A Unified Web-Based Visualisation and Mesh Processing Application for Medical 3D-Printing

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Introduction

The 3D printing of models generated from medical scan data is a relatively new application within the medical field. However, there has yet to be established any standardized pipeline for creating, processing and validating of image segmentations and generated 3D meshes. While the features and functions necessary to do so can be assembled from various collections of open and closed source software, this requires users to repeatedly export and import their work between these applications and become familiar with the basic usage and idiosyncrasies of each.

This application aims to bring together the required features from each of these different application classes into a single web based tool. It can handle every step of the process; moving from source medical scan images to a completed and validated 3D mesh, which is ready for printing.

Centralised Work Flow

Model Generation

Removal of Islands

Culling and Merging

Topological Corrections

Printing of Model

Typical Pipeline

Annotation

Verification

Affiliations, Sponsors

Innovate UK

Ulster University

Future Development

Continued development of the service will include refinement of the current implementation, in addition to:
- Comprehensive User Testing
- Full integration of a segmentation editor
- Implementation of an AR viewer
- In browser mesh deformation library
- Remote DICOMweb integration

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