

Pacific Graphics 2023

The 31st Pacific Conference on Computer Graphics and Applications

Daejeon, South Korea
October 10 – 13, 2023

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Preface

The Pacific Graphics 2023 annual conference was held in Daejeon from October 10 to 13, 2023. The conference provides a unique opportunity for experts to present their technical contributions in computer graphics, and the full papers selected for publication in the Computer Graphics Forum journal are considered to be the most prestigious feature of the conference. Also, a selection of short papers are published in the Proceedings of Pacific Graphics 2023 and archived in the Eurographics Digital Library.

The International Program Committee (IPC) of PG2023 consisted of a group of 72 experts with a will that the committee is regularly renewed. The committee received a total of 191 full submissions, which were assigned to two IPC members as primary or secondary reviewers. We assigned up to five papers to each reviewer based on their preferences, expertise, conflicts, and automatically computed matching scores between IPC members and submitted papers. The primary and secondary reviewers in turn invited two additional tertiary reviewers on each submission.

After collecting the initial four reviews per submission, the authors had five days to consult these reviews and write a 1000-word rebuttal, addressing key questions and potential misinterpretations. Finally, all reviewers assigned to a paper read the rebuttal and all reviews and together reached an initial decision.

This year, the IPC meeting was conducted virtually through a one-week virtual asynchronous meeting and discussions between the IPC members were performed off-line by a bulletin board and other means of personal communication. Each paper had a public discussion board where IPC members contributed to discussions where they felt competent.

All papers conditionally accepted with minor revisions went through a short second review cycle, where evaluations from the primary and sometimes the secondary reviewers were taken into consideration before the final acceptance. In total, 56 papers out of the 191 full submissions were accepted with minor revisions for a 29.32 % acceptance rate, while 9 were recommended for a fast-track review process with major revisions to be considered for publication in a future issue of Computer Graphics Forum. Also, 11 papers were accepted with minor revisions for publication in the Proceedings. The papers covered a diverse range of topics, including machine learning, generative modeling, computational photography, geometry, meshes, appearance and shading, texture, rendering, 3D scans analysis, physical simulation, human animation and motion capture, simulation of clothes and crowds, editing, 3D printing, fabrication.

It is worth noting that for all submissions conflict-of-interest was managed on all levels, from reviewers, committee, advisory board, best paper committee, up to the chairs. The review process was double-blind and in case the original set of reviewers did not conclude with a decision, additional reviewers were invited to perform a full review and assist the decision process. Best papers were selected by a dedicated awards committee who selected among the top 12 papers based on overall review scores.

We would like to express our gratitude to all the members of the IPC who dedicated their time to finding tertiaries, reviewing and discussing papers, and shepherding the accepted papers undergoing the minor revision cycle. We also thank all the reviewers for providing high-quality reviews and the authors for their efforts in preparing and revising the submitted papers. We would like to thank Stefanie Behnke from Eurographics Publishing for her outstanding support even at summer time. Lastly, we appreciate the onsite conference in Deajeon, where a large part of the computer graphics community could meet face-to-face, despite some difficulties to get visa in some countries. We acknowledge the organizing team for their flexibility in these challenging times.

We are honored to present the full paper proceedings of Pacific Graphics 2023 and believe that these papers reflect the extraordinary variety of computer graphics research and its best contributions. We hope that you will find both the papers and the entire conference thought-provoking and inspiring for your future endeavors.

