EG 3DOR 2016

Eurographics 2016 Workshop on 3D Object Retrieval

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Workshop Chair
Alfredo Ferreira, INESC-ID Lisboa, Instituto Superior Técnico, University of Lisbon, Portugal

Programme Chairs
Andrea Giachetti, Università degli Studi di Verona, Italy
Daniela Giorgi, ISTI-CNR Institute of Information Science and Technologies, Italy

Proceedings Production Editor
Dieter Fellner (TU Darmstadt & Fraunhofer IGD, Germany)

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Dieter W. Fellner, Werner Hansmann, Werner Purgathofer, François Sillion
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Preface

These proceedings contain the contributions presented at the ninth Eurographics Workshop on 3D Object Retrieval (3DOR) held in Lisbon, Portugal, on May 8th, 2016, as a co-event of the Annual Conference of the European Association for Computer Graphics (Eurographics). Following the tradition of 3DOR, which has been a successful forum for interaction and discussion among researchers from all over the world since 2008, participants from countries as distant as United States and China attended the workshop.

The proceedings include seven research papers, selected according to the recommendations of an international Program Committee of 29 external experts in the area of 3D shape analysis and retrieval.

This year, the call for papers encouraged the submission of position papers to stimulate the discussion of ideas, methods, and trends in the workshop topics. The three position papers presented at the workshop deal with the role of 3D retrieval in natural interaction systems for 3D immersive virtual environments (Giachetti et al.); the definition of a general model of shape comparison, which includes both the data and the way the observer elaborates on them (Frosini); and the identification of seven research challenges for developing the future systems for 3D dataset navigation (Biasotti et al.).

Four technical papers cover the use of surface skeletons for effective 3D retrieval (Feng et al.); the description of the 3D shape of a protein for evaluating protein-protein docking (Fernandes and Ferreira); the mathematical definition of an edit distance between Reeb graphs which ensures robustness for 3D retrieval (Bauer et al); and the analysis of encoding techniques for local features, towards a happy medium between precision and computational cost in 3D retrieval (Tasse et al.).

As in the previous editions of 3DOR, this year's event hosted the SHape REtrieval Contest (SHREC'16). For many years, the fundamental contribution of SHREC to the research community has been the evaluation of the effectiveness of 3D shape retrieval algorithms. The proceedings include eight additional papers that detail the results of the competition.

The keynote talk presented by Simone Santini (Univeristy of Madrid) tackled the unsolved challenge of query specification for 3D object retrieval. He presented several possible approaches to defining what a persona wants from a collection of nameless 3D objects, from the integration of sketches and textual information to the use of linguistic games for creating a lexicon associated with 3D data.

The workshop chairs are grateful to the Eurographics Association for their support, and to all the reviewers for ensuring a high quality program despite the tight schedule. Special thanks are also due to Stefanie Behnke for her constant and timely support.

Finally, we hope that this workshop series continue to prove useful to all the participants, and keep setting the ground for long-term interaction and collaboration towards the identification of future research directions and potential problems in the field of 3D analysis and retrieval.

Alfredo Ferreira, Andrea Giachetti, and Daniela Giorgi

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Keynote

Where the Things Have no Name: Searching in a Lexical Vacuum

Simone Santini
Escuela Politecnica Superior
Universidad Autonoma de Madrid, Spain

Abstract

Many applications of search deal with imaging data specified by well defined lexical concepts: one searches for houses, dogs, umbrellas,... Searching and finding these things, that is: transforming the lexical specification in some visual description, can be horrendously complicated but, at least, we know what we are looking for.

When we search for 3D data, at least when we do so in the typical domains in which 3D data are used, we find ourselves in a different situation. On the one hand, the models that we have are more complete, and do, in principle, allow a better match with the user desires. On the other hand, specifying exactly what a persona wants is a problem in itself.

Consider a simple example: a data base of designs of mechanical parts. Standard parts have a name, but new ones don't, and it is necessary somehow to _describe_ what we want, using suitable graphics and/or linguistic means; a task that, in itself, may be very complicated.

In some areas, like many cultural heritage areas, there is an established technical vocabulary that can be used, but in many others it is necessary to create the suitable vocabulary before we can start specifying our queries.

In this talk, we shall discuss several possible approaches to defining what we want from a data base of nameless shapes. We shall consider the integration of sketches and textual information as well as the use of linguistic games for creating a lexicon and the association to the 3D data.

In the first case, the problem is one of integration of information: somwbody may draw a sketch of a face of an object and write next to it "cylinder" or "360" to indicate that it is a rotation surface. In the scond case, the problem is to create an agreed-upon lexicon through interaction as well as the relevant connections with the visual features of the objects