**Haotian Teng**

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**RESEARCH EXPERIENCE**

**Detecting m6A modification in RNA using long read sequencing**  Jan 2021 – Present

**Advisor: Prof. Ziv Bar-Joseph & Prof. Carl Kingsford, Computational Biology Department, School of Computer Science, Carnegie Mellon University**

* Developed a hybrid model that combine non-homogeneous Hidden Markov Model (NHMM) and Convolutional-Recurrent Neural Network (CRNN) to do unsurpervised training on ONT sequencing signal to detect m6A modification in RNA.

**Clustering and visualize the single-cell spatial transcriptomics data.** Aug2019 - Feb 2022

**Advisor: Prof. Ziv Bar-Joseph**

* Developed a Gaussian-Multinomial mixture probabilistic graphical model to clustering the cell from single-molecule Fluorescence in situ hybridization (FISH) data (Project page: <https://github.com/haotianteng/FICT>).
* Developed a denoise auto-encoder for profiling gene expression. (Project page: <https://github.com/haotianteng/GECT>).
* Produce a simulation pipeline based on Metropolis-Hasting to validate the spatial transcriptomics clustering tools and benchmark&visualize the clustering result. (Project page: <https://github.com/haotianteng/FICT-SAMPLE>)

**Using Machine learning algorithm in Nanopore long-read sequencing Basecalling** Feb 2017 - Jul 2018

**Advisor: Prof. Lachlan Coin, Institute for Molecular Bioscience, University of Queensland**

* Built a deep learning basecaller **Chiron** using Tensorflow, for Oxford Nanopore sequencer basecalling

(Project page: <https://github.com/haotianteng/Chiron>)

* Developed a segmentation tool **BoostNano** to identify the polyA region in the Nanopore RNA sequencing platform. (Project page: <https://github.com/haotianteng/BoostNano>)
* Prepared training dataset of DNA and RNA Nanopore basecalling reads, perform data labeling and data washing.
* Implemented a pipeline in Google Cloud and Google Compute Engine for end-to-end genome analysis.

**PROFESSIONAL EXPERIENCE**

**Bioinformatics Engineer @ Novogene Europe** Sep2018 - Feb 2019

* Optimized the human resequencing and laboratory automation pipeline cooperatively in a medium size group.
* Designed and developed the long-read sequencing platform.

**PUBLICATIONS**

* **Teng, H.**, Yuan, Y., & Bar-Joseph, Z. (2021). Clustering Spatial Transcriptomics Data. *Bioinformatics*, *38*(4), 997-1004.
* Pitt, M. E., Nguyen, S. H., Duarte, T. P., **Teng, H.**, Blaskovich, M. A., Cooper, M. A., & Coin, L. J. (2020). Evaluating the genome and resistome of extensively drug-resistant Klebsiella pneumoniae using native DNA and RNA Nanopore sequencing.*GigaScience, 9(2), giaa002.*
* **Teng, H.**, Cao, M. D., Hall, M. B., Duarte, T., Wang, S., & Coin, L. J. (2018). Chiron: translating nanopore raw signal directly into nucleotide sequence using deep learning. *GigaScience, 7(5), giy037.*
* Avitan, L., Pujic, Z., Mölter, J., Van De Poll, M., Sun, B., **Teng, H.**, Amor, R., Scott, E.K. and Goodhill, G.J., 2017. Spontaneous activity in the zebrafish tectum reorganizes over development and is influenced by visual experience. *Current Biology, 27(16), pp.2407-2419.*
* **Teng, H.** “A neuron-muscle circuit model of C.elegans’s locomotion.” *Bachelor of Science Thesis: Peking University, 2015*

**EDUCATION**

**Carnegie Mellon University**,Pittsburgh, United States

Ph.D., Computational Biology

* Advisor: Ziv Bar-Joseph, Machine Learning Department and Computational Biology department,

School of Computer Science, Carnegie Mellon University. 2020 - present

Core Courses: Computational Genomics 02-710, Machine Learning 10-701, Deep Reinforcement Learning 10-703, Probabilistic Graphical Models 10-708, Convex Optimization 10-725, Advanced NLP 11-711

**University of Queensland**, Queensland, Australia

M.S., Bioinformatics 2016 - 2019

**Peking University**, Beijing, China

B.S., Physics 2011 - 2015

**SKILLS**

* Programming: Python, C++, Bash, MATLAB, R
* Packages&Platforms: Tensorflow, PyTorch, OpenGL, BWA, SAMtools, Velvet.