

# Preface

In order to push research and analyze the gain of multimodal methods for gesture recognition, in the period 2011–2014, ChaLearn organized a series of challenges related to gesture recognition. Our first workshop at CVPR from our 2011 challenge emphasized mostly 2D video data meanwhile our second and third workshops at CVPR, ICPR, ICMI, ECCV conferences from our 2012, 2013, and 2014 challenges were focused on affordable 3D sensors for gesture recognition research, also including audio information. In ECCV 2014 and CVPR 2015 workshops we also promoted different aspects of looking at people, including pose recovery, activity recognition, and scene understanding where humans are present. In addition to best challenge results, many research papers devoted to gesture recognition were published and presented in our challenge workshops. Our workshops and competitions were sponsored mainly by Microsoft Research, Google, Facebook, AMAZON, NVIDIA, and Disney Research. Updates of our current and upcoming events can be found at <http://gesture.chalearn.org/>

In this book we present an up to date set of works related to the automatic analysis of gestures from still images and multi-modal RGB-Depth image sequences. It presents the most comprehensive and up to date review of vision-based methods for supervised gesture recognition methods that have been validated by several challenges. Several aspects of gesture recognition are reviewed, including data acquisition from different sources, feature extraction, learning, and recognition of gestures.

Chapter 1 of the book presents an up to date comprehensive analysis on Gesture recognition, defining a new taxonomy for the field. Then, the first part of the book (Chaps. 2–9) mainly focus on supervised machine learning methods for gesture recognition. The second part of the book (Chaps. 10–16) contains works related to

the participants of ChaLearn challenges. Chapter 17 presents an open-source C++ library for real-time gesture recognition. Chapter 18 discusses two template-based methods to learn from noisy annotations provided by crowdsourcing methods. Finally, Chap. 19 reviews the most recent state of the art research involving deep learning architectures in order to deal with gesture and action recognition problems.

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