Foreword to the special section on visual computing for biology and medicine (VCBM 2023)

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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 three articles within the scope of the EG Workshop on Visual Computing for Biology and Medicine, which took place for the 13th time on September 20–22, 2023 in Norrköping, Sweden.

At the workshop, 9 full papers and 5 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 2023, as well as original works and surveys related to the VCBM topics. We received in total fifteen submissions (four extensions and eleven original submissions). 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 additional researchers in the field. Consequently, we accepted the three papers that are now collected in this special section. The section includes the development of a tool for sketching dynamic visual summaries in biology with application to infection phenomena [1], an interactive game based on visual narratives to edutain, i.e., to educate while entertaining, broad audiences against misleading visualizations in healthcare [2], and a study on how different surface models affect the perception of pathological growth and shrinkage using of intracranial aneurysms and liver tumors [3]. 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 efforts of VCBM 2023's full, short, and poster co-chairs, and EuroGraphics for their support of this event. Last but not least, we would like to thank all reviewers for their hard work and their high-quality reviews.

CRediT authorship contribution statement

Renata G. Raidou: Formal analysis, Project administration, Validation, Writing – original draft. **James B. Procter:** Formal analysis, Validation, Writing – review & editing. **Christian Hansen:** Formal analysis, Validation, Writing – review & editing. **Thomas Höllt:** Formal analysis, Project administration, Validation, Writing – review & editing. **Daniel Jönsson:** Formal analysis, Project administration, Validation, Writing – original draft, Writing – review & editing.

Data availability

No data was used for the research described in the article.

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Renata G. Raidou is assistant professor (tenure track) for biomedical visualization and visual analytics at TU Wien, Austria. Previously, she was assistant professor at the University of Groningen, the Netherlands. She did her post-doc at TU Wien, Austria and 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. In 2022, she was also awarded the EuroVis Young Researcher Award for her contributions to the field of biomedical visualization. Her research focus is on the interface between visual analytics, image processing, and machine learning, with a strong focus on medical applications. She is a member of the steering committee "GI Fachgruppe Visual Computing in der Medizin" and a member of the steering committee of EG VCBM.

James B. Procter is the Wellcome Trust funded Coordinator for the Jalview (www.jalview.org) resource for interactive visualization and analysis of biomolecular sequence data, in the Barton Group at the University of Dundee's School of Life Sciences in Scotland, UK. They have over 30 years experience as student, researcher, and developer–practitioner in interactive data visualization, machine learning, high-performance computing and open-source software engineering in biology and medicine, and serve as academic editor for PeerJ and PeerJ CS. In 2009 they co-founded VIZBI - the international conference series on 'Visualizing Biological Data' (vizbi.org), and currently chairs the steering committee for the International Society of Computational Biology (ISCB) Community of Special Interest on Biological (and Medical) Visualization (BIOVIS

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- biovis.net), which together with VCBM convenes the Bio(Med)Vis track at Intelligent Systems for Molecular Biology and the BioMedVis Challenge workshop at IEEE VIS.

Christian Hansen is a Full Professor of Virtual and Augmented Reality at the Faculty of Computer Science at University of Magdeburg, Germany. He earned his Ph.D. from Jacobs University Bremen, Germany, in 2012, then joined the University of Magdeburg as an Assistant Professor for Computer-Assisted Surgery until 2020. From 2017 to 2018, he was a research fellow at Harvard Medical School in Boston, USA. His current research interests are in the areas of human–machine interaction, virtual and augmented reality, and medical image computing.

Thomas Höllt is an Assistant Professor in the Computer Graphics and Visualization group at TU Delft, Delft, The Netherlands. His research interests are in Visualization and Visual Analytics, with a focus on bio-/medical applications. He received his Ph.D. from the King Abdullah University of Science and Technology, Thuwal, Saudi Arabia in 2013. Dr. Höllt published over 50 peer-reviewed publications including the winning entry for the Dirk Bartz Prize for visual computing in medicine in 2019. He is a member of the EUROGRAPHICS association which he also serves as publicity and online chair and a member of the steering committee of EG VCBM.

Daniel Jönsson is an associate professor and head of the Computer Graphics and Image Processing group at the Department of Natural Science and Engineering at Linköping University, Sweden. After receiving his doctoral degree from Linköping University in 2016, he continued as an assistant professor (tenure track). In 2022, he spent a year as a guest researcher at Ulm University, Germany after which he became an associate professor at Linköping University. His research lie in the intersection between visualization and machine learning with a wide variety of application areas such as medical imaging and communication. He has co-organized several workshops, co-chair, and IPC member at major conferences in visualization. More information can be found at https://liu.se/en/employee/danjo37

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