

# Yukun Huang 黄宇坤

Department of Computer Science

+852-9884 9321

[jimmyhuang.hku@gmail.com](mailto:jimmyhuang.hku@gmail.com)

Flat J, 13/F, Block B Chong Yip Centre, No.11-21 Whitty Street, Shek Tong Tsui, Hong Kong

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## Education

09/2012 – 06/2016

The University of Hong Kong,

- Bachelor of Engineering (Major in **Computer Science**)
- CGPA 3.59/4.00 (converted to 4.0 system by WES)

## Awards and Honour

- **HKU Computer Science Final Year Project Competition 2015-16 Champion**
- **HKU Computer Science Final Year Project 2015-16 Best Presentation**

## Research Experience

06/2015 – 02/2016

**MegaGTA: a sensitive and accurate metagenomics Gene-Targeted Assembler using iterative de Bruijn graphs**

Department of Computer Science, The University of Hong Kong

Advisor: Prof. T. W. Lam

- Co-developed the state-of-the-art gene-targeted metagenomics assembly software **MegaGTA** (<https://github.com/HKU-BAL/megagta>), which is at least 7-fold faster than the existing algorithm and being equally space-efficient
- Redesigned the **de Bruijn graph data structure** to eliminate **false positive assembly**
- Designed **parallel computing structures** to speed up computationally intensive components
- Familiar with representing patterns through **Hidden Markov Models** (HMMs)
- Paper accepted by **ISBRA 2016** (<http://alan.cs.gsu.edu/isbra16/?q=node/15z0>), submitted for review to *Bioinformatics* (<http://bioinformatics.oxfordjournals.org/>)

02/2016 – 07/2016

**Identify Antibiotic Resistance Genes of Pathogens from Patient's extracted DNA data**

Department of Computer Science, The University of Hong Kong

Advisor: Prof. T. W. Lam

- Collaborated with **Hong Kong Sanatorium & Hospital** (HKSH) for helping doctors **detect pathogens** precisely
- Built **HMMs for antibiotics resistance genes** in existing gene databases e.g. NCBI, Pfam
- Utilised representative models of suspicious genes to guide **MegaGTA** on searching through **sequencing data from patients** to **identify** the existence of these genes

07/2016 – 11/2016

**Long Noisy Single Molecule Real Time (SMRT) sequences de novo assembly**

Department of Computer Science, The University of Hong Kong

Advisor: Prof. T. W. Lam

- Utilised the **coverage of read-to-read local alignments** to differentiate resolvable repeats against unresolvable ones
- Designed an **iterative** assembly process that combines the result of fast alignment tools i.e. **minimap** with more accurate aligners e.g. **daligner**, **Blasr** to achieve satisfying assembly quality in reasonable time
- **Resolved some repeat regions** existing software failed to and thus increased the **NG50**

### Publication

Li, Dinghua, Yukun Huang, Henry Chi-Ming Leung, Ruibang Luo, Hing-Fung Ting, and Tak-Wah Lam. "MegaGTA: A Sensitive and Accurate Metagenomic Gene-Targeted Assembler Using Iterative de Bruijn Graphs." In *Bioinformatics Research and Applications: 12th International Symposium, ISBRA 2016, Minsk, Belarus, June 5-8, 2016, Proceedings*, vol. 9683, p. 309. Springer, 2016.

### Working Experience

07/2014 – 06/2015

#### **Intern Developer and Data Scientist, DemystData**

- Worked on **back-end** framework **Ruby on Rails**, focused on developing **business logics** with **MVC** architecture and object-oriented **design patterns**
- Managed **unstructured big data** on databases such as **MySQL**, **Cassandra**, and **MongoDB**. Familiar with principles of both **relational databases** and **NoSQL databases**
- Utilised **predictive models** in **R** such as random forest and SVM to make sense of the data

11/2016 – present

#### **Software Engineer, L3 Bioinformatics**

- Worked on the Hong Kong Government ITF funded project: **Genomic DataBase for the Chinese Population with Applications to Precision Medicine**
- Worked on **front-end** framework **Ember.js**, focused on **understanding user** i.e. doctors, biologists **needs** and **designing user interfaces**
- Aimed to learn the way of **commercialising cutting-edge research** and to practise front-end skills for the ability of **full-stack software development**

### Extra-curriculum Activities

02/2014 – 02/2015

#### **Chairperson, Computer Society, HKUSU**

- Developed excellent **leadership** skills through organising various events and holding efficient meetings
- Hold the first time **HKU League of Legends (LoL) competition**. By calling, emailing and giving presentations to the potential business partners, gained **sponsorship** of \$15,000 for the event
- Offered organised **computer courses** to 353 annual members, the teaching was on **Programming, Photoshop, PowerPoint and etc.**
- Organised visiting to tech companies e.g. **Microsoft** and **Bloomberg** in Hong Kong, provided chances for members to interact with the industry

09/2013 – 03/2014

#### **Dating with Sylvia Chang (张艾嘉), General Education of HKU**

- Student moderator and assistant of famous **director Edward Lam**
- Delivered in depth communication with the guest in front of over 200 audiences per talk, which we had 6 in total for whole public
- Invited to give a performance as a **guest singer** in the 3rd talk
- Gained the experience to collaborate with celebrities under cameras, established strong **communication skills**
- It was recorded on [https://www.youtube.com/watch?v=ag0\\_R1DaB0I](https://www.youtube.com/watch?v=ag0_R1DaB0I)

### Professional skills

Familiar with **Linux** and **Operating System** principle,  
Familiar with team-working on **Git, Slack and Jira**,  
Familiar with back-end framework **Ruby on Rails**, front-end framework **Ember.js**,  
Solid programming background with **C++**, **Java**, **Ruby** and **JavaScript**,  
Familiar with DBMS, experience on **MySQL**, **Cassandra**, and **MongoDB**,  
Experience with **Hadoop** and solution to system **scalability**

### Language Skills

Good command of Chinese (native of both Cantonese and Mandarin), good command of written & spoken English

### Interests and Hobbies

I enjoy western classical music pieces of **J.S.Bach**, **Vivaldi** and **Chinese Guqin** pieces.

I play the role of **singer** in small&casual bands.

I was a medal-winning **basketball player** (Point Guard) and 400m **runner** in high school.

I play **tennis** and a little bit of **golf** now.

I read **books** all the time, from *Pride and Prejudice* to *Beautiful Code* to *Zero to One*,

I am filled with **curiosity**.