

# Kyung Hoi (Joseph) Min

COMPUTATIONAL BIOLOGIST · SOFTWARE ENGINEER

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## Education

### MIT

PHD. STUDENT IN EECS

- Working as a research assistant in the Weissman Lab at the Whitehead Institute

Cambridge, MA

Aug 2020 - Present

### Caltech

B.S. IN BIOLOGY AND COMPUTER SCIENCE

- Biology Courses: Regulation of Gene Expression, Cell Biology, Genetics, Bioinformatics
- CS Courses: Decidability and Tractability, Algorithms, Learning Systems

Pasadena, CA

Sept 2016 - Jun 2020

## Experience

### Research Assistant

WEISSMAN LAB

- Studying cancer evolution via synthetic lineage reconstruction using a CRISPR-enabled lineage tracer in a lung cancer mouse model.
- Developing a tool to preprocess single cell metabolic labeling data to quantify RNA splicing kinetics.

Cambridge, MA

Dec 2020 - Present

### Software Solution Engineering Intern

GINKGO BIOWORKS

- 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.

Boston, MA

Jun 2020 - Aug 2020

### Undergraduate Researcher

PACHTER LAB

- Worked with **Sina Boeshaghi** and **Prof Lior Pachter** on single-cell RNA-seq projects.
- Developed a friendly wrapper around a popular scRNA-seq pre-processing pipeline (kb-python).
- Developed a user interface for the open-source fraction collector (Colosseum) using PyQt5 and later as a web application with React.js.

Pasadena, CA

Sept 2019 - Jun 2020

### Software Engineering Intern

GINKGO BIOWORKS

- Improved 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.

Boston, MA

Jun. 2019 - Sept 2019

### Undergraduate Researcher

STERNBERG LAB

- 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).

Pasadena, CA

Jan 2017 - Jun 2019

## Projects

### dynast

WEISSMAN LAB

- Pipeline for complete splicing and labeling quantification from metabolic labeling scRNA-seq experiments.
- Ability to perform estimation of labeled/unlabeled RNA using a Bayesian inference model.

 [aristoteleo/dynast-release](#)

Oct 2020 - Present

### Mass Spectrometry Pipeline

GINKGO BIOWORKS

- 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.

Jun 2020 - Aug 2020

## Colosseum

PACHTER LAB

- A low-cost, modular, open-source automated fluid sampling device for scalable microfluidic applications.
- Can be built for less than \$100 using off-the-shelf components in less than an hour.
- Developed its user interface using PyQt5 and installable from Pypi; later migrated to a fully-featured web application written with React.js.

 [pachterlab/colosseum](https://github.com/pachterlab/colosseum)

Sept