

Preface

This volume contains the proceedings of the First International Workshop on Spectral and Shape Analysis in Medical Imaging (SeSAMI 2016) held on October 21, 2016, in Athens, Greece, in conjunction with the 19th International Conference on Medical Image Computing and Computer Assisted Interventions (MICCAI 2016). This workshop is an extension of the Spectral Analysis in Medical Imaging (SAMI) workshop held at MICCAI 2015.

Today's image data often represent continuous and time-varying phenomena, usually with a geometric structure. Shape and geometry processing methods are, therefore, starting to receive increased attention, for example, due to their higher sensitivity to local variations relative to traditional markers, such as the volume of a structure. In medical image computing or computer-aided interventions in particular, the understanding of shapes and their geometrical representations enables the modeling of organs from an anatomical as well as a functional perspective.

Moreover, spectral methods provide a wealth of opportunities for studying complex data. They support the analyses by helping to understand high-dimensional structures representing population or disease data and are often combined with shape analysis due to their properties, such as isometry invariance. Both shape and spectral analysis have, therefore, found many applications in medical image analysis.

This workshop provided an invaluable opportunity for researchers to present recent work on spectral and shape analysis, as well as methods at the intersection of these domains, and consisted of two components. The first focused on theoretical aspects and state-of-the-art research on spectral analysis and the characterization of shape in the form of talks and invited expert presentations. The second focused on cutting-edge research on medical image applications in the form of oral presentations of accepted submissions. Novel and original submissions were encouraged on emerging approaches with topics including segmentation, registration, and classification.

We are extremely grateful to the contributors of this SeSAMI workshop. We thank all authors who shared their latest findings, as well as the Program Committee members, and reviewers, who all achieved quality work in a very short time. We also thank our keynote speakers, who kindly accepted our invitations: Guido Gerig, Professor at the New York University, USA, and Tom Fletcher, Professor at the University of Utah, USA.

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