

Preface

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It has been recognized by the solar-physics community that the immense volume ($> 1 \text{ TB day}^{-1}$) of complex, multi-dimensional data that will soon be delivered by the Living with a Star (LWS) mission *Solar Dynamics Observatory* (SDO) will require a set of tools to automatically and robustly extract relevant information and properties of features and events. Further, specialized image-processing techniques are also required in order to extract useful physical measurements from stereoscopic observations of optically thin solar features such as coronal loops and coronal mass ejections. The algorithms required to extract useful information on the phenomenology and physics of many different solar features lie at the intersection of computer vision, data processing, and solar physics. Recent progress and upcoming challenges in developing and implementing the required algorithms were discussed in detail at the Fourth Solar Image Processing Workshop (held at the Pier 5 Hotel in Baltimore, Maryland, 26–30 October 2008). The meeting brought together members of the solar-physics and image-processing communities to learn, compare, and discuss currently existing algorithms that make scientifically useful information on many different types of solar features reliably available to the community on a timely basis. The papers in this volume were stimulated by the topics discussed at that meeting and provide a snapshot of recent progress in implementing computer vision for the benefit of solar physics.

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