IGA FOR BIOMEDICAL APPLICATIONS

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MINISYMPOSIUM

Computational modeling for biomedical applications provides a non-invasive modality for understanding the underlying mechanics of several biological systems and guiding device design and treatment planning. In particular, Isogeometric Analysis has the potential to play an essential role in modeling biological systems by eliminating complex mesh generation or tedious geometry handling processes. The future of computational modeling in biomedical applications lies in patient-specific simulations of real disease events, enabling simulation-assisted diagnostics, device design and deployment, and treatment planning decisions. The primary challenge in this regard is that patient-specific phenomena involve the synergistic interplay of multiple underlying physical or chemical processes coupled with each other across several spatial and temporal scales. Computational multiphysics modeling has thus gradually emerged as a new frontier in the advanced modeling of biomedical systems, aiming to resolve physiological and pathological phenomena in real patient-specific scenarios. Advancements in this field require the engagement of engineering principles from various disciplines and call for interdisciplinary research efforts beyond current multiscale computational mechanics approaches. This mini-symposium will bring together scientists working across various domains to provide a platform for discussing the state-of-the-art and future directions in multiphysics and multiscale modeling of biomedical systems. We invite fundamental as well as applied contributions from a wide range of topics focusing on theoretical and computational approaches for modeling biomedical systems.