

2024 MIPS Seminar Program

 27 March 2024

 12:00 to 1:00 pm

 LT3

ARTIFICIAL INTELLIGENCE TO EXPLORE THE MULTI-MODALITY BIOMEDICAL DATA AND ACCELERATE KNOWLEDGE DISCOVERY

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Dr. Song is an Associate Professor and Group Leader in the Cancer and Infection and Immunity Programs at the Biomedicine Discovery Institute (BDI), and Department of Biochemistry and Molecular Biology, Faculty of Medicine, Nursing and Health Sciences, Monash University. He is also a member of the Monash Data Futures Institute and the ARC Centre of Excellence in Advanced Molecular Imaging. He is currently an Associate Editor of several international journals including IEEE Journal of Biomedical and Health Informatics, BMC Bioinformatics, Genomics, Proteomics & Bioinformatics, Frontiers in Bioinformatics, and BMC Genomic Data. He is motivated to design, develop, and deploy cutting-edge data-

driven methodologies and techniques to better understand and address a range of challenging questions in biomedicine.

About this talk: The rapid accumulation of molecular data motivates the development of innovative approaches to computationally characterize sequences, structures, and functions of biological and chemical molecules in an efficient, accessible, and accurate manner. We address this vital need by developing a holistic platform that generates features from sequence and structural data for a diverse collection of molecule types. Our freely available and easy-to-use AI platforms can generate, analyse and visualize more than 180 representations for sequences, structures, and ligands of macromolecules. With the assistance of AI tools, users can encode their molecular data into representations that facilitate the construction of predictive models and analytical studies. In addition, I will further illustrate how such AI tools can be used to accelerate biomedical knowledge discovery by exemplifying several data-driven research projects, including secreted effector protein identification, histopathology image-based biomarker discovery, and adaptive immune receptor (AIR)-antigen binding prediction.