Eurographics Symposium on Rendering 2022

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CHARLES UNIVERSITY

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A. Ghosh and L.-Y. Wei
(Guest Editors)

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Preface

Welcome to the 33rd Eurographics Symposium on Rendering, from July 4th to July 6th 2022 as a hybrid conference with physical gathering in Prague, Czech Republic and remote participation via video conferencing and messaging apps. The symposium has received 47 research-track submissions and 4 industry-track submissions, from which an international committee of experts selected 15 CGF (journal-track) papers, 12 symposium-track papers, and 3 industry papers for the final program. These papers represent a diverse range of topics in rendering, including lighting, illumination, sampling, noise, pattern, volumes, materials, machine learning, high performance computing, and stylized effects. Additional presentations include 6 CGF papers and 3 keynotes covering the frontier of rendering, such as black hole imaging, neural scene representation, and decentralized computing.

We hope you will enjoy both the technical content and social interactions of the symposium!

Abhijeet Ghosh and Li-Yi Wei
Program Co-Chairs

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Keynote

Beyond the First Portrait of Our Milky Way's Black Hole

Katie Bouman

Abstract

As imaging requirements become more demanding, we must rely on increasingly sparse and/or noisy measurements that fail to paint a complete picture. Computational imaging pipelines, which replace optics with computation, have enabled image formation in situations that are impossible for conventional optical imaging. For instance, the first black hole image – published in 2019 of the black hole in the M87 galaxy – and the recent second portrait of our Milky Way's supermassive black hole published in 2022, were only made possible through the development of computational imaging pipelines that worked alongside an Earth-sized distributed telescope. However, remaining scientific questions motivate us to improve this computational telescope to see black hole phenomena still invisible to us. This talk will describe how the first images of a black hole were computationally captured, and discuss how we are developing techniques that will allow us to extract the evolving structure of our own Milky Way's black hole over the course of a night, perhaps even in three dimensions, in the future.

Short Biography

Katherine L. (Katie) Bouman is an assistant professor in the Computing and Mathematical Sciences, Electrical Engineering, and Astronomy Departments at the California Institute of Technology. Before joining Caltech, she was a postdoctoral fellow in the Harvard-Smithsonian Center for Astrophysics. She received her Ph.D. in the Computer Science and Artificial Intelligence Laboratory (CSAIL) at MIT in EECS, and her bachelor's degree in Electrical Engineering from the University of Michigan. She is a Rosenberg Scholar, Heritage Medical Research Institute Investigator, recipient of the Royal Photographic Society Progress Medal, and co-recipient of the Breakthrough Prize in Fundamental Physics.

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Keynote

Efficient Neural Scene Representation, Rendering, and Generation

Gordon Wetzstein

Abstract

Neural radiance fields and scene representation networks offer unprecedented capabilities for photorealistic scene representation, view interpolation, and many other tasks. In this talk, we discuss expressive scene representation network architecture, efficient neural rendering approaches, and generalization strategies that allow us to generate photorealistic multi-view-consistent humans or cats using state-of-the-art 3D GANs.

Short Biography

Gordon Wetzstein is an Associate Professor of Electrical Engineering and, by courtesy, of Computer Science at Stanford University. He is the leader of the Stanford Computational Imaging Lab and a faculty co-director of the Stanford Center for Image Systems Engineering. At the intersection of computer graphics and vision, computational optics, and applied vision science, Prof. Wetzstein's research has a wide range of applications in next-generation imaging, display, wearable computing, and microscopy systems. Prior to joining Stanford in 2014, Prof. Wetzstein was a Research Scientist at MIT, he received a Ph.D. in Computer Science from the University of British Columbia in 2011 and graduated with Honors from the Bauhaus in Weimar, Germany before that. He is the recipient of an NSF CAREER Award, an Alfred P. Sloan Fellowship, an ACM SIGGRAPH Significant New Researcher Award, a Presidential Early Career Award for Scientists and Engineers (PECASE), an SPIE Early Career Achievement Award, a Terman Fellowship, an Okawa Research Grant, the Electronic Imaging Scientist of the Year 2017 Award, an Alain Fournier Ph.D. Dissertation Award, and a Laval Virtual Award as well as Best Paper and Demo Awards at ICCP 2011, 2014, and 2016 and at ICIP 2016.

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Keynote

Rendering the Open Metaverse

Jules Urbach

Abstract

In the coming decade, rendering technologies will be at the forefront of a revolution in informatics. As we move from hypertext and hypermedia to a fully immersive metaverse built on complex interactive 3D scenes, the next generation of the web will be driven by rendering intensive applications. This talk will discuss how a decentralized and open global rendering system is foundational for disruptive services and platforms to evolve from the post-mobile world of immersive computing. It will examine the use of rendering in web3 applications such as NFTs (non-fungible tokens) and explore how OTOY's Render Network is working to achieve the aims of an open, decentralized metaverse.

Short Biography

CEO and founder of RNDR — a decentralized rendering software that uses the Ethereum blockchain for distributed cloud rendering of digital graphics and special effects — is a pioneer in computer graphics, streaming, and 3D rendering, with more than 25 years of industry experience. His company is building the foundation for next-level metaverse graphics, allowing individuals to create renders and other works at the same level as Hollywood studios.