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Zhang, Chenxu
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Zhang, Lei
Zhang, Runze
Zhang, Song-Hai
Zhang, Ya
Zhang, Zaiwei
Zhao, Borui
Zhao, Tong
Zhou, Tongyu
Zhou, Xiaowei
Zhou, Xilong
Zhu, Junqiu
Zhu, Lei

Author Index

An, Bai Lin	e14937	Fujikawa, Junpei	e14954
Barla, Pascal	e14946	Gain, James	e14941
Baron, Jessica	e14959	Galin, Eric	e14936, e14941
Bartels, Richard H.	e14979	Galmiche, Pierre	e14934
Basset, Jean	e14946	Gao, Chengying	e14938
Bechmann, Dominique	e14932	Gao, Hongxia	e14960
Benes, Bedrich	e14936	Ghosh, Abhijeet	e14943, e14972
Bradley, Derek	e14945	Gotardo, Paulo	e14945
Bridgeman, Lewis	e14943	Gross, Markus	e14945
Brown, Michael S.	e14964	Guibas, Leonidas J.	e14963
Bénard, Pierre	e14946	Guo, Jia-Peng	e14967
Cedron, Osmar	e14980	Guo, Jie	e14973
Cen, Yunchi	e14956	Guo, Yanwen	e14973
Chandran, Prashanth	e14945	Guérin, Eric	e14936, e14941
Charrada, Tarek Ben	e14942	Hahn, David	e14957
Che, Rui	e14978	Han, Xiaoguang	e14948
Chen, Ben	e14944	He, Hao	e14940
Chen, Bing-Yu	e14950	He, Jinshen	e14971
Chen, Hongsheng	e14960	He, Yihong	e14939
Chen, Jiazhou	e14946	Heo, Hyeongjun	e14931
Chen, Jierun	e14940	Herranz, Luis	e14964
Chen, Mufan	e14973	Ho, Yi-Hsuan	e14947
Chen, Ruo-Xi	e14950	Hong, Tingfeng	e14978
Chen, Xiao Rui	e14937	Hong, Yu	e14958
Chen, Yingcong	e14940	Hossain, Ishtiaque	e14935
Chin, Hsiao-Yuan	e14950	Hu, Chenlu	e14978
Choi, Byeoli	e14961	Hu, Jiangbei	e14953
Choi, Changwoon	e14929, e14931	Huang, Haibin	e14952
Corral, Javier Vazquez	e14964	Huang, Shasha	e14960
Dang, Bowen	e14982	Huang, Zhangjin	e14933
Devkota, Sudarshan	e14955	Huang, Zhitong	e14966
Dhillon, Daljit Singh J.	e14959	Igarashi, Takeo	e14935
Diao, Junqi	e14939	Ijiri, Takashi	e14954
Dong, Yi	e14952	Jacobson, Alec	e14963
Even, Melvin	e14946	Jang, Deok-Kyeong	e14961
Fan, Chongrui	e14972	Jang, Deok-Yun	e14961
Fang, Hui	e14949	Jiang, Haiyong	e14939
Fang, Xianyong	e14971	Jin, Taeil	e14961, e14962
Fang, Zhi-Duo	e14967	Joshi, Parisha	e14959
Fellner, Dieter W.	e14977	Kaick, Oliver van	e14935
Feng, Tian	e14978	Kim, Juhyeon	e14929
Freude, Christian	e14957	Kim, Kunho	e14963
Fu, Hongbo	e14948	Kim, Sang Min	e14931
Fu, Xiao-Ming	e14967	Kim, Young Min	e14929, e14931

