SCANCO MEDICAL

application note

3D-printing of a bat skeleton

MicroCT imaging is a very useful tool for building 3D models used for 3D printing. *The Swiss foundation for bat conservation* use skeletons for educational purposes but as the preparation of skeletons is complicated and time consuming it is difficult to have enough available for the given courses. By scanning the skeleton of a Kuhl's pipistrelle bat (Pipistrellus kuhlii) an exact replica of the real skeleton could be created using a 3D printer.

Figure 1 The original skeleton of a Kuhl's pipstrelle bat.

SCANCO Equipment
XtremeCT II

Scan parameters
Energy: 68 kVp
Field of View: 140 mm
Resolution: 30 µm
Integration time: 300 ms
Projections: 2000/180°

Even though the body of the bat was rather small, the distance between the tips of the wings is very large. The bat skeleton was therefore scanned using the XtremeCT II at a resolution of 30 µm in order to capture the finest structures of the foot, namely the spurs that were not more than 40 µm large. The XtremeCT II combines a large field of view with the highest achievable resolution and comfortable space to position the sample. It has a rotating gantry so that the bat could remain in a fix position to avoid damaging.

Figure 2 3D rendering of the segmented images of the scanned skeleton.

The microCT images were then segmented using a very low threshold in order to keep the smallest details. The segmented file was then turned into an STL-file using IPL (SCANCO Image Processing Language). The STL-file could then be exported and used for 3D printing. The printer used was a ProJet 3500 HDmax using VisiJet Crystal as printing material.

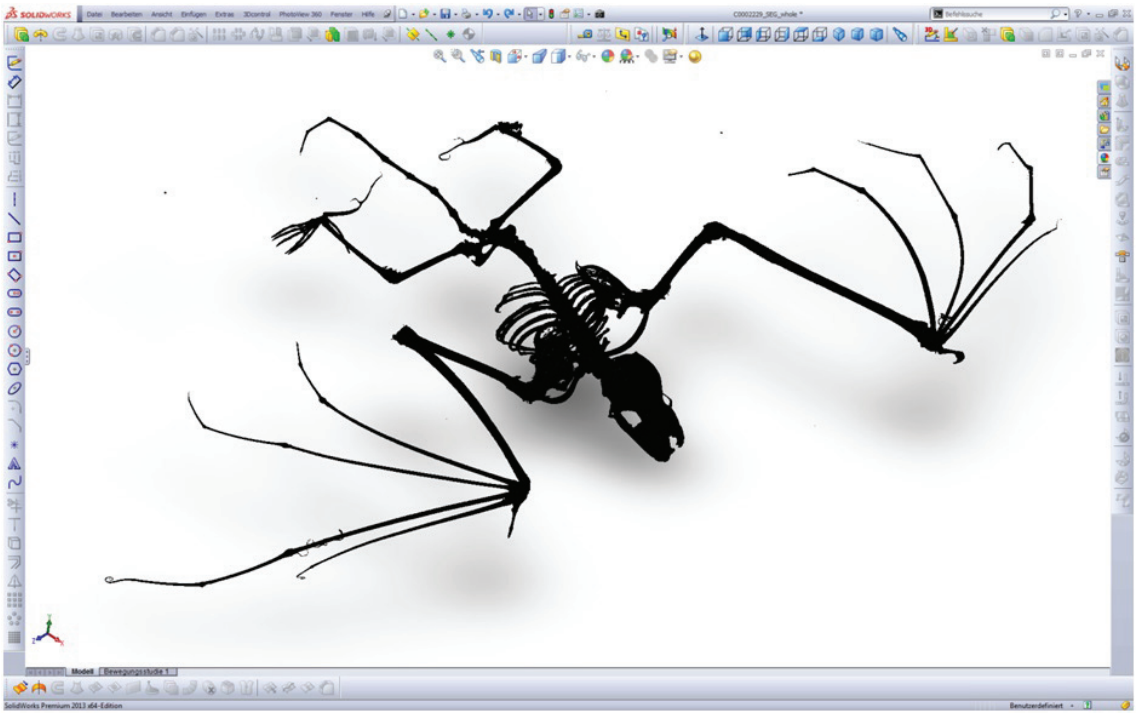

Figure 3 The STL-file of the segmented bat can be imported into a large variety of software, i.e. SolidWorks as above.

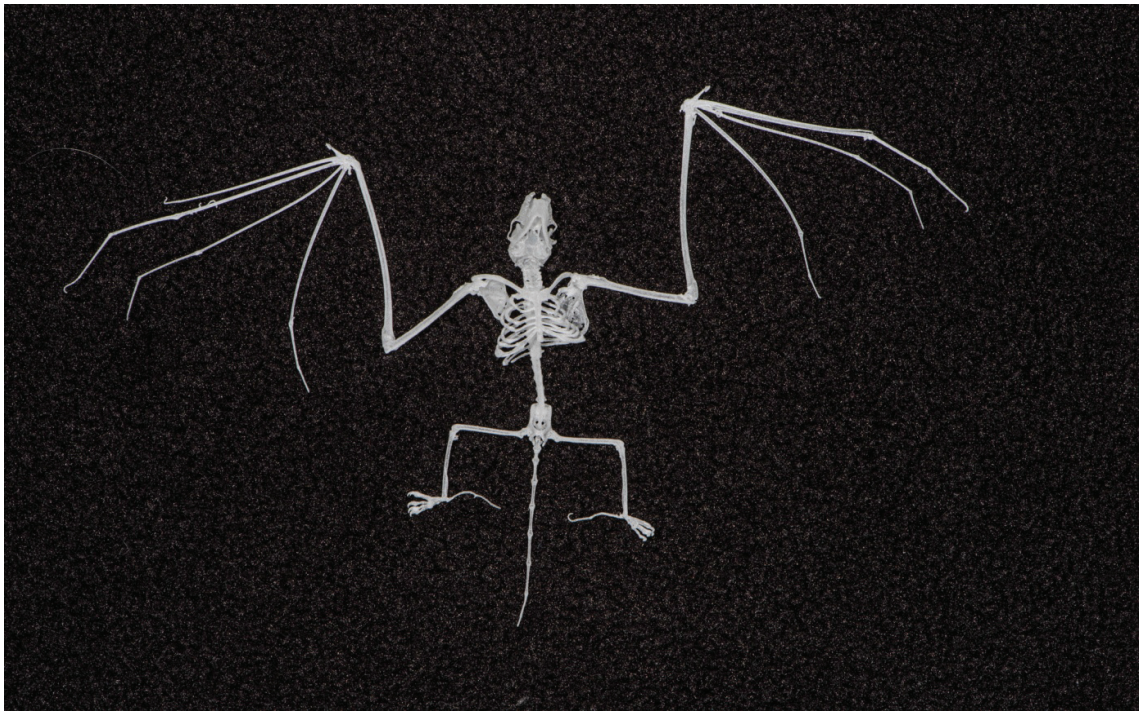

Figure 4 A photo of the final 3D printed replica of the bat skeleton.