Kyung Hoi (Joseph) **Min**

COMPUTATIONAL BIOLOGIST · SOFTWARE ENGINEER

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Education

MIT   *Cambridge, MA*

PHD. STUDENT IN EECS   *Aug 2020 - Present*

Caltech   *Pasadena, CA*

B.S. IN BIOLOGY AND COMPUTER SCIENCE   *Sept 2016 - Jun 2020*

- Cum. GPA: 4.0 / 4.3
- Biology Courses: Regulation of Gene Expression, Cell Biology, Genetics, Bioinformatics
- CS Courses: Decidability and Tractability, Algorithms, Learning Systems

Experience

Ginkgo Bioworks   *Boston, MA*

SOFTWARE SOLUTION ENGINEERING INTERN   *Jun 2020 - Aug 2020*

- Worked on migrating Ginkgo's mass spectrometry data pipeline to AWS and Airflow.
- Was responsible for the full development cycle of the project–from conceptualization, making architectural and design decisions to implementation, validation, and release.

Pachter Lab   *Pasadena, CA*

UNDERGRADUATE RESEARCHER   *Sept 2019 - Jun 2020*

- Worked with **Sina Booeshaghi** and **Prof Lior Pachter** on single-cell RNA-seq projects.
- Developed a friendly wrapper around a popular scRNA-seq pre-processing pipeline (kb-python).

Ginkgo Bioworks   *Boston, MA*

SOFTWARE ENGINEERING INTERN   *Jun. 2019 - Sept 2019*

- Worked on improving Ginkgo's in-house data analysis pipeline and various backend services.
- Worked with other software engineers in an Agile environment to deliver stable, scalable and tested products.

Sternberg Lab   *Pasadena, CA*

UNDERGRADUATE RESEARCHER   *Jan 2017 - Jun 2019*

- Worked with **David Angeles PhD.** and **Prof Paul W. Sternberg** on projects involving the model organism C. elegans.
- Developed an automatic, complete RNA-seq pipeline for nematodes (Alaska).

Projects

lfq   ○ *Lioscro/lfq*

HOBBY PROJECT   *Aug 2020 - Present*

- New binary encoding for FASTQ sequence data.
- Developed a cross-platform command-line tool to encode and decode FASTQ files to and from this new data format.

Mass Spectrometry Pipeline

GINKGO BIOWORKS   *Jun 2020 - Aug 2020*

- Migrated mass spectrometry pipeline, which depended on an on-prem Windows machine, to Linux on AWS and Airflow.
- Implemented the ability to call Windows DLLs within Linux with Wine and IronPython.
- Retired an internal fork of ProteoWizard by contributing back to the project.

kb-python   ○ *pachterlab/kb_python*

PACHTER LAB   *Oct 2019 - Present*

- A Python wrapper around the kallisto | bustools pipeline for scRNA-seq pre-processing.
- Pre-processes scRNA-seq data into gene count matrices and RNA velocity matrices.
- Provides pre-built reference indices for pseudoalignment.

NGS Pipeline
GINKGO BIOWORKS *Jun 2019 - Sept 2019*
- Migrated in-house NGS pipeline to the cloud (AWS S3, Batch, DynamoDB).
- Implemented pipeline metrics collection with Elasticsearch and Grafana.
- Implemented contamination screening via taxonomy analysis with Centrifuge.

Alaska
STERNBERG LAB *Jan 2017 - Aug 2019*
- Developed a framework for automated, complete RNA-seq analysis.
- Parse Server backend. Frontend portal in Javascript, HTML/CSS. Containerization with Docker.
- Presented a poster at the 21st International *C. elegans* Conference.

Publications

2020	**Feature demultiplexing for single-cell genomics assays**, co-first author	*In preparation*
2020	**Modular and efficient pre-processing of single-cell RNA-seq**, author	*Under review*

Presentations

SURF Seminar Day
Pasadena, CA
PRESENTER FOR <A FRAMEWORK FOR AUTOMATED, COMPLETE RNA-SEQ ANALYSIS> *Oct 2018*
- Presented work done on Alaska during summer fellowship.

21st International *C. elegans* Conference
Los Angeles, CA
POSTER PRESENTER FOR <A FRAMEWORK FOR AUTOMATED, COMPLETE RNA-SEQ ANALYSIS> *Jun 2017*
- Introduced Alaska, an RNA-seq analysis pipeline for nematodes.

Awards & Honors

2018	**Semi-finalist**, Perpall Speaking Competition	*Pasadena, CA*
2018	**Fellow**, Samuel P. and Frances Krown SURF Fellowship	*Pasadena, CA*
2017	**Fellow**, SURF Fellowship	*Pasadena, CA*

Skills

Programming	Python, Javascript, C/C++, HTML/CSS
Software	Docker, Django, Apache Airflow, AWS S3/Batch/DynamoDB, Elasticsearch, React.js, CI/CD, Numpy, Pandas
Data Analysis	Bulk RNA-seq, Single-cell RNA-seq
Molecular Biology	PCR, Cloning, Purification

Extracurriculars

The Big T Yearbook
Pasadena, CA
BUSINESS MANAGER, DESIGNER, PHOTOGRAPHER; EDITOR-IN-CHIEF SEPT 2019 - JUN 2020 *Sept 2016 - Jun 2020*
- (Editor-in-Chief) Responsible for setting the theme, layout, content, and publishing of the 2019-2020 yearbook.
- Established a new advertisement system, shared cloud storage system, job organization and assignment system, and payment reimbursement system.
- Designed pages and took/edited photos with Adobe Creative Cloud software.

Caltech & American Red Cross
Pasadena, CA
HEALTH ADVOCATE & EMERGENCY MEDICAL RESPONDER *Sept 2017 - Jun 2020*
- American Red Cross certified emergency medical responder and basic life support provider.
- Worked as the dormitory health advocate and provided first aid to students.

Student Government, Lloyd House
Pasadena, CA
HISTORIAN *Jun 2017 - May 2019*
- Responsible for recording Lloyd House (dormitory) events by taking photos.
- Established a new shared cloud storage system to distribute these photos.