

EG 3DOR 2018

Eurographics Workshop on 3D Object Retrieval

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April 16, 2018

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Preface

The increase of 3D media as a key player across the wealth of information sources in the digital arena has continued its upwards trend in the last years. On the one hand, increasingly more powerful, fast, accurate, and affordable technologies and techniques for acquiring 3D content from the physical world, such as 3D scanners, 3D sensors, and depth cameras, have become available to both researchers and the grand public. On the other hand, the importance and interest in analyzing large databases of 3D shapes has spread from traditional applications in computer graphics to a wider spectrum of domains including medicine, bioinformatics, chemistry, security, serious gaming, and urban planning.

3D content-based retrieval has evolved from a niche technical area to a multidisciplinary application area involving researchers at the crossroads of computer graphics, shape modelling and processing, computer vision, machine learning, information systems, and practitioners in application-specific domains. Since 2008, Eurographics has hosted the 3D Object Retrieval (3DOR) workshop series dedicated to topics in the above field.

The eleventh edition of the 3DOR workshop was organized in 2018 on April 16th in Delft, Netherlands, in co-location with the Eurographics annual conference on Computer Graphics. Following the call for papers, the workshop has received 11 submissions and 6 track reports. All these have been reviewed by at least three members of the International Program Committee (IPC). Following the reviews, 8 submissions have been accepted as full presentations, and 2 papers have been accepted as short (poster) presentations. The papers cover a wide range of topics including mixed-modality retrieval, retrieval based on partial local shape information, and the usage of machine learning techniques to support shape retrieval. All accepted contributions will be included in the Eurographics Digital Library.

3DOR 2018 also hosts the 13th Shape Retrieval Contest (SHREC'18). The contest continues the effort of earlier editions for the creation of comprehensive benchmarks including retrieval methods, datasets, and related methodology for various types of 3D shape retrieval. SHREC'18 proposed six different tracks covering sketch-based and image based 3D scene retrieval, RGBD based object retrieval, protein shape retrieval, retrieval of color patterns from 3D models, and geometric pattern recognition over 3D models. All track reports contribute with detailed information on the state-of-the-art of the rapidly evolving and expanding 3D retrieval field.

As during the past edition, a special issue in a mainstream journal is planned based on extended versions of selected full papers from 3DOR 2018.

The one-day programme of 3DOR 2018 contains all above full paper, poster, and SHREC track presentations, as well as a keynote talk from Adrian Hilton (University of Surrey, UK) on 4D Vision for Human Animation and Shape Retrieval.

We would like to thank the IPC members for their reviewing effort which helped us to create a high-quality and exciting programme. We also thank the Eurographics Association for their continued support of this event, Delft University for providing all co-location facilities, and last but not least, Stefanie Behnke for her excellent support in managing the production of the workshop proceedings.

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Keynote

4D Vision for Human Animation and Shape Retrieval

Adrian Hilton

University of Surrey, UK

Abstract

Recent advances in 4D Vision have enabled the capture of temporally coherent volumetric shape representations. This talk will present recent advances in shape 4D reconstruction from multiple moving cameras and their use in animation content production. Temporally coherent 4D reconstruction and animation leverage shape matching across sequences to enable consistency and retrieval of frames with similar shape and motion. This talk will present the methods used for temporal shape matching based on the 4D shape trees and the matching of partial 4D surfaces. Recent advances in 4D shape super-resolution from a minimal set of camera views will also be presented.

Short Biography

Adrian Hilton, BSc(hons), DPhil, CEng, is Professor of Computer Vision and Graphics and Director of the Centre for Vision, Speech and Signal Processing at the University of Surrey, UK. He leads research investigating the use of computer vision for applications in entertainment content production, visual interaction and clinical analysis.

His interest is in robust computer vision to model and understand real world scenes, bridging-the-gap between real and computer generated imagery. This combines the fields of computer vision, machine learning, graphics and animation to investigate new methods for reconstruction, modelling and understanding of the real world from images and video. Applications include: sports analysis (soccer, rugby and athletics), 3D TV and film production, visual effects, character animation for games, digital doubles for film and facial animation for visual communication.

Contributions include technologies for the first hand-held 3D scanner, modeling of people from images and 3D video for games, broadcast and film production. Current research is focused on video-based measurement in sports, multiple camera systems in film and TV production, and 4D video for highly realistic animation of people and faces. Research is conducted in collaboration with UK companies and international institutions in the creative industries. Adrian is currently the Principal Investigator of the EPSRC Programme Grant S3A: 'Future Spatial Audio for Immersive Listener Experience at Home' (2013-2018) and EPSRC Platform Grant 'Audio-Visual Media Research', he also leads several EU and UK/ industry projects. Adrian currently holds a 5-year Royal Society Wolfson Research Merit Award (2013-2018).