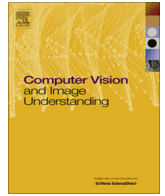


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Editorial

Special issue on Shape Modeling in Medical Image Analysis

Exploring and using anatomical shape properties plays an increasingly important role in many medical imaging and image processing applications, including structural analysis and modeling, medical image segmentation, image registration, computer aided diagnosis, tracking and longitudinal analysis, and medical navigation. For example, prior knowledge on the shape of interest has been used to achieve more accurate segmentation, e.g. in case of ambiguities owing to limited image quality. In neuroscience, the shape of certain brain structures, such as hippocampus, has been shown to be useful for predicting the development of a brain disease, such as Alzheimer's. In cardiac imaging, the accurate tracking of the shape of the left and right ventricles facilitates the computer aided diagnosis of cardiovascular diseases. In the meantime, a diversity of mathematical tools and models, such as 2D/3D geometric analysis, statistical analysis, deformation models, kinematic analysis, graph theory, and machine learning have been used for extracting, analyzing, and modeling the shape and apply the obtained shape information for different medical imaging applications.

This special issue consists of 15 full research articles that are selected from 22 submissions based on rigorous peer reviews. These papers cover a wide spectrum of research that is important to shape modeling in medical image analysis. For example, these papers report new approaches to segment and track ventricles, localize thoracic vertebra, detect prostatic zones, measure the change of the hippocampus, register 2D/3D images, and construct

3D anatomic atlas, from different medical images. We believe the articles in this special issue reflect the most recent research progress on this important research area.

We would like to thank Linda Shapiro for her support in paper submission, paper review and final paper selection. We also appreciate the help from the Editor-in-chief Avi Kak in handling many difficult issues in the process of paper review and decision. We thank all the reviewers for providing high-quality, constructive reviews.

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