Foreword: Special Section on the Eurographics Workshop on Visual Computing for Biology and Medicine (EG VCBM) 2019

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Editorial

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We are very pleased to present this special section of the Computers and Graphics Journal (C&G). It features six articles within the scope of the EG Workshop on Visual Computing for Biology and Medicine, which took place for the 9th time on September 4–6, 2019, in Brno, Czech Republic. At the workshop, 16 full papers, 2 surveys, and 11 short papers were presented, addressing the state of the art in visual computing research with a strong focus on applications in biology and medicine. The presented papers covered relevant and innovative visual computing solutions for medicine, healthcare, and the biotechnology sector by integrating elements from visualization, visual analytics, computer graphics, image processing, computer vision, and human-computer interfaces, guided by domain expertise in biology and medicine.

For this special section of C&G on Visual Computing for Biology and Medicine, we solicited significantly extended and revised versions (at least 30% of additional material) of full papers presented at VCBM 2019, as well as original works and surveys related to the VCBM topics. All submissions have been fully peer-reviewed by at least three experts according to the standards of Computers and Graphics, drawing on members of the VCBM program committee, and on additional researchers in the field. Consequently, we accepted the six papers that are now collected in this special section. The section includes a survey on medical animation, covering applications in medical education, diagnosis, treatment planning and forensics [1], one paper that proposes a novel approach for the visual exploration of large normal mode spaces to study protein flexibility [2], one paper presenting a complete system for the data extraction and visual exploration of colon contents and morphological data [3], and three visual analytics papers, addressing the exploration and analysis of pelvic organ variability in cohorts of patients undergoing radiotherapy [4], the interactive exploration of metabolite signatures in MR spectroscopy studies [5], and explainability in clinical decision support, inspired by decision making within clinical routine [6].

The VCBM workshop and, by extension, this special section would not have been possible without the hard work of all authors, and the members of our program committee. Additionally, we gratefully acknowledge the full, short, and poster co-chairs for their help, work, and support of this event.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Barbora Kozlíková is associate professor at the Masaryk University in Brno, Czech Republic, where she obtained her Ph.D. degree in 2011. Her main research interests are molecular visualization and visual analysis. She is the head of the visualization VisitLab laboratory at the Masaryk University. She obtained the best paper award at the IEEE BioVis 2016 conference and two honorable mention awards at the IEEE SciVis conference in 2017 and 2018.

Bernhard Preim is professor for visualization at the Computer Science Department at the University of Magdeburg, Germany. In 1994, he received the diploma in Computer Science and in 1998 a Ph.D. in Computer Science from the University of Magdeburg, and a habilitation (venia legendi) in 2002 from the University of Bremen. His research interests are in medical visualization, visual analytics and virtual reality with applications medical in diagnosis and treatment.

Katja Bühler is senior researcher at VRVis Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH focusing on translational research in close cooperation with industry. She is head of the Biomedical Image Informatics Group at VRVis since 2003 and coordinates the research area Visual Computing for Complex Systems since 2010. She received a Diploma in Mathematics from the Karlsruhe Institute of Technology, Germany and a PhD in Computer Science from TU Wien, Austria, where she also worked until 2002 as assistant professor at the Institute of Visual Computing and Human-Centered Technology. She is member of the steering committee “GI Fachgruppe Visual Computing in der Medizin”, and member

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Renata Raidou is assistant professor for visualization at the Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence at the University of Groningen, the Netherlands. Previously, she was a post-doc at the Institute of Visual Computing and Human-Centered Technology, at TU Wien, Austria. She received her Ph.D. in Medical Visualization from Eindhoven University of Technology, the Netherlands, in 2017, for which she was awarded the EuroVis Best Ph.D. Award 2018 and the EG Dirk Bartz Prize for Visual Computing in Medicine 2017. Her research focus is on the interface between Visual Analytics, Image Processing and Machine Learning, with a strong focus on medical applications. She is member of the steering committee "GI Fachgruppe Visual Computing in der Medizin".

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