Preface to Special Issue on 3DOR 2011

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This Special Issue of The Visual Computer Journal presents four papers that were selected among those presented at the 4th Eurographics Workshop on 3D Object Retrieval, held in Llandudno, UK, on April 04, 2011. All authors of full workshop papers were invited to submit revised and substantially extended versions of their contribution. These underwent a new review process, involving original workshop reviewers, as well as new reviewers.

The Eurographics Workshop on 3D Object Retrieval series, founded in 2008, provides a forum for state-of-the-art research in this exciting field at the intersection of Computer Vision, Computer Graphics, Machine Learning, and Human–Computer Interaction. The 3DOR series has gathered momentum and enthusiasm from the research communities addressed, and the 6th Workshop is already planned as a co-event of Eurographics 2013 in Girona, Spain. 3D ob-

ject representations are an integral part of modern computer graphics and vision applications, indispensable in domains such as computer-aided design, game development, biometrics, and film production. As the number of 3D models used in modern applications rapidly increases, the problem of creating new 3D models is rapidly shifting towards the problem of searching for existing 3D models in large data collections. To this end, the development of search mechanisms allowing for effective and efficient retrieval of 3D objects from large repositories is required.

The collection of papers appearing in this Special Issue addresses timely problems in the field, providing original solutions. A common trend among the presented works is that they consider detecting and exploiting local shape information for defining and evaluating 3D retrieval algorithms, rather than global feature vectors. Helin Dutagaci et al. deal with the problem of benchmarking 3D interest point detection algorithms. They introduce a novel evaluation approach based on a user-generated ground truth. The method can be helpful in deciding which interest point detector to employ in a retrieval system. Paul Heider et al. present a survey and evaluation of local shape descriptors. Their study considers the performance and robustness properties of several local descriptors for retrieval and classification tasks. Guillaume Lavoué presents a novel local shape descriptor. On the basis of this, both spatially sensitive and insensitive bag-of-features representations support effective global and partial shape retrieval. Sfikas et al. propose non-rigid 3D object retrieval based on conformal geometry analysis in conjunction with a tree-based representation and a custom matching function. They experimentally compare the method against current approaches and demonstrate the effectiveness of their method.

The papers present innovative approaches for 3D object retrieval and description, and foster the understanding

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of how local shape information can be effectively used for 3D shape retrieval. The newly introduced methods are compared against state-of-the-art algorithms and follow established benchmarking procedures. The results presented here are a most valuable basis for future work that will continue to exploit shape properties for 3D object retrieval.

We are in debt to all international reviewers, who dedicated their precious time using their expertise to shape the contents of this edition during a two-stage review process. We thank all authors for their contributions, and the effort made in addressing the reviewers' suggestions. Finally, our sincere thanks go to The Visual Computer Journal, for making possible this Special Issue, documenting state-of-the-art research in the field of 3D object retrieval.

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