Curriculum Vitae

Buhan Feng(馮步翰)

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Education background

Sept. 2020 to Present — **MPhil** in Bioinformatics, School of Life Science, Sun Yat-Sen University, Guangzhou, China

- GPA 3.12
- Command skills: **Python, R, Statistic, Other practical skills at Bioinformatic**
- Basic biological courses: **Molecular Biology, Cell Biology, Biochemistry**

Sept. 2012 to Jun. 2016 — **B.E.** in Electronic Information Engineering, School of Engineering, South China Agricultural University, Guangzhou, China

- GPA 3.27
- The Second Prize Scholarship (1/5)
- NATIONAL SCIENCE & TECHNOLOGY SPORTS COMPETITION - RADIO TEAM COMPETITION, **FIRST PRIZE**
- **CHN Patent 《低成本的農業航空機載多光譜相機成像與採集系統》**
- Command skills: **Embedding System designing, one-chip computer, C/C++**

Working experience

Sept. 2017 to Jul. 2020 — **Software Engineer** in Teligen CO., LTD (匯智通信技術有限公司,中央企業), Guangzhou, China

- Adept at developing **web application** (Both front and back end)
- Command skills: **Java, JavaScript, Database, SQL, Spring Boot, Vue**
- Leading role of development crew

Jun. 2016 to Aug. 2017 — **Associated Software Engineer** in HSBC Development Center (匯豐銀行環球開發中心), Guangzhou, China

- Support banking business of HSBC around the world
- Design workflow of server using **Shell Script**

Academic practice

1. A Comprehensive Development Cells Atlas for Zebrafish

Cellular heterogeneity has long been a core challenge for biology. Recently, single-cell RNA sequencing (sc-RNA-seq) have been utilized to characterize cellular heterogeneity of zebrafish embryo. Although many development stages of embryo have been study, a complete developmental profile for zebrafish that cross all stages is still lacking. Here, we collect sc-RNA-seq data from different experience, which includes 990,000 cells covering 24 developmental stages. We first evaluate the integrative ability of the data through quantifying and correcting the batch effects. Then, we apply unsupervised cluster to identify 30 distinct cell types and 60

subtypes. We curating a known marker genes list from exist publish and use these genes to annotate cell types and subtypes confidentially. For investigating development trajectory, we develop a tool which can integrate spatial RNA sequencing data with sc-RNA-seq data to construct a development trajectory. 50 branches are identified, we focus on analyzing the hematopoiesis branch. We also compare cell type frequencies of zebrafish with human and mouse during development. Taken together, our research offers unprecedently comprehensive view on development of zebrafish. Besides, we develop a toolkit to analyze cross experience data, which fulfill the potential of scRNA-seq data.

This work is in progress, I am looking for cooperation/guidance. For getting more details, please refer to https://buhanfeng.github.io/.

2. Malnutrition and Short Life Span in Zebrafish Genetically Devoid of Chitin-based Peritrophic Membrane

Chitin-based peritrophic membrane (PM), a structure involved in the gut barrier immunity and digestion in insects, was recently found to exist in fishes. Here we generated zebrafish mutants genetically devoid of PM. We found that PM creates at least two different niches for gut microbiota, but they are both destroyed by PM loss. I compared the gut microbiota between the wildtypes and the mutants to investigate if the balance of the bacterial population is disturbed by the PM loss. Six wildtypes and six mutants 16S rRNA libraries were prepared from the isolated zebrafish gut.

In this research, I finish analyzing microbiome data. Firstly, I built up a highly automatic pipeline with best performance. Secondly, because microbiome data has high variance, I did many trials and found a solid trend from a tranche of results. This step is benefited from the highly automatic pipeline built up from first step. Achievement of this research is under review.

3. Training Received from School of Engineering, South China Agricultural University

From 2012 to 2016, I took undergraduate course from South China Agricultural University, majored in Embedding System (one of the subclass in Electronic and Information Engineering). I had lots of Embedding System designing practice during this period. Including Smart Home System (Undergraduate thesis), Airborne Multispectral Camera in Agriculture (CHN Patent), NATIONAL SCIENCE & TECHNOLOGY SPORTS COMPETITION - RADIO TEAM COMPETITION (FIRST PRIZE) etc.

To design an Embedding System, we usually starting with an one-ship computer, which is typically the foundational device for Embedding System. Then we load a scalable system to the chip, we usually choose Linux system for this highly scalable character. Then we develop application for this system. In most circumstance, we use C/C++ programming language to finish developing job because it is an interpreter-free language. Most Embedding Systems are sensitive to power dissipation and volume of the application.

Working practice

1. Developing Web Application for Security Department in Teligen CO., LTD

Teligen is an information technology company. Its principal business is developing various applications for security department of the government. During this period, I took part in several website developing projects (features of the application was not described due to confidentiality agreement).

I was leading role of the development crew in two projects. We develop front end use JavaScript programming language. At the meantime, we make good use of some popular framework of front end, including Vue, Angular etc. Besides, I also have good command of back end developing skills. We use Java programming

language to develop back end. Also, we use Spring Boot or other framework to standardize our development. The core problem for back end is its big data volume and real time requirement. To handle these problems, we design a high availability data transfer scheme. Overall, I am capable to develop web application (both front and back end) independently.

2. Supporting Banking Business of HSBC Around the World

HSBC Development Center is an IT service department of HSBC. we deliver IT support to business department of HSBC around the world.

My counterpart clients come from Malaysia. I am responsible for collecting demand from them and developing practical tools for them. For example, barcode extractor, extracting barcodes from high throughput trading letters.