Xupeng **Chen**

Electrical Engineering · New York University

xc1490@nyu.edu | www.cmwonderland.com | james20141606

Education

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

BSc in Life Science — *Sept. 2014 - June. 2019*

- Minor in Statistics
- XueTang program, cultivating top students to become leading researchers in science
- Courses Taken: Calculus, Linear Algebra, Probability and Statistics, Mathematical Modelling, Biostatistics, Bioinformatics, Pattern Recognition, Artificial Neural Networks.

Tandon School of Engineering, New York University — *Brooklyn, New York*

Ph.D. Student in Electrical Engineering — *Sept. 2019 -*

- Video Lab, Supervisor: Prof. Yao Wang
- Courses Taken: Probability and Stochastics, Digital Signal Processing, Image and Video Processing, Advanced Machine Learning, System Optimization, Medical Imaging

Publications

2018	**Stimulus Speech Decoding from Human Cortex with Generative Adversial Network Transfer Learning**, IEEE International Symposium on Biomedical Imaging	*Accepted*
2018	**Active Detect-and-Cluster: Efficient Instance Annotation for Connectomics**, IEEE Computer Society Conference on Computer Vision and Pattern Recognition	*Under Review*
2018	**exSEEK: Robust exRNA Analysis Tool for Noninvasive Biomarker**,	*Under Review*
2018	**DeepShape: Detection of Sequence and Structural Motif using Deep Learning**, Biology Forum in Tsinghua	*Poster*

Research Experience

Stimulus Speech Decoding from Human Cortex using ECoG signal — *Video Lab, New York University*

Supervisor: **Yao Wang** — *2019-*

- Use wavenet vocoder for spectrogram to speech conversion
- Siamese auto-encoder for large corpus spectrogram encoding and decoding
- GAN based network pretraining for transfer learning

DeepShape: Detection of Sequence and Structural Motif using Deep Learning — *Lu Lab, Tsinghua University*

Supervisor: **Zhi Lu** — *2017-2018*

- Processed structure probing data for 1D and 2D deep learning model in structure prediction
- Used unsupervised deep learning model (VAE) and attention model for Motif detection and localization
- Used graph convolution neural networks to learn meaningful structural motifs

exSeek: Robust exRNA Analysis Tool for Noninvasive Biomarker

Lu Lab, Tsinghua University

Supervisor: **Zhi Lu** *2017-2018*

- Developed a complete pipeline for exRNA analysis. Included mapping, counts, matrix processing, robust feature selection and evaluation
- Used statistical and machine learning model for imputation, normalization, batch removal and feature selection
- Packaged all functions into software. Validated on published and lab dataset

eMaize: Machine learning method for quantitative traits prediction

Lu Lab, Tsinghua University

Supervisor: **Zhi Lu** *2017-2018*

- Developed a new linear mixed model to predict traits of 36,000 hybrid samples using SNP data to find heterosis in maize
- Developed a non-parameter model to solve small sample training problems

Mixture density network for Localization Using NLOS TOAs or TDOAs

NYU wireless, New York University

Collaborator: **Jun Li** *2017-2018*

- Constructed a mixture density network for x, y and z coordinates joint prediction. Estimate uncertainty for confusing points identification
- Constructed an attention based model for feature weight adjustment

Efficient Instance Annotation for Connectomics

Visual Computing Group, Harvard University

Supervisor: **Hanspeter Pfister** *2018 Summer*

- Constructed a powerful 3D U-net for synapse detection in CREMI dataset. Ranked 1^{st} place in CREMI contest
- Constructed 3D U-net and 3D-CNN for synaptic connections between neurons, and intracellular structures like mitochondria. Construct an active-learning annotation framework for proofreading
- Applied models to predict JWR dataset with 1 million synapses. Submitted a paper to conference on Computer Vision and Pattern Recognition (CVPR)

Reconstruction of neural muscular junction connectomic EM data

Lichtman Lab, Harvard University

Supervisor: **Jeff Lichtman** *2018 Summer*

- Used 3D U-net and matching algorithm for neuron membrane prediction and tracing
- 3D reconstruction of 13 neural muscular juntions between neurons and muscles (largest ever)
- Quantified the linear correlation of axonal diameter and synaptic area by statistical analysis

Cardiacai: a deep learning model for cardiac disease detection

Tsinghua University

Supervisor: **Hongliang Yu** *2017*

- Use deep learning models to analyze 3,000 X-ray chest images for heart disease classification
- Utilized a U-net for heart region attention and a VGG-net for classification
- Won the second prize in the First National College Students' Brain Computation and Application Competition

Medical data Analysis: Student research training project

Tsinghua University

Supervisor: **Xuegong Zhang** *2016-2017*

- Used 3D CNN and 3D U-net to analyze medical images
- Collected X-ray and CT images to detect lung diseases. Used 3D and 2D U-net for nodules detection

Activities&Awards

2018	**Teaching Assistant in Bioinformatics Basic Course,** Wrote three chapters of teaching gitbook	*University*
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)	*International*
2016-2018	**Xuetang Research Funding,** $10,000 for Research in Lu lab	*University*
2016-2018	**Initiative Scientific Research Program,** $8,000 for Research in Biomedical Image analysis	*University*
2015	**Golden Prize,** Social practice award for investigation on e-cycling	*University*

Skills

- Proficient in Python, MATLAB, R, Bash, LaTeX
- Familiar with Machine Learning, Deep Learning (Tensorflow, Keras, Pytorch) and Computer Vision tools.
- Familiar with Linux, MacOS, Windows