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ICAT - EGVE

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28th Eurographics Symposium on Virtual Environments

Posters & Demos

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Keynote

Perception of Digital Avatars and Agents in the Metaverse

Rachel McDonnell, Trinity College Dublin

Abstract

Recent developments in digital human technologies enable communication with ever more realistic characters in immersive virtual environments. These digital avatars require human motion data to be tracked using tracking systems such as VR headsets and controllers. Research going back to the 1970s has shown that this biological motion data that we are tracking is rich in psychological information such as social categories, emotional states, intentions, and underlying dispositions. In this talk, I will discuss research that I have conducted over the years on the perception of digital humans, with a focus on how congruent and incongruent motion and morphologies are perceived. I will also discuss the implications for avatar-based interactions and virtual agents in the 'Metaverse', as technology develops, and motion capture data becomes more accessible to all.

Short Biography

Dr Rachel McDonnell is Associate Professor in Creative Technologies at Trinity College Dublin and fellow of Trinity College Dublin. She has been a member of a number of editorial boards and international program committees of top conferences such as ACM SIGGRAPH, Eurographics, and IEEE Virtual Reality, and has been program chair for conferences including the ACM Symposium on Applied Perception, ACM/SIGGRAPH Conference on Motion, Interaction, and Games, and the Eurographics STARs Programme. Her main research interests are Computer Graphics, Perception, Virtual Humans and Virtual Reality. She combines research in cutting-edge computer graphics and investigating the perception of virtual characters to both deepen our understanding of how virtual humans are perceived, and directly provide new algorithms and guidelines for industry developers on where to focus their efforts.

Keynote

Volumetric Content Creation for Immersive XR Experiences

Aljosa Smolic, Hochschule Luzern

Abstract

Volumetric reconstruction addresses creation of 3D models as known from computer graphics from real world objects and scenes. Popular terms used in this context include photogrammetry or 3D scanning for the static case, and volumetric video or holograms for the dynamic case. Solutions have reached a high level of maturity and are widely used to bring real world content into eXtended Reality (XR), games, media, the metaverse and other applications. Recent advances in machine learning such as Neural Radiance Fields (NeRF) disrupted this research field providing impressive visual results. The talk will highlight technology for volumetric content creation for static scenes and objects as well as for humans in motion as dynamic cases. It will further showcase a variety of creative experiments applying volumetric reconstruction for immersive storytelling in XR.

Short Biography

Prof. Dr. Aljosa Smolic is Professor in the Computer Science Department of Hochschule Luzern in Switzerland and Co-Head of the Immersive Realities Research Lab. Before he was Professor of Creative Technologies at Trinity College Dublin heading the research group V-SENSE, Senior Research Scientist and Group Leader at Disney Research Zurich, and Scientific Project Manager and Group Leader at Fraunhofer HHI. He is also a Co-Founder of the company Volograms, which commercializes volumetric video technology. Prof. Smolic's expertise is in the broad area of visual computing (covering image/video processing, computer vision, computer graphics) with a focus on immersive XR technologies. He has published 250+ scientific papers and book chapters, holds 35+ patents and received several awards and recognitions for his research, including the IEEE ICME Star Innovator Award 2020 for his contributions to volumetric video content creation. Prof. Smolic served as Associate Editor of the IEEE Transactions on Image Processing and the Signal Processing: Image Communication journal. He was Guest Editor for the Proceedings of the IEEE, IEEE Transactions on CSVT, IEEE Signal Processing Magazine, and other scientific journals.

Keynote

Delivering Intelligent Telexistence in Virtual Worlds with Everyone

Kenny Mitchell, Edinburgh Napier University

Abstract

This talk will present experiences and thoughtful strategies of delivering research into mass appeal interactive virtual worlds from 3d multiplayer streaming immersion in the rich story worlds of Harry Potter with Electronic Arts to generative digital twins from aerial LiDAR scanning with Cobra Simulation Ltd. Developing techniques for believable digital actors and theme park motion rides for Star Wars with Disney Research. Defining scalable rendering for dynamic visual world creation of the metaverse for Roblox. And finally, with Edinburgh Napier University and 3Finery Ltd launching new emotional conversational AI personalities in Intermediated Reality and finally, and exploring the challenge of effective presence in online dancing with a current European FET PROACT project CAROUSEL #101017779 with an open source system called DanceGraph.

Short Biography

Prof. Kenny Mitchell is chair of Video Game Technology at Edinburgh Napier University providing graphics solutions for video games, immersive technology and media. Dr. Mitchell leads technical developments into various video games, movies, and consumer products, including “Harry Potter”, “Roblox”, “Star Wars: Rogue One”, “Pirates of the Caribbean”, and “Finding Dory”; and holds over 40 patents in computer graphics and motion capture. Prof. Mitchell is currently the co-Editor-in-Chief for ACM Games: Research and Practice, and Associate Editor for ACM Computer Graphics and Interactive Techniques and Elsevier Computers and Graphics journals.