Author Index

Kita, Naoki	e14968	Pattanaik, Sumant	e14955
Knauthe, Volker	e14977	Patterson, Eric K.	e14959
Kou, Qi Long	e14937	Perche, Simon	e14936, e14941
Kraemer, Pierre	e14932	Peytavie, Adrien	e14936, e14941
Laga, Hamid	e14942	Qian, Yu	e14971
Lai, Shuichang	e14973	Qin, Xueying	e14976
Lee, Hyeon-ki	e14969	Rainer, Gilles	e14943
Lee, Sung-Hee	e14961, e14962	Rak, Arne	e14977
Lei, Na	e14953	Rist, Florian	e14957
Li, Chen	e14956	Samavati, Faramarz F.	e14979
Li, Frederick W. B.	e14956	Seo, Hyewon	e14934
Li, Jiachen	e14976	Shen, I-Chao	e14935, e14950
Li, Mengtian	e14952	Shih, Zen-Chung	e14947
Li, Yu Di	e14937	Simo-Serra, Edgar	e14965
Liang, Xiaohui	e14956	Song, Xiuqiang	e14976
Liang, Xinru	e14938	Su, Xiongfei	e14958
Liang, Yixun	e14940	Subr, Kartic	e14980
Liao, Jing	e14966	Sun, Jiahui	e14984
Lin, Miao	e14950	Sung, Minhyuk	e14963
Lin, Minxuan	e14952	Tabia, Hedi	e14942
Lin, Yiming	e14972	Takayama, Kenshi	e14970
Lipp, Lukas	e14957	Taketomi, Takafumi	e14970
Liu, Ruiyang	e14981	Tang, Min	e14937
Liu, Xiyao	e14949	Teng, Yiqing	e14951
Liu, Yang	e14949	Tong, Ruo Feng	e14937
Liu, Yifan	e14973	Umetani, Nobuyuki	e14983
Liu, Zheng	e14944, e14953	Uy, Mikaela Angelina	e14963
Liu, Zhengyi	e14971	Viville, Paul	e14932
Lochner, Joshua	e14941	Wan, Pengfei	e14952
Luo, Zhongjin	e14948	Wang, Beibei	e14974, e14975
Luo, Zhongxuan	e14953	Wang, He	e14982
Ma, Chongyang	e14952	Wang, Jiayu	e14930
Ma, Jianliang	e14960	Wang, Linbo	e14971
Ma, Xiaowen	e14978	Wang, Lu	e14975
Ma, Xikai	e14951	Wang, Nan	e14976
Madono, Koki	e14965	Wang, Shengfa	e14953
Maeda, Ryota	e14970	Wang, Victoria	e14949
Memery, Sean	e14980	Wang, Xinyu	e14978
Mo, Haoran	e14938	Way, Der-Lor	e14947
Moroto, Yuji	e14983	Wimmer, Michael	e14957
Mossman, Christopher	e14979	Wirth, Tristan	e14977
Nah, Jae-Ho	e14969	Wu, Wenming	e14984
Otto, Christopher	e14945	Xiang, Jinxu	e14981
Paschalidou, Despoina	e14963	Xiao, Chunxia	e14944

Author Index

Xiao, Jun	e14939	Zhang, Hangyu	e14974
Xiao, Shishi	e14940	Zhang, Jian	e14949
Xiao, Yanyang	e14967	Zhang, Ling	e14944
Xie, Weijian	e14976	Zhang, Ran	e14981
Xu, Feihu	e14958	Zhang, Wei	e14978
Xu, Renjing	e14930	Zhang, Yanning	e14964
Xu, Xiaofeng	e14975	Zhang, Zhiyuan	e14966
Xue, Danna	e14964	Zhang, Ziyi	e14930
Yang, Bailin	e14956	Zhao, Bowen	e14981
Yang, Dongseok	e14961	Zhao, Jieyu	e14951
Yang, Shuang Cai	e14937	Zhao, Xi	e14982
Yang, Ting	e14949	Zheng, Changxi	e14981
Yang, Weipeng	e14960	Zheng, Liping	e14984
Yang, Yun	e14937	Zheng, Yuhao	e14949
Yao, Li	e14937, e14951	Zhong, Fan	e14976
Ye, Juntian	e14958	Zhou, Jie	e14948
Yu, Jingyi	e14981	Zhu, Pengfei	e14973
Yu, Qian	e14948	Zhu, Xinding	e14946
Yuan, Xin	e14958	Zoss, Gaspard	e14945
Zhang, Bowen	e14982	Zou, Wenbin	e14960
Zhang, Gaofeng	e14976, e14984		

TABLE OF CONTENTS

Neural Rendering

- IBL-NeRF: Image-Based Lighting Formulation of Neural Radiance Fields* e14929
Changwoon Choi, Juhyeon Kim, and Young Min Kim
- Learning to Generate and Manipulate 3D Radiance Field by a Hierarchical Diffusion Framework with CLIP Latent* e14930
Jiaxu Wang, Ziyi Zhang, and Renjing Xu
- Robust Novel View Synthesis with Color Transform Module* e14931
Sang Min Kim, Changwoon Choi, Hyeongjun Heo, and Young Min Kim

