Wei Cheng

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EDUCATION

Brown University — Aug 2017 - Present
Ph.D. in Computer Science and Computational Biology
M.S. in Computer Science

Cornell University — Aug 2014 - May 2016
B.S. in Computational Biology

China Agricultural University — Aug 2012 - May 2014

RESEARCH EXPERIENCE

Peking University — Oct 2016 - Jan 2017
Research Assistant, Jian Lu Lab

Cornell University — May 2015 - Sep 2016
Research Assistant, Andrew Clark Lab

PUBLICATIONS (*** CO-FIRST AUTHORS**)

[1] **W. Cheng**, G. Darnell, S. Ramachandran, and L. Crawford (2020). Generalizing Variational Autoencoders with Hierarchical Empirical Bayes. *arXiv*:2007.10389

[2] P. Demetci*, **W. Cheng***, G. Darnell, X. Zhou, S. Ramachandran, and L. Crawford (2020). Multi-scale genomic inference using biologically annotated neural networks. *bioRxiv*.184465.

[3] **W. Cheng**, S. Ramachandran, and L. Crawford (2020). Estimation of non-null SNP effect size distributions enables the detection of enriched genes underlying complex traits. *PLOS Genetics*.16(6): e1008855.

SOFTWARE

[1] **BANNs**: Biologically Annotated Neural Networks

[2] **HEBAE**: Hierarchical Empirical Bayes Auto-Encoder

[3] **gene-ε**: A Recalibrated Hypothesis Test for Sets of SNP-Level Summary Statistics

PROJECTS

[1] **VSPG**: Variable Selection using Penalized Gradient method for deep neural network. Develop scalable variable selection importance measurement method under modern automatic differentiation frameworks such as TensorFlow for interpretations of black-box models.

[2] **PINNs**: Build Physics Informed Neural Network (PINNs) for solving Partial Differential Equations (PDEs) in Mechanics such as Navier-Stokes Equations, Lame-Navier Equations, etc.

[3] **PVE**: Inferring Proportion of Variance Explained (PVE) of data. Estimating PVE to understand the upper bound of prediction performance for modern machine learning models.

[4] **VAE-TCGA**: Applying Varational Autoencoders (VAEs) in a supervised manner for efficient learning multi-datasets representations to improve survival prediction performance using TCGA cancer datasets.

SKILLS

R, Python, TensorFlow, PyTorch, Matlab, Linux, JAVA.

COURSES

Advanced Probabilistic Methods, Deep Learning, Deep Learning in Genomics, Machine Learning, Computer Vision, Algorithm for Computational Biology, Statistical Inference in Genomics, Programming and Data Structure.

TEACHING

Teaching assistant − Statistical Analysis of Biological Data