Xupeng Chen

LIFE SCIENCE · TSINGHUA UNIVERSITY

✉ xp-chen14@mails.tsinghua.edu.cn | ⌂ www.cmwonderland.com | james20141606

Education

School of Life Science, Tsinghua University   *Beijing, China*

B.S. IN LIFE SCIENCE   *Sept. 2014 - June. 2019*

- **Minor in Statistics**
- **XueTang program** 2015-2019
- **XinYa College**
- **Related Courses:** •Calculus • Linear Algebra • Probability and Statistics • Mathematical Modelling • System and Computational Neuroscience • Biostatistics • Bioinformatics • Pattern Recognition • Artificial Neural Networks • Neuroscience and AI • Machine Learning and Brain Inspired Intelligence

Honors & Awards

2015-2018	**Scholarship,** XueTang scholarship	*University*
2017	**Second prize,** The First National College Students' Brain Computation and Application Competition	*International*
2017	**First Prize,** eMaize Challenge: Machine learning in breeding	*National*
2018	**Meritorious Winner,** Mathematical Contest in Modeling (MCM) **[Paper Link]**	*International*
2015	**Golden Prize,** Social practice award	*University*
2015	**Grand Prize & best captain,** Return to Alma mater activity	*University*
2016-2018	**Xuetang Research Funding,** $10,000 for Research in Lu lab	*University*
2016-2018	**Research Promotion Program Funding,** $8,000 for Research in Biomedical Image analysis	*University*

Skills

Computer Science
- Programming skills: Python, MATLAB, C++, R.
- Familiar with Machine Learning, Deep Learning (Tensorflow, Keras, Pytorch) and Computer Vision.
- Familiar with Linux, MacOS, Windows

Language
- TOEFL (110), GRE(321)

Research Experience

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eMaize: Develop a machine learning method to predict quantitative traits of maize [Paper Link]   *Lu Lab, Tsinghua University*

SUPERVISOR: **ZHI LU**   *2017-2018*

- Develop a new linear mixed model to predict traits of 36,000 hybrids samples using SNP data to find heterosis.
- Develop a non-parameter model to solve small sample training problems.

Deepshape: Develop a deep learning method to predict the structure of RNA and find MOTIF

Lu Lab, Tsinghua University

Supervisor: **Zhi Lu**

2017-2018

- Process icSHAPE data to train machine learning and deep learning model.
- Transform structure data to image form and develop a modified U-net model to predict.
- Use unsupervised model (VAE) and attention model to classify motif and find its position.
- Use adaptive graph convolution neural networks to learn meaningful stuctural motif.

exRNA: Detection of early-stage liver cancer using extracellular RNA as biomarker

Lu Lab, Tsinghua University

Supervisor: **Zhi Lu**

2017-2018

- Develop a fast method for testing different mapping order of various kinds of RNAs.
- Use statistical methods for sample QC, feature imputation, normalization and batch effect removal.
- Develop robust feature selection and machine learning methods to classify stages of liver cancer and identify novel RNA biomarker.

Reconstruction of neural muscular junction connectomic EM data [Report Link]

Lichtman Lab, Harvard University

Supervisor: **Jeff Lichtman**

2018 Summer

- Use 3D U-net for membrane prediction and z-watershed for axon segmentation.
- Automatic segmenting and tracing.
- 3D reconstruction of axons and NMJs and statistical analysis.

Synapse prediction and synaptic partner identification [Report Link]

Visual Computing Group, Harvard University

Supervisor: **Hanspeter Pfister**

2018 Summer

- 3D U-net for synapse detection in CREMI and JWR data.
- 3D U-net and 3D-CNN for pre and post synaptic partner identification.
- Synapse structure and type analysis.

Mixture density network for Localization Using NLOS TOAs or TDOAs

NYU wireless, New York University

Collaborator: **Jun Li**

2017-2018

- Mixture density network for jointly predicting x, y and z coordinates.
- Mixture density network for uncertainty estimation to identify confusing points.

Cardiacai: a deep learning model for cardiac disease detection [Report Link]

Tsinghua University

Supervisor: **Hongliang Yu**

2017

- Use Deep learning models to analyze X-ray chest image.
- Design new models to classify disease & design a website.
- Win the second prize in the contest.

Medical data Analysis: Student research training project [Report Link]

Tsinghua University

Supervisor: **Xuegong Zhang**

2016-2017

- Use Deep learning models to analyze medical images.
- Collect X-ray and CT images to detect lung diseases. Use 3D and 2D deep learning model.