From Bones to Bytes: Turning the Human Body into a 3D Model Library


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PURPOSE

Creation of a digital library of 3D models using human cadaveric material

METHODS

Human bones, brains, liver, hearts and prospection models were scanned and processed. A Thiel embalmed human cadaver was dissected layer by layer, scanned and processed (Fig. 1-3).

Step 1: Collection/Dissection
Performed by medical students

Step 2: Scanning
Using the high-resolution (accuracy 0.05 mm) structured-light Artec® Space Spider 3D surface scanner

Step 3: Processing
Using Artec® Studio 15 to clean, align and finalize the model with smooth/sharp fusion and texture mapping

RESULTS

• Library of 3D anatomical models: small features were well preserved due to high resolution scanning. Realistic color and shape were obtained through texture mapping (Fig. 4-8).

• Three-dimensional display enhances students’ interactivity and spatial awareness. Scan the QR-code to experience it yourself!

CHALLENGES

Positioning: • The cadaver must be fixed in positions that allow 360° accessibility for scanning.

• Movement of body parts while scanning can cause deformation and misalignment during processing.

Aligning: • Correct alignment of the different smaller scans is needed to create a full anatomical model.

File size: • The file size frequently exceeds several gigabytes, limiting further editing and integration of these models into digital environments.

CONCLUSION

• The preliminary results show that this method can accurately visualize anatomical structures and transform human cadavers into detailed 3D models.

• 3D anatomical models can be incorporated into several digital learning applications.

• Further data collection is needed to generate a full anatomical library.