



Editorial

Foreword to the Special Issue on SMI 2016



The distinctive role of Shape Modeling International (SMI) in the context of Computer Graphics conferences is its particular focus on methods and techniques to model, design and analyze shapes in all their aspects. Started in Japan by Prof. Tosiyasu L. Kunii, honorary chair of all the SMI events, SMI was initially characterized by tracks on topological methods for shape modeling, functional and implicit representations, as well as interactive shape manipulation techniques.

Over the years, the travel of SMI conferences around the world has been cadenced by its alternations among Asia, Europe and America: Italy (2001), Canada (2002), South Korea (2003), Italy (2004), USA (2005), Japan (2006), France (2007), USA (2008), China (2009), France (2010), Israel (2011), USA (2012), United Kingdom (2013), Hong Kong (2014), France (2015). Also the topics of SMI evolved over time, with the introduction of topics related to shape semantics and reasoning on shape similarity.

SMI has a tradition in seeking co-location with other conferences: in 2004, it was organized for first time with the ACM Symposium on Solid Modeling and Applications, now evolved in the Symposium on Solid & Physical Modeling, and the co-location has been sought every time it was compatible with the alternating geographical venues.

2016 is a special year for Shape Modeling International: the conference has been organized within the scope of the first International Geometry Summit (IGS) whose role is to showcase the breadth and the impact of applied geometry. Three prominent international conferences dealing with shape and geometry have been asked to join forces and coordinate technical programs, invited speakers and related events in a coherent program. The Symposium on Geometry Processing (SGP), the Symposium on Solid & Physical Modeling (SPM) and Shape Modeling International will be held at the Freie Universität Berlin, in Germany, June 20–24, 2016.

The individual technical papers track for SMI16 received a total of 57 submissions, from all over the world. Only 19 papers were retained as accepted papers for publication in the special issue of the journal Computers and Graphics (Elsevier) devoted to the proceedings of SMI. Each paper received from three to six reviews from members of the Program Committee and underwent a two stage review process. The papers will be presented in the conference grouped into themed sessions as follows:

- Surfaces

1. Huang, Z, Ju, T. Extrinsically smooth direction fields. *Comput Graph 2016;58:109–17*.
2. Wang C, Hu X, Fu X, Liu L. Bijective spherical parametrization with low distortion. *Comput Graph 2016;58:161–71*.
3. Akleman E, Ke S, Wu Y, Kalantar N, Borhani A, Chen J. Construction with physical version of quad-edge data structures. *Comput Graph 2016;58:172–83*.

- Reconstruction and location

4. Holloway M, Grimm C, Ju T. Template-based surface reconstruction from cross-sections. *Comput Graph 2016;58:84–91*.
5. Magalhães SVG, Andrade MVA, Randolph Franklin W, Li W. PinMesh – fast and exact 3D point location queries using a uniform grid. *Comput Graph 2016;58:1–11*.
6. Lin S, Lai Y-K, Martin RR, Jin S, Cheng Z-Q. Color-aware surface registration. *Comput Graph 2016;58:31–42*.

- Splines and subdivision

7. Zhang Y, Cao J, Chen Z, Li X, Zeng X-M. B-spline surface fitting with knot position optimization. *Comput Graph 2016;58:73–83*.
8. Sarov M, Peters J. Refinable polycube G-splines. *Comput Graph 2016;58:92–101*.
9. Thaller W, Augsdörfer U, Fellner DW. Procedural mesh features applied to subdivision surfaces using graph grammars. *Comput Graph 2016;58:184–92*.

- Volumes

10. Wu J, Kramer L, Westermann R. Shape interior modeling and mass property optimization using ray-reps. *Comput Graph 2016;58:66–72*.
11. Fernández Abrevaya V, Manandhar S, Hétyro-Wheeler F, Wührer S. A 3D+t Laplace operator for temporal mesh sequences. *Comput Graph 2016;58:12–22*.
12. Faraj N, Thierry J-M, Boubekeur T. Multi-material adaptive volume remesher. *Comput Graph 2016;58:150–60*.