Geometry

- Meso-Skeleton Guided Hexahedral Mesh Design* e14932
Paul Viville, Pierre Kraemer, and Dominique Bechmann
- A Surface Subdivision Scheme Based on Four-Directional S_3^1 Non-Box Splines* e14933
Zhangjin Huang
- Groupwise Shape Correspondence Refinement with a Region of Interest Focus* e14934
Pierre Galmiche and Hyewon Seo

Procedural Modeling and Model Extraction

- Data-guided Authoring of Procedural Models of Shapes* e14935
Ishtiaque Hossain, I-Chao Shen, Takeo Igarashi, and Oliver van Kaick
- Authoring Terrains with Spatialised Style* e14936
Simon Perche, Adrien Peytavie, Bedrich Benes, Eric Galin, and Eric Guérin

Cloth Simulation

- D-Cloth: Skinning-based Cloth Dynamic Prediction with a Three-stage Network* e14937
Yu Di Li, Min Tang, Xiao Rui Chen, Yun Yang, Ruo Feng Tong, Bai Lin An, Shuang Cai Yang, Yao Li, and Qi Long Kou
- Controllable Garment Image Synthesis Integrated with Frequency Domain Features* e14938
Xinru Liang, Haoran Mo, and Chengying Gao
- Combating Spurious Correlations in Loose-fitting Garment Animation Through Joint-Specific Feature Learning* e14939
Junqi Diao, Jun Xiao, Yihong He, and Haiyong Jiang

Modeling by Learning

- CP-NeRF: Conditionally Parameterized Neural Radiance Fields for Cross-scene Novel View Synthesis* e14940
Hao He, Yixun Liang, Shishi Xiao, Jierun Chen, and Yingcong Chen
- Interactive Authoring of Terrain using Diffusion Models* e14941
Joshua Lochner, James Gain, Simon Perche, Adrien Peytavie, Eric Galin, and Eric Guérin
- Structure Learning for 3D Point Cloud Generation from Single RGB Images* e14942
Tarek Ben Charrada, Hamid Laga, and Hedi Tabia

TABLE OF CONTENTS

Face Reconstruction

- Neural Shading Fields for Efficient Facial Inverse Rendering* e14943
Gilles Rainer, Lewis Bridgeman, and Abhijeet Ghosh
- Facial Image Shadow Removal via Graph-based Feature Fusion* e14944
Ling Zhang, Ben Chen, Zheng Liu, and Chunxia Xiao
- A Perceptual Shape Loss for Monocular 3D Face Reconstruction* e14945
Christopher Otto, Prashanth Chandran, Gaspard Zoss, Markus Gross, Paulo Gotardo, and Derek Bradley

Sketch-based Modeling

- Efficient Interpolation of Rough Line Drawings* e14946
Jiazhou Chen, Xinding Zhu, Melvin Even, Jean Basset, Pierre Bénard, and Pascal Barla
- Sharing Model Framework for Zero-Shot Sketch-Based Image Retrieval* e14947
Yi-Hsuan Ho, Der-Lor Way, and Zen-Chung Shih
- GA-Sketching: Shape Modeling from Multi-View Sketching with Geometry-Aligned Deep Implicit Functions* e14948
Jie Zhou, Zhongjin Luo, Qian Yu, Xiaoguang Han, and Hongbo Fu

