A High-resolution Model of the Inner Organs Based on the Visible Human Data Set
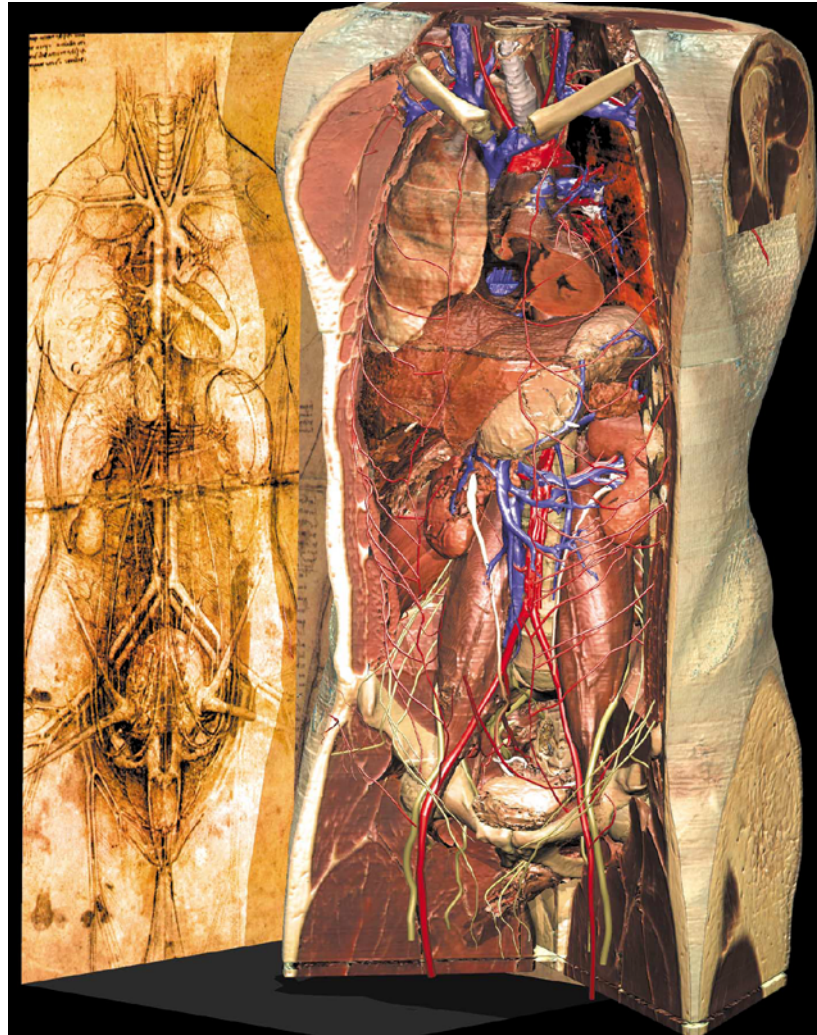
Tiede, U.[1], Pommert, A.[1], Pflesser, B.[1], Richter, E.[1], Riemer, M.[1], Schiemann, T.[1], Schubert, R.[1], Schumacher, U.[1] and Höhne, K.H.[1]

1) *Institute of Mathematics and Computer Science in Medicine, Department of Pediatric Radiology, Institute of Anatomy, University Hospital Hamburg-Eppendorf, Martinistrasse 52, 20246 Hamburg, Germany*

A 3D model of the inner organs was developed based on more than 1000 photographic cross-sectional and congruent computer-tomographic images of the male Visible Human. Its constituents were created using color-space segmentation and graphic modelling (especially for small objects like nerves and blood vessels) [1]. The thus generated volume containing multiple attributes and multiple modalities is rendered using volume visualization with subvoxel resolution [2]. The model contains a semantic network knowledge base allowing its interrogation. A three-dimensional atlas of anatomy and radiology with 650 objects based on this model is available as a PC-based program [3]. The shown composition illustrates the development from drawings (Leonardo da Vinci, 1490) to computerized models.

1. Andreas Pommert, Karl Heinz Höhne, Bernhard Pflesser, Ernst Richter, Martin Riemer, Thomas Schiemann, Rainer Schubert, Udo Schumacher, Ulf Tiede: Creating a high-resolution spatial/symbolic model of the inner organs based on the VisibleHuman. Med. Image Anal. 5, 3 (2001), 221-228

2. Ulf Tiede, Thomas Schiemann, Karl Heinz Höhne: High quality rendering of attributed volume data. In David Ebert et al. (eds.): Proc. IEEE Visualization 1998. Research Triangle Park, NC, 1998, 255-262.

3. Karl Heinz Höhne, Bernhard Pflesser, Andreas Pommert, Kay Priesmeyer, Martin Riemer, Thomas Schiemann, Rainer Schubert, Ulf Tiede, Hans Frederking, Sebastian Gehrmann, Stefan Noster, Udo Schumacher: VOXEL-MAN 3D Navigator: Inner Organs. Regional, Systemic and Radiological Anatomy. Springer-Verlag Electronic Media, Heidelberg, 2000. (3 CD-ROMs, ISBN 3-540-14759-4).