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Editorial

Foreword to the special section on Computer Graphics education in the time of Covid

The Covid-19 pandemic has profoundly affected society worldwide and forced Universities and other Higher Education institutions to move their programs online almost overnight; students and faculty had to adapt to this new reality and had to accomplish their activities in very different conditions without any specific planning or training. This was naturally more problematic for some courses and topics than for others; Computer Graphics and related courses (e.g. Visualization, Virtual Reality, and Visual Computing) may have been particularly challenging as they involve very specific Hardware and Software that students typically only have access to on their institutions' premises. Nevertheless, this also brought opportunity to institutions, which should be better prepared to face new challenges, and perhaps to leverage this experience to foster a hybrid model of education with significant benefits. The call for this special section solicited papers identifying and debating issues, presenting solutions, guidelines, and lessons learned based on the experience gained during these extraordinary times.

Together with an international program committee, consisting of 18 experts in Computer Graphics and Related Subjects, we handled a competitive and selective review process. Two manuscripts, from six submissions, received the highest marks through the reviewing process. Each of these two papers cycled through two more reviews. The selected papers cover two different areas – computer graphics/advanced rendering and computer graphics/computer vision – with both papers providing a complete overview of a modern approach to teaching these subject areas as well as a comparison of teaching methods in pre-pandemic and pandemic conditions.

Rui Rodrigues, Teresa Matos, Alexandre Valle de Carvalho, Jorge G. Barbosa, Rodrigo Assaf, Rui Nóbrega António Coelho and Augusto Sousa [1] describe the challenge of covering subjects in depth and creating learning material that is appealing, visual and interactive for a modern Computer Graphics course within a limited time frame. By structuring the process into different components needed for such a course (e.g., selecting communication and development tools that aid the process of teaching and mentoring) already in pre-pandemic times, the authors then mapped these components to the possibilities/necessities of an online course when online teaching became a requirement. The article explains the outline of the whole course as well as features and tools used for the COVID online courses. Student feedback over four years (with the last one being the COVID online courses) showed no regression in the perceived course quality.

The paper by Masaru Ohkawara, Hideo Saito and Issei Fujishiro [2] is of high interest to educators transitioning from teaching computer graphics to teaching visual computing: it describes a framework for teaching visual computing (in a pre-pandemic version) that already contained important elements (such as cloud-based computing) to meet the essential high-performance requirements for each student in their practical assignments. This approach allowed moving GPU intensive projects, such as the assignments on GPU path tracing – explained in detail – unchanged into the online teaching version in 2020. Student evaluation shows that the perceived quality of online teaching was similar to, and in some cases better than the pre-pandemic course.

This special section would not have been possible without the efforts of many people. We are grateful for the work of the authors, reviewers and the Graphics and Visual Computing Editor in Chief, Joaquim Jorge. Our thanks go also to the Elsevier professionals for their help with the submission and review system. We hope that all this work, resulting in the articles included in this special section, will be useful to the many Computer Graphics educators who struggle to reinvent their courses to ensure that Computer Scientists and Engineers of the future receive the same quality of education despite the extraordinary circumstances we are currently experiencing.

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Gitta Domik is professor at the Department of Computer Science at the University of Paderborn, Germany, heading the research group of Computer Graphics and Visualization. Before joining the University of Paderborn in 1993, she was a research assistant professor at the Department of Computer Science at the University of Colorado at Boulder, USA. Before, she was with the Center for Astrophysics and Space Astronomy at the University of Colorado (1987–1990), at Vexcel Corporation in Boulder (1985–1987), and the research center Joanneum (1982–1985) in Graz, Austria. She graduated from the Technical University Graz, Austria, with a PhD in 1985. She is a Senior Member of both IEEE and ACM and held the Teaching Excellence ("Weierstraß") Award of her faculty at the University of Paderborn twice (in 2002 and 2020). She acted as co-chair for the Education Program at Eurographics, most recently for EG2021.

Eike Falk Anderson is Principal Academic (lecturer) in game Development at the National centre for Computer Animation, Bournemouth University, UK, where he received his PhD in Computer Animation in 2008. Between 2008 and 2012 he held the position of Senior Lecturer in Computer Games Technology at Coventry University, UK. He is a Fellow of the Higher Education Academy and member of the ACM, ACM SIGGRAPH and the Eurographics Association. For the latter, he currently serves as a member of the Education Board. His-research involves the development of methods and techniques for the creation of interactive virtual environments, and related to this, the use of computer games technology for cultural heritage applications.