Virtual Humans

- Semantics-guided Generative Diffusion Model with a 3DMM Model Condition for Face Swapping* e14949
Xiyao Liu, Yang Liu, Yuhao Zheng, Ting Yang, Jian Zhang, Victoria Wang, and Hui Fang
- Palette-Based and Harmony-Guided Colorization for Vector Icons* e14950
Miao Lin, I-Chao Shen, Hsiao-Yuan Chin, Ruo-Xi Chen, and Bing-Yu Chen
- Multi-Level Implicit Function for Detailed Human Reconstruction by Relaxing SMPL Constraints* e14951
Xikai Ma, Jieyu Zhao, Yiqing Teng, and Li Yao
- Multi-Modal Face Stylization with a Generative Prior* e14952
Mengtian Li, Yi Dong, Minxuan Lin, Haibin Huang, Pengfei Wan, and Chongyang Ma

Computational Fabrication

- An Efficient Self-supporting Infill Structure for Computational Fabrication* e14953
Shengfa Wang, Zheng Liu, Jiangbei Hu, Na Lei, and Zhongxuan Luo
- Fabricatable 90° Pop-ups: Interactive Transformation of a 3D Model into a Pop-up Structure* e14954
Junpei Fujikawa and Takashi Ijiri

Volumetric Reconstruction

- Efficient Neural Representation of Volumetric Data using Coordinate-Based Networks.* e14955
Sudarshan Devkota and Sumant Pattanaik
- A Differential Diffusion Theory for Participating Media* e14956
Yunchi Cen, Chen Li, Frederick W. B. Li, Bailin Yang, and Xiaohui Liang

TABLE OF CONTENTS

<i>Precomputed Radiative Heat Transport for Efficient Thermal Simulation</i> Christian Freude, David Hahn, Florian Rist, Lukas Lipp, and Michael Wimmer	e14957
Imaging	
<i>Multi-scale Iterative Model-guided Unfolding Network for NLOS Reconstruction</i> Xiongfei Su, Yu Hong, Juntian Ye, Feihu Xu, and Xin Yuan	e14958
<i>Robust Distribution-aware Color Correction for Single-shot Images</i> Daljit Singh J. Dhillon, Parisha Joshi, Jessica Baron, and Eric K. Patterson	e14959
<i>Enhancing Low-Light Images: A Variation-based Retinex with Modified Bilateral Total Variation and Tensor Sparse Coding</i> Weipeng Yang, Hongxia Gao, Wenbin Zou, Shasha Huang, Hongsheng Chen, and Jianliang Ma	e14960
Motion Capture and Generation	
<i>MOVIN: Real-time Motion Capture using a Single LiDAR</i> Deok-Kyeong Jang, Dongseok Yang, Deok-Yun Jang, Byeoli Choi, Taeil Jin, and Sung-Hee Lee	e14961
<i>DAFNet: Generating Diverse Actions for Furniture Interaction by Learning Conditional Pose Distribution</i> Taeil Jin and Sung-Hee Lee	e14962
<i>OptCtrlPoints: Finding the Optimal Control Points for Biharmonic 3D Shape Deformation</i> Kunho Kim, Mikaela Angelina Uy, Despoina Paschalidou, Alec Jacobson, Leonidas J. Guibas, and Minhyuk Sung	e14963
Image Editing and Color	
<i>Integrating High-Level Features for Consistent Palette-based Multi-image Recoloring</i> Danna Xue, Javier Vazquez Corral, Luis Herranz, Yanning Zhang, and Michael S. Brown	e14964
<i>Data-Driven Ink Painting Brushstroke Rendering</i> Koki Madono and Edgar Simo-Serra	e14965
<i>Continuous Layout Editing of Single Images with Diffusion Models</i> Zhiyuan Zhang, Zhitong Huang, and Jing Liao	e14966
Images, Vectorization, and Layouts	
<i>Error-bounded Image Triangulation</i> Zhi-Duo Fang, Jia-Peng Guo, Yanyang Xiao, and Xiao-Ming Fu	e14967
<i>Dissection Puzzles Composed of Multicolor Polyominoes</i> Naoki Kita	e14968
<i>H-ETC2: Design of a CPU-GPU Hybrid ETC2 Encoder</i> Hyeon-ki Lee and Jae-Ho Nah	e14969
Details and Styles on 3D Models	
<i>Refinement of Hair Geometry by Strand Integration</i> Ryota Maeda, Kenshi Takayama, and Takafumi Taketomi	e14970

TABLE OF CONTENTS

<i>Fine Back Surfaces Oriented Human Reconstruction for Single RGB-D Images</i> Xianyong Fang, Yu Qian, Jinshen He, Linbo Wang, and Zhengyi Liu	e14971
Learning-based Reflectance	
<i>Deep Shape and SVBRDF Estimation using Smartphone Multi-lens Imaging</i> Chongrui Fan, Yiming Lin, and Abhijeet Ghosh	e14972
<i>SVBRDF Reconstruction by Transferring Lighting Knowledge</i> Pengfei Zhu, Shuichang Lai, Mufan Chen, Jie Guo, Yifan Liu, and Yanwen Guo	e14973
Dynamic Scenes	
<i>World-Space Spatiotemporal Path Resampling for Path Tracing</i> Hangyu Zhang and Beibei Wang	e14974
<i>Efficient Caustics Rendering via Spatial and Temporal Path Reuse</i> Xiaofeng Xu, Lu Wang, and Beibei Wang	e14975
<i>3D Object Tracking for Rough Models</i> Xiuqiang Song, Weijian Xie, Jiachen Li, Nan Wang, Fan Zhong, Guofeng Zhang, and Xueying Qin	e14976
Learning and Image Processing	
<i>A Post Processing Technique to Automatically Remove Floater Artifacts in Neural Radiance Fields</i> Tristan Wirth, Arne Rak, Volker Knauth, and Dieter W. Fellner	e14977
<i>MAPMaN: Multi-Stage U-Shaped Adaptive Pattern Matching Network for Semantic Segmentation of Remote Sensing Images</i> Tingfeng Hong, Xiaowen Ma, Xinyu Wang, Rui Che, Chenlu Hu, Tian Feng, and Wei Zhang	e14978
<i>Balancing Rotation Minimizing Frames with Additional Objectives</i> Christopher Mossman, Richard H. Bartels, and Faramarz F. Samavati	e14979
Radiance and Appearance	
<i>Generating Parametric BRDFs from Natural Language Descriptions</i> Sean Memery, Osmar Cedron, and Kartic Subr	e14980
<i>Neural Impostor: Editing Neural Radiance Fields with Explicit Shape Manipulation</i> Ruiyang Liu, Jinxu Xiang, Bowen Zhao, Ran Zhang, Jingyi Yu, and Changxi Zheng	e14981
<i>Reconstructing 3D Human Pose from RGB-D Data with Occlusions</i> Bowen Dang, Xi Zhao, Bowen Zhang, and He Wang	e14982
Color Harmonization on Images	
<i>Fast Grayscale Morphology for Circular Window</i> Yuji Moroto and Nobuyuki Umetani	e14983
<i>BubbleFormer: Bubble Diagram Generation via Dual Transformer Models</i> Jiahui Sun, Liping Zheng, Gaofeng Zhang, and Wenming Wu	e14984

Keynote

View- and Temporal-consistency in Generation using Diffusion Models

Niloy Mitra

University College London

Abstract

Recently, diffusion models are the best-performing 2D generative model. This is due to their ability to be trained on millions, if not billions, of images with a stable learning objective. However, adapting these models to 3D (or video) has proven to be challenging for two reasons. Firstly, obtaining a large quantity of 3D (or video) training data is much more complex than obtaining 2D images, and in practice, only tens of thousands of such training samples are available. Secondly, while extending the models to operate on 3D grids (spatial or temporal) is theoretically simple, the associated cubic growth in memory and compute complexity makes this impractical.

To address the first challenge, we have introduced a new diffusion setup that can be trained end-to-end, with only posed 2D images for supervision. Furthermore, we have tackled the second challenge by proposing an image formation model that decouples model memory from spatial memory. During this talk, I will describe results using synthetic and real data and discuss how we can extend these models to produce high-quality photorealistic outputs. I will also present a diffusion-based workflow for video data producing time-consistent stylization.

Short Biography

Niloy J. Mitra leads the Smart Geometry Processing group in the Department of Computer Science at University College London and the Adobe Research London Lab. He received his Ph.D. from Stanford University under the guidance of Leonidas Guibas. His research focuses on developing machine learning frameworks for generative models for high-quality geometric and appearance content for CG applications. Niloy's technical contributions in the field of computer graphics have earned him numerous prestigious awards. He was awarded the Eurographics Outstanding Technical Contributions Award in 2019, the British Computer Society Roger Needham Award in 2015, and the ACM SIGGRAPH Significant New Researcher Award in 2013. Furthermore, he was elected as a fellow of Eurographics in 2021 and served as the Technical Papers Chair for SIGGRAPH in 2022. His work has also earned him a place in the SIGGRAPH Academy in 2023. Besides research, Niloy is an active DIYer and loves reading, cricket, and cooking. More information: <https://geometry.cs.ucl.ac.uk>

Keynote

A Decade of Advancements in Functional Maps: From Inception to Recent Breakthroughs

Maks Ovsjanikov

École Polytechnique

Abstract

In this talk, I will share the journey of Functional Maps from their introduction to the latest developments. I will first discuss the foundations of this framework, describing its key motivations and basic properties. I will then provide a brief history of how the approaches based on Functional Maps have developed over the past ten years. Finally, I will provide a brief overview of some open problems and promising directions. Throughout the talk, I will try to emphasize especially the collective efforts of researchers who have contributed and continue to contribute to the development and growth of Functional Maps over the past decade.

Short Biography

Maks Ovsjanikov is a Professor at Ecole Polytechnique in France. He works on 3D shape analysis with emphasis on deep learning techniques for shape matching and comparison. He obtained his PhD from Stanford University under the supervision of Prof. Leonidas Guibas. He has received a Eurographics Young Researcher Award, an ERC Starting Grant, a CNRS Bronze Medal (a recognition for junior researchers in France) and an ERC Consolidator Grant in 2023. His works have received 11 best paper awards or nominations at top conferences, including CVPR, ICCV, 3DV, etc., while his work on Functional Maps has received a SIGGRAPH Test-of-Time Award in 2023. More information: <https://www.lix.polytechnique.fr/maks/>

Keynote

Evaluating the Realism of Animated Character Motion

Carol O'Sullivan

Trinity College Dublin

Abstract

Recent years have seen great advances in character animation. The combination of data-driven and physics-based methods in particular, together with machine learning, has enabled the simulation of virtual humans that move around and interact naturally within a virtual environment. However, there is still much scope for research into methods and metrics for evaluating the realism and naturalness of such simulated animations. Furthermore, the simulation and evaluation of virtual humans interacting in Mixed Reality raises many interesting research questions. In this talk, I will present a review of relevant research to date and pose some questions for the future.

Short Biography

Carol O'Sullivan is the Professor of Visual Computing in Trinity College Dublin. From 2013-2016 she was a Senior Research Scientist at Disney Research in Los Angeles, and spent a sabbatical year as Visiting Professor in Seoul National University from 2012-2013. Prior to her PhD studies, she spent several years in industry working in Software Development. She joined TCD as a lecturer in 1997 and served as the Dean of Graduate Studies from Jul'2007 to Jul'2010. She was elected a fellow of Trinity College in 2003 and of the European Association for Computer Graphics (Eurographics) in 2007. Her research interests include graphics and perception, animation, and crowd and human simulation. She has managed a range of projects with significant budgets during that time and successfully supervised many doctoral and post-doctoral researchers. She has been a member of many editorial boards and international program committees (including ACM SIGGRAPH and Eurographics). She is currently the Editor in Chief of the ACM Transactions on Graphics and previously served as Editor in Chief for the ACM Transactions on Applied Perception from 2006-2012. Recently, she has served as the Technical Papers chair for ACM SIGGRAPH Asia 2021 and the Courses chair for SIGGRAPH Asia 2018.