



Generation of a 3D printed brain model from MRI scan data to assist in Brain Surgery (using open source tools)

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Abstract:

The potential of medical 3D printing for improved patient treatment attained recognition after the MRI (Magnetic Resonance Imaging) technology got invented almost 30 years ago. Further development in this technology focused on providing enhanced quality images, speed and patient comfort. This project work aims to convert the MRI scan data of brain into its equivalent 3D Model using open source tools, which provide the facility of improved processing, and this in turn, aids in converting the same into a sliced model and then 3D Prints it using Fused Deposition Modeling technique. This helps to generate physical, patient-specific 3D models of the brain. The benefits of this work include planning complex surgical interventions in the pre-operative stage thus, reducing the steps involved in implant/removal as well as the time span for which the patient is kept under the impact of anesthesia. This also has an additional advantage of helping with intraoperative orientation. It is understood that, this model will prove to be highly useful with respect to treating a complex organ like the human brain, since its intricate shape makes its 3D rendering a difficult task. Thus, the creation of a live size model of the patient's brain with cut-sections at the tumor's location will definitely assist the neuro surgeons with brain surgeries involving tumor removal.

Biography:

Shreeprasad S. Manohar has completed his Masters from Mumbai University in CAD/CAM & Robotics in October 2011 and since then working as Assistant Professor in Mechanical Engineering Department at Don Bosco Institute of Technology, Mumbai. He has many International Conference Publications in the fields of CAD and Finite Element Analysis. For past 3 years he is working in 3D Printing and its medical applications and this paper is the outcome of his research.



Publication of speakers:

- Shreeprasad S. Manohar et al ; Reward Pays the Cost of Noise Reduction in Motor and Cognitive Control, 2015 Jun 29
- Shreeprasad S. Manohar et al ; Attention as foraging for information and value, 2013 Nov 5.
- Shreeprasad S. Manohar et al; An In Vitro Model for Assessing Corneal Keratocyte Spreading and Migration on Aligned Fibrillar Collagen, 2018 Sep 21.
- Shreeprasad S. Manohar et al; A new acoustic lens material for large area detectors in photoacoustic breast tomography, 2013 May 28
- Shreeprasad S. Manohar et al; Working Memory for Sequences of Temporal Durations Reveals a Volatile Single-Item Store, 2016 Oct 26

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