- Interactive modeling

13. von Radziewsky P, Eisemann E, Seidel H-P, Hildebrandt K. Optimized subspaces for deformation-based modeling and shape interpolation. *Comput Graph 2016;58:128–38*.
14. Gao B, Chen X, Li J, Zou D. Modeling interactive furniture from a single image. *Comput Graph 2016;58:102–8*.
15. Sampaio AP, Chaine R, Vidal CA, Cavalcante-Neto JB. Temporally coherent sculpture of composite objects. *Comput Graph 2016;58:118–27*.
16. Walther JU, Bærentzen JA, Aanæs H. Tangible 3D modeling of coherent and themed structures. *Comput Graph 2016;58:53–65*.

- Segmentation

17. Xi Z, Kim Y-H, Kim YJ, Lien J-M. Learning to segment and unfold polyhedral mesh from failures. *Comput Graph 2016;58:139–49*.
18. Čović L, De Floriani L, Iuricich F, Magillo P. Computing a discrete Morse gradient from a watershed decomposition. *Comput Graph 2016;58:43–52*.
19. Carlier A, Leonard K, Hahmann S, Morin G, Collins M. The 2D shape structure dataset: a user annotated open access data base. *Comput Graph 2016;58:23–30*.

Shape Modeling International not only provides a substantial part of the core technical program of the Geometry Summit – also the Fabrication and Sculpting Event (FASE), which originated with SMI several years ago, is featured as an independent component of the summit program.

In coordination with SGP and SPM, for the first time this year, Shape Modeling International features the Reproducibility Stamp award. This award is an additional recognition for authors of accepted papers who provide a complete open-source implementation of their algorithm that can be used to reproduce the results presented in every figure and table shown in the paper. We owe our congratulations to authors of the following four papers whose implementation has been approved by the Reproducibility Stamp Committee:

- Čomić L, De Floriani L, Iuricich F, Magillo P. Computing a discrete Morse gradient from a watershed decomposition. <http://dx.doi.org/10.17632/tjtw4gsw7v.1>
- Magalhães SVG, Andrade MVA, Randolph Franklin W, Li W. PinMesh – fast and exact 3D point location queries using a uniform grid. <http://dx.doi.org/10.17632/s9r3bklmjh.1>
- Huang, Z, Ju, T. Extrinsically smooth direction fields. <http://dx.doi.org/10.17632/7h827btryj.1>
- Carlier A, Leonard K, Hahmann S, Morin G, Collins M. The 2D shape structure dataset: a user annotated open access database. <http://dx.doi.org/10.17632/74w9c6h2np.1>

The SMI16 Program Chairs wish to acknowledge all the other members of the Geometry Summit Committee for their contribution to the organization of the program: Michael Floater (U Oslo), Leif Kobbelt (RWTH Aachen), Konrad Polthier (FU Berlin), Jarek Rossignac (Georgia Tech), and Wenping Wang (HKU). We also acknowledge the help of the SMI Steering Committee and the continuous support of Joaquim Jorge, Editor-in-Chief of Computers and Graphics, and all the Elsevier team for their help in making this event successful. We are grateful to Daniele Panozzo (NYU) and Marco Attene (IMATI) for initiating and running the Reproducibility Stamp process. We would also like to thank all of the members of the Program Committee as well as the Reproducibility Stamp Committee for their work.



Marc Alexa is a Professor in the Faculty of Electrical Engineering and Computer Science at the Technical University of Berlin and heads the Computer Graphics group. He is interested in creating, processing, and manufacturing shapes, as well as intuitive interfaces for these tasks. He holds a masters and Ph.D. degree in Computer Science from Darmstadt University of Technology. He

has been Technical Papers Chair for SIGGRAPH 2013, and has chaired several other committees and boards. He received an ERC Starting Grant, the Heinz Maier-Leibnitz prize, as well as other cross-disciplinary grants and awards.



Michela Spagnuolo is Research Director at CNR-IMATI. Her research interest include geometric, structural and semantic modeling of 3D objects, with emphasis on computational topology for the analysis of shapes and for the evaluation of shape similarity. She is member of the steering committee of Shape Modeling International, EG 3D Object Retrieval, and of the EG Graphics and

Cultural Heritage. She authored more than 130 reviewed papers in scientific journals and international conferences, edited two

books, and is associate editor of international journals in Computer Graphics (currently, Computers & Graphics, The Visual Computer and Computer-Aided Geometric Design). She has been elected Eurographics Fellow in 2014.

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