**Summary 2:**

**BrainWatch software for interactive exploration of brain scans in 3D virtual reality systems**

Complicated structures of the brain have commonly been expressed using 2D imaging in the medical field (PET or MRI scans). However, it is more effective to use 3D viewing methods for humans to gain a true understanding of the brain because it is a complex 3D object. With the increasing quality and availability of VR technology, an application called BrainWatch was developed. BrainWatch processes brain scan slices in DICOM format (Digital Imaging and Communications in Medicine) and converts these scans into texture2D objects, which are eventually used to generate a 3D volume that can be rendered to the VR environment. Users may move around the outside and inside the brain to explore the object. Movement is designed to be natural and incorporates user’s natural gaze among keyboard controls. Users ranged from students to clinicians and expressed that it would have been easier to learn brain anatomy using this method instead of using 2D cross-sectional images and diagrams. Current model focus more on testing the concept and future work will go towards perfecting the image processing and rendering processes.

**BibTeX:**

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abstract={The ability to view medical images as 3D objects, which can be explored interactively, has now become possible due to the advent of rapidly emerging virtual reality (VR) technologies. In the past, VR has been used as an educational tool for learning anatomy, a visualization tool for assisting surgery, and a therapeutic tool for rehabilitating patients with motor disorders. However, these older systems were either expensive to build or difficult to acquire and use. Exploiting the arrival of new consumer devices such as the Oculus Rift that are now affordable, we have developed a software application called BrainWatch for VR ready computers to enable 3D visualization and interactive exploration of DICOM data sets focusing on PET and MRI brain scans. BrainWatch software provides a unique set of 3 approaches for interacting with the virtual object which we have named the observatory scenario with an external camera, the planetarium scenario with an internal camera, and the voyager scenario with a mobile camera. A live interactive demo of BrainWatch VR with the Oculus Rift CV1 will be available for conference attendees to experience at EMBC 2017.},   
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