New Frontiers in Computational Medical XR

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Abstract:

The exponential growth of generative AI and spatial computing heralds a new era with profound promise for application in healthcare. Our workshop on **New Frontiers in Computational Medical XR** invites paper submissions from computer scientists, XR developers, and medical professionals at the forefront of technological innovation in healthcare. By exploring the technical underpinnings and applications of computational models in medicine, we aim to explore and discuss novel opportunities for diagnostics, therapeutics, personalised care, and training solutions.

Workshop Description:

As we stand at the intersection of life sciences, neuroscience, mathematics, engineering, and computer science, the potential for AI to revolutionise medical procedures, patient care, and research methodologies is unparalleled. Extended reality and spatial computing technologies provide immersive and personalised learning experiences for healthcare professionals and patients. This technical workshop will delve into the mechanics of generative AI and large language models, showcasing their capacity to synthesise complex medical data, simulate patient outcomes, generate actionable insights for clinical decision-making, and advance computational medical XR. Contributions are sought which will engage participants and participation with cutting-edge research and development in AI-driven medical XR technologies, from neural networks and computational geometry to the latest advancements in XR for surgical planning, training, and rehabilitation, immersive and embodied research approaches for medical training and education, Surgical planning and real-time operative navigation using generative AI in XR, low-code/no-code authoring platforms for medical XR, Assessment and analytics in medical XR, Deep learning systems for diagnostics, therapeutics, and rehabilitation in XR environments, and personalised care and rehabilitation through AI-driven medical XR solutions.

Topics will include but not be limited to:

- XR hardware and sensors
- XR in medical imaging
- AI in medical XR
- Medical XR design, development, and clinical deployment
- XR neuropsychological and biological mechanisms of action
- Clinical applications of XR in neurology, psychology, or neurosensory modulation
- Clinical applications of XR in nonsurgical specialties (e.g., medicine, pediatrics, dentistry, nursing)
- Clinical applications of XR in perioperative and surgical specialties
- Therapeutic applications of XR in allied health services
- XR for patient education and communication
- XR for medical or surgical training and education
- Embodiment and body tracking in medical XR
- Assessment and analytics methods in medical XR
- Ethics, safety, privacy, and adverse effects of medical XR

Socioeconomic and regulatory aspects of MXRBy engaging directly with peer-reviewed papers and presentations from select authors, participants will gain a balanced view of current research, development efforts, and practical applications of AI in healthcare. The workshop will also address the ethical considerations and challenges of integrating AI technologies in medical contexts, fostering a dialogue on responsible innovation.

- Accepted papers may be published in the LNCS book proceedings published by Springer.
- Oral only applications are also considered.

Workshop Logistics:	Monday July 1, 2024 (9h-17h30) – Campus Biotech Geneva
Paper Submissions:	http://www.cgs-network.org/cgi24/for-authors/
Submission Deadline:	May 2, 2024.
Workshop Registration Fees:	150CHF (1-day attendance)
Conference Registration:	http://www.cgs-network.org/cgi24/ (not required for workshop)
Attendance:	Hybrid

Workshop Format:

- 15 minute presentations, 5 minutes for questions.