

J-BHI Special Issue on “Augmented Reality for Bioinformatics”

Augmented Reality is a key technology that will facilitate a major paradigm shift in the way users interact with data and has only just recently been recognized as a viable solution for solving many critical needs. Enter augmented reality (AR) technology, which can be used to visualize data from hundreds of sensors simultaneously, overlaying relevant and actionable information over your environment through a headset. With the rapid development of 5G, which makes AR technology much faster, with much more data flow. With easier and more accessible use, for a variety of different functions (besides video gaming), widespread adoption seems likely.

Bioinformatics-related research produces huge heterogeneous amounts of data. This wealth of information includes data describing metabolic mechanisms and pathways, proteomics, transcriptomics, and metabolomics. Often, the visualization and exploration of related structural - usually molecular - data plays an important role in the Bioinformatics. For decades, AR-related technologies were developed and applied to Bioinformatics problems. Often, these approaches provide "just" visual support of the analysis, e.g. in the case of exploring and interacting with a protein on a 3D monitor and compatible interaction hardware. Moreover, in the past, these approaches were limited to cost-intensive professional visualization facilities. The advent of new affordable, and often mobile technologies, provides high potential for using similar approaches regularly for daily research. Visual Analytics is successfully being used for several years to analyze complex and heterogeneous datasets. Immersive Analytics combines these approaches now with new immersive and interactive technologies. here is a growing interest in the broad use of Augmented Reality (AR) and Virtual Reality (VR) in the fields of bioinformatics and cheminformatics to visualize complex biological and chemical structures. AR and VR technologies allow for stunning and immersive experiences, offering untapped opportunities for both research and education purposes.

In summary, AR/VR is a cool upcoming wave that will be associated with Bioinformatics, where the vast repositories of data will enable an AR/VR lens into the scenarios in ways that provide near-immediate insight at a level of depth unimaginable previously. As a result, this special session aims to bring the latest results over Bioinformatics and Augmented Reality technologies for both academia and industry. It can help technicians to exchange the latest technical progress. Topics of interest include, but are not limited to:

- Novel theory for Bioinformatics
- Novel AR/VR devices for Bioinformatics
- AR-based data analysis for Bioinformatics
- 3D models of biochemical structures for AR/VR
- VR-based visualization for Bioinformatics
- Generating 3D (bio) molecular models
- 3D Protein Molecular Dynamic Visualization
- Interactive Molecular Graphics for Augmented Reality
- AR-based human-computer interaction for Bioinformatics
- Privacy protection in Bioinformatics under AR/VR environments

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Key Dates

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