

# University of Leeds 3D annotation tool

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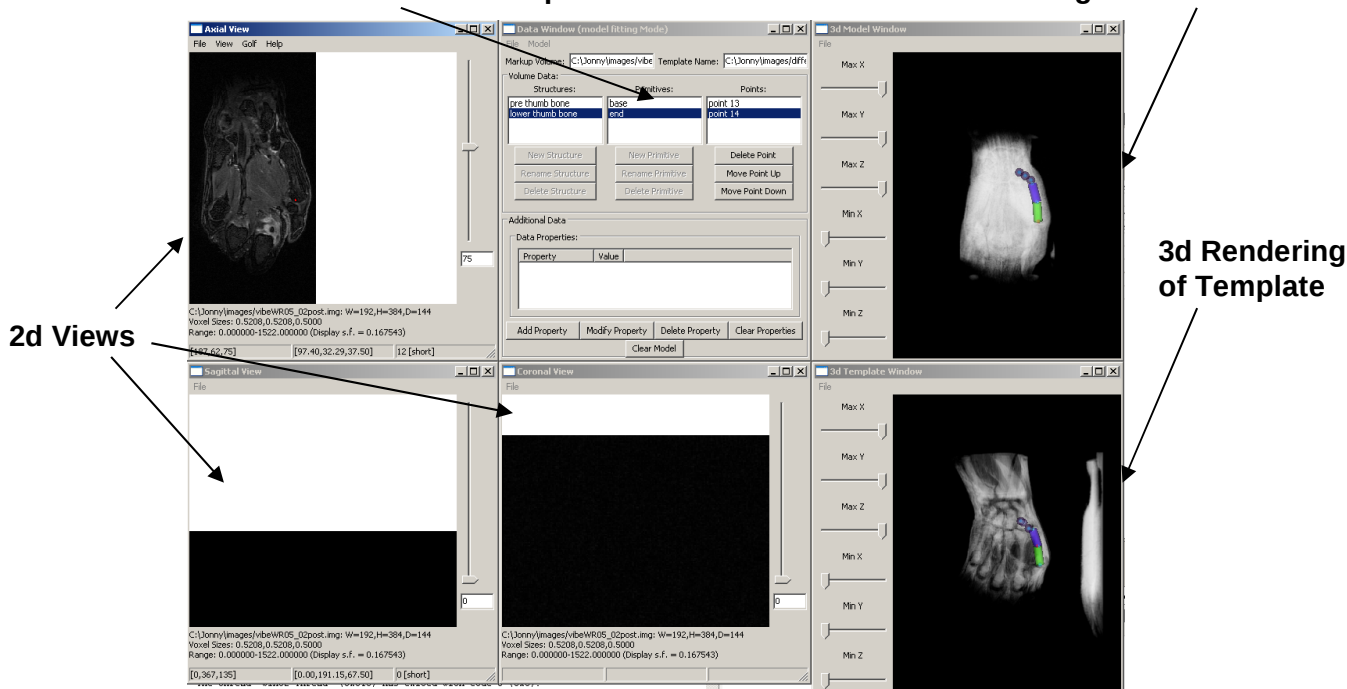
Summer Research Internship 2009

**The Aim:** The aim of the project was to create a model building tool capable of representing the different bones in the hand with the idea of being able to predict the internal anatomy of the hand from the position of external markers using regression.

**The Model:** With such a model the movement of the bones in the hand/wrist can be estimated without the use of MRI. This allows for more freedom of movement + much quicker results – e.g. analysing the movement in a golfer's hand/wrist whilst swinging a club with only external markers present. A data set was used to perform regression and as there are many different bones in the hand (all with different shapes and sizes), the project demanded a program which allows a structured + simple approach to marking up multiple data sets with a common template.

View of data + controls for manipulation

3d Rendering of Current Model



**The Application:** The program allows a user to draw simple primitives (spheres and cylinders) which form the structures necessary to represent the different bones by clicking on the 2d images of the volume. The user can also add key external data such as rotation of the arm and angle of the elbow bend. Structure is provided to the process without forcing the use of a pre-conceived protocol. When completed, the model can then be used as a template to mark up other volumes – to this end the user can see both volumes and their 3d renderings with selected parts highlighted. The tool also has a facility for selecting relevant variables from the models for output and automatically aligns the variables with a transform calculated from a user defined subset of variables.

**Partnership:** This project was achieved working in conjunction with two doctors from Chapel Allerton Hospital

