

# Computational Models of the Human Body for Medical Image Analysis

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## Abstract

Medical image analysis brings about a collection of powerful new tools designed to better assist the clinical diagnosis and to model, simulate, and guide more efficiently the patient's therapy. A new discipline has emerged in computer science, closely related to others like computer vision, computer graphics, artificial intelligence and robotics.

In this talk, I describe the increasing role of computational models of anatomy and physiology to guide the interpretation of complex series of medical images, and illustrate my presentation with applications to cardiac and brain diseases. I conclude with some promising trends, including the analysis of in vivo confocal microscopic images.

*N. Ayache, O. Clatz, H. Delingette, G. Malandain, X. Pennec, and M. Sermesant. Asclepios: a Research Project at INRIA for the Analysis and Simulation of Biomedical Images. In Proceedings of the Colloquium in Memory of Gilles Kahn, LNCS, 2007. Springer. Note: In press (20 pages).*

This reference and others are available at <http://www-sop.inria.fr/asclepios/>

## Biosketch

Nicholas Ayache leads the research group Asclepios at INRIA Sophia-Antipolis. His recent research interests have been in biomedical image analysis and simulation using advanced geometrical, statistical, physical and functional models to better assist prevention, diagnosis and therapy. He has also contributed to the design of innovative systems for surgery simulation and image-guided therapy. He is the author and co-author of more than 200 scientific publications in these domains. In December 2006, Nicholas Ayache received the [Grand Prize of Information Sciences and Applications](#) from the EADS Foundation and French Academy of Sciences.

More at <http://www-sop.inria.fr/asclepios/personnel/Nicholas.Ayache/ayache.html>