International Conference on Data-Processing and Networking (ICDPN-2024)

Date: 25th-26th October, 2024

ORGANISED BY : Institute of Technology and Business in České Budějovice, Near Prague, Czech Republic, Europe (Venue).

********** CALL FOR PAPERS **********

SPECIAL SESSION ON
Digital Technologies for Biotechnology and Bioinformatics

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SESSION DESCRIPTION:
The session on "Digital Technologies for Biotechnology and Bioinformatics" aims to explore the transformative impact of cutting-edge digital technologies on these fields, emphasizing the crucial role of innovations such as artificial intelligence (AI), machine learning (ML), big data analytics, and cloud computing in advancing research and applications. AI and ML are revolutionizing bioinformatics by enabling the analysis of vast genomic and proteomic datasets, predicting protein structures and functions, and uncovering complex biological interactions and pathways. Big data analytics are vital for handling and analyzing large-scale biological datasets generated by biotechnology research, with cloud-based platforms providing scalable solutions for storing, managing, and facilitating collaborative research. Computational drug discovery leverages in silico methods and machine learning models to predict drug-target interactions, streamline drug discovery, and enable personalized medicine. Digital twin technology creates virtual replicas of biological systems, allowing researchers to simulate and analyze complex interactions for personalized healthcare and therapy. Next-generation sequencing (NGS) has revolutionized genomics, with advanced algorithms and cloud-based solutions ensuring accurate and efficient data processing, aiding in clinical diagnostics and guiding precision medicine.

Blockchain technology secures biological data, ensuring integrity and traceability, despite challenges in scalability and regulatory compliance. IoT-enabled devices enhance continuous monitoring and analysis of real-time biological data, integrating seamlessly with bioinformatics tools to improve laboratory automation and remote diagnostics. This session will provide a comprehensive overview of how these digital technologies are shaping the future of biotechnology and bioinformatics, highlighting their applications, benefits, and challenges, and offering attendees insights into the latest advancements and practical implementations, fostering collaboration and innovation in the field.

RECOMMENDED TOPICS:

Topics to be discussed in this special session include (but are not limited to) the following:

1. **AI and Machine Learning in Bioinformatics**
   - Applications of AI in genomics and proteomics.
   - Machine learning algorithms for predicting protein structures and functions.
   - Integrating AI with bioinformatics tools for enhanced data analysis.

2. **Big Data Analytics in Biotechnology**
   - Handling and analyzing large-scale biological datasets.
   - Cloud-based platforms for bioinformatics and biotechnology research.
   - Data integration and interoperability in biological databases.

3. **Computational Drug Discovery**
   - In silico drug design and virtual screening.
   - Machine learning in predicting drug-target interactions.
   - Computational approaches for personalized medicine.

4. **Digital Twin Technology in Biotechnology**
   - Creating digital twins for biological systems and processes.
   - Applications of digital twins in personalized healthcare and therapy.
   - Challenges and opportunities in digital twin implementation for biological research.

5. **Next-Generation Sequencing (NGS) Data Analysis**
   - Advanced algorithms for NGS data processing.
   - Cloud-based solutions for managing and analyzing NGS data.
   - Case studies on the use of NGS in clinical diagnostics and research.

6. **Internet of Things (IoT) in Biotechnology**
   - IoT-enabled devices for real-time biological data collection.
   - Integration of IoT with bioinformatics for continuous monitoring and analysis.
   - Use cases of IoT in laboratory automation and remote diagnostics.

7. **Digital Health and Telemedicine in Biotechnology**
   - Leveraging digital technologies for remote healthcare and diagnostics.
   - Bioinformatics tools in telemedicine applications.
   - Impact of digital health technologies on patient care and treatment outcomes.

8. **Cybersecurity in Bioinformatics and Biotechnology**

- Protecting sensitive biological data from cyber threats.
- Implementing robust cybersecurity measures in bioinformatics infrastructure.
- Case studies on cybersecurity breaches and their impact on biotechnology research.

9. **Edge Computing in Bioinformatics**
   - Benefits of edge computing for real-time bioinformatics analysis.
   - Implementing edge computing for mobile and portable biological devices.
   - Case studies on the use of edge computing in bioinformatics workflows.

10. **Biological Data Visualization and Interpretation**
    - Advanced visualization tools for complex biological data.
    - Interactive and immersive data visualization techniques.
    - Enhancing biological research through effective data visualization.

11. **Digital Phenotyping and Biomarker Discovery**
    - Using digital technologies for phenotypic data collection and analysis.
    - Identifying novel biomarkers with digital phenotyping tools.
    - Applications of digital phenotyping in precision medicine.

12. **Integration of Genomics and Metabolomics with Digital Technologies**
    - Digital platforms for multi-omics data integration.
    - Analyzing genomic and metabolomic data with AI and machine learning.
    - Case studies on the combined use of genomics and metabolomics in biological research.

SUBMISSION PROCEDURE:

Researchers and practitioners are invited to submit papers for this special theme session on **Digital Technologies for Biotechnology and Bioinformatics** ***on or before*** **30th July 2024**. All submissions must be original and may not be under review by another publication. INTERESTED AUTHORS SHOULD CONSULT THE CONFERENCE'S GUIDELINES FOR MANUSCRIPT SUBMISSIONS at **https://www.icdpn-conf.com/Downloads**. All submitted papers will be reviewed on a double-blind, peer review basis.

NOTE: While submitting paper in this special session, please specify **Digital Technologies for Biotechnology and Bioinformatics** at the top (above paper title) of the first page of your paper.

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