with wide application in the petrochemical industry, where it is necessary to evaluate the flow of materials in more than one state (solid, liquid and gaseous) in a pipe. However, a negative view of nuclear energy remains, often as result of propagation through different media emphasizing environmental disasters due to leak of radioactive material from nuclear accidents, the use, in the past, of nuclear weapons in World War II [5], or simply to the population's lack of knowledge. Studies indicate that both high school and undergraduate students, as well as the general public, have disjoint and vague notions about radiation and nuclear energy and ignore its benefits from medical or industrial applications [6, 2]. In this context, the aim of this study is to demystify the negative view of nuclear energy by showing the benefits of its use. In more specific terms, it aims at showing the benefits of nuclear energy to high school students, as they are still being educated and, thus, represent the future of our society.

In this sense, the use of new visual technologies can facilitate new information learning, providing ludic environments, compared to traditional means such as texts, oral presentations and the use of static images. An educational video with these features was produced in the Virtual Reality Laboratory (LABRV), at the Nuclear Engineering Institute (IEN/CNEN) for dissemination of nuclear energy applications in society, using virtual reality techniques. The work described in this report was published by the authors at the International Nuclear Atlantic Conference - INAC 2013[7].

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