



香港城市大學
City University of Hong Kong

Department of Biomedical Sciences presents a seminar

“Charting the map of genomic mutation rates with deep learning”

Prof Cai Li
Professor, School of Life Sciences
Sun Yat-sen University

Date : 27 February 2024 (Tuesday)

Time : 4:00pm – 5:30pm

Venue : LI1406, Li Dak Sum Yip Yio Chin Academic Building, CityU

Abstract

Germline mutation rates are essential for genetic and evolutionary analyses. However, estimating accurate fine-scale mutation rates across the genome is a great challenge, due to relatively few observed mutations and intricate relationships between predictors and mutation rates. We develop a deep learning framework named MuRaL to predict mutation rates at the nucleotide level using only genomic sequences as input. MuRaL can build models with relatively few training mutations and a moderate number of sequenced individuals and can leverage transfer learning to further reduce data and time demands. It can be applied to many species with population genomic data and the resulting mutation rate maps can benefit many analyses.

About the Speaker

Cai Li is a professor at the School of Life Sciences, Sun Yat-sen University. He obtained a bachelor's degree in mathematics from Huazhong University of Science and Technology in 2009 and a Ph.D. in evolutionary genomics from the University of Copenhagen in 2015. His current research focuses on investigating the distribution, genesis and functional effects of newly arising mutations in the genomes using advanced computational approaches and large-scale multi-omics data. He has published >30 papers on high-impact journals including Science, Nature Machine Intelligence and Nature Communications.

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All are welcome!