

## **VRvisu: A Tool for Virtual Reality Based Visualization of Medical Data**

A large body of research is available on data visualization and many tools have been developed to visually comprehend large healthcare datasets. However, little attention has been paid to the area of visualization using virtual reality (VR). In order to fill this gap, we designed and developed a tool called VRvisu to visualize large and complex medical datasets using VR. The design intent of VRvisu is to support the exploration of medical data via VR-based visualizations. VRvisu is an application written for use on a desktop computer with an HTC Vive VR headset as well as a Leap Motion Camera. It is written in C# programming language using the Unity Framework. The tool development process involves four steps: 1) data collection 2) generating 3D models 3) processing 3D models and 4) implementation.

In the first step, Jason collected the necessary data from the Cancer Imaging Archive (TCIA), which includes Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) images of tumors as well as the information regarding the patients' diagnoses. In the second step he constructed three-dimensional data models of the tumors. To that end, he identified an open source software called InVesalius, which is efficient to view the images as well as create a three-dimensional model of the tumor and other parts of the image. Further, he used 3D imaging software such as MeshLab in order to preprocess the tumor dataset for a VR environment. Finally, he imported the pre-processed dataset into Unity — a framework used to create games as well as virtual reality applications.

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