

The European Association for Computer Graphics  
44<sup>th</sup> Annual Conference

## **EUROGRAPHICS 2023**

Saarbrücken, Germany  
May 8 – 12, 2023

---

Organized by



**EUROGRAPHICS**  
THE EUROPEAN ASSOCIATION  
FOR COMPUTER GRAPHICS

**SIC** Saarland Informatics  
Campus

---

## State of the Art Reports

### **STARs Co-Chairs**

Adrien Bousseau, INRIA, France  
Christian Theobalt, MPI Informatics, Germany

Published by  
*The Eurographics Association and John Wiley & Sons Ltd.*  
in *Computer Graphics forum*, Volume 42 (2023), Issue 2  
ISSN 1467-8659

## Preface

Dear Readers,  
the EUROGRAPHICS State-of-the-Art Reports (STARs) provide up-to-date and comprehensive overviews of special topics of current interest related to Computer Graphics. A STAR can also address the use of Computer Graphics techniques in a different scientific discipline or in industrial practice.

This year, 12 contributions of very high quality have been submitted from all over the world: China, France, Germany, Italy, United Kingdom, United States of America, Sweden, Switzerland. Each of them was reviewed by 3 members of the international EUROGRAPHICS 2023 STAR program committee in a double-blind, two-cycle reviewing process. Six STARs have been accepted based on the recommendations of the committee. They are published in this special issue of Computer Graphics Forum.

The reports cover a wide range of research topics, including optimal transport, 3D reconstruction, speech and gesture generation, procedural and neural-based modeling, mesh processing and quality assessment. One submission was referred to the fast submission track of the Computer Graphics Forum, pending a major revision.

Each accepted STAR was presented in a 90-minute talk at the EUROGRAPHICS 2023 conference. We thank all authors and the international program committee members for their great effort and contributions.

We further thank the Conference Chair Hans-Peter Seidel, as well as the local organizers, for their advice, help and hard work in organizing the EUROGRAPHICS 2023 conference. We also wish to thank the Eurographics Association, and in particular Stefanie Behnke for all her support with the submission system and the reviewing process.

Adrien Bousseau and Christian Theobalt  
STARs Co-Chairs

## International Program Committee

Aittala, Miika - NVIDIA  
Belcour, Laurent - Intel Coporation  
Bessmeltsev, Mikhail - Université de Montréal  
Bommes, David - University of Bern  
Chaudhuri, Siddhartha - Adobe Research  
Cooper, Emily - University of California, Berkeley  
Didyk, Piotr - University of Lugano  
Digne, Julie - LIRIS - CNRS  
Ferstl, Ylva - Trinity College Dublin  
Fu, Hongbo - City University of Hong Kong  
Georgiev, Iliyan - Adobe Research  
Gkioulekas, Ioannis - Carnegie Mellon University  
Gleicher, Michael - University of Wisconsin - Madison  
Hanocka, Rana - University of Chicago  
Herholz, Philipp - ETH Zurich  
Hildebrandt, Klaus - TU Delft  
Isenberg, Tobias - Inria  
Jacobson, Alec - University of Toronto and Adobe Research  
Jarabo, Adrián - Meta Reality Labs Research  
Kellnhofer, Petr - TU Delft  
Kim, Theodore - Yale University  
Komura, Taku - University of Edinburgh  
Konaković Luković, Mina - MIT  
Livesu, Marco - IMATI CNR  
Martínez, Jonàs - Inria  
Pan, Hao - Microsoft Research Asia  
Pettre, Julien - Inria  
Pietroni, Nico - University of Technology Sydney  
Richardt, Christian - Meta Reality Labs  
Sharp, Nicholas - University of Toronto  
Sitzmann, Vincent - Massachusetts Institute of Technology  
Skouras, Melina - INRIA  
Tang, Siyu - ETH Zürich  
Tompkin, James - Brown University  
Wang, Beibei - Nanjing University of Science and Technology  
Wojtan, Chris - Institute of Science and Technology Austria (ISTA)  
Xu, Feng - Tsinghua University  
Yan, Ling-Qi - UC Santa Barbara  
Zell, Eduard - University of Bonn

## Author Index

Ahuja, Chaitanya .....	569	Kairanda, Navami .....	485
Biasotti, Silvia .....	461	Kortylewski, Adam .....	485
Bonneel, Nicolas .....	439	Kucherenko, Taras .....	569
Botsch, Mario .....	521	Manzini, Gianmarco .....	461
B R, Mallikarjun .....	485	Mitra, Niloy J. ....	545
Bunge, Astrid .....	521	Neff, Michael .....	569
Dabral, Rishabh .....	485	Nyatsanga, Simbarashe .....	569
Digne, Julie .....	439	Ritchie, Daniel .....	545
Egger, Bernhard .....	485	Schulz, Adriana .....	545
Fua, Pascal .....	485	Sorgente, Tommaso .....	461
Golyanik, Vladislav .....	485	Spagnuolo, Michela .....	461
Guerrero, Paul .....	545	Theobalt, Christian .....	485
Habermann, Marc .....	485	Tretschk, Edith .....	485
Henter, Gustav Eje .....	569	Willis, Karl D. D. ....	545
Jones, R. Kenny .....	545	Wu, Jiajun .....	545

## TABLE OF CONTENTS

### State of the Art Reports

<i>A Survey of Optimal Transport for Computer Graphics and Computer Vision</i> Nicolas Bonneel and Julie Digne	439
<i>A Survey of Indicators for Mesh Quality Assessment</i> Tommaso Sorgente, Silvia Biasotti, Gianmarco Manzini, and Michela Spagnuolo	461
<i>State of the Art in Dense Monocular Non-Rigid 3D Reconstruction</i> Edith Tretschk, Navami Kairanda, Mallikarjun B R, Rishabh Dabral, Adam Kortylewski, Bernhard Egger, Marc Habermann, Pascal Fua, Christian Theobalt, and Vladislav Golyanik	485
<i>A Survey on Discrete Laplacians for General Polygonal Meshes</i> Astrid Bunge and Mario Botsch	521
<i>Neurosymbolic Models for Computer Graphics</i> Daniel Ritchie, Paul Guerrero, R. Kenny Jones, Niloy J. Mitra, Adriana Schulz, Karl D. D. Willis, and Jiajun Wu	545
<i>A Comprehensive Review of Data-Driven Co-Speech Gesture Generation</i> Simbarashe Nyatsanga, Taras Kucherenko, Chaitanya Ahuja, Gustav Eje Henter, and Michael Neff	569