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.

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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.

Pacific Graphics 2023 Program Co-Chairs

Raphaëlle Chaine, LIRIS, Université Lyon 1, CNRS, France
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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

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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/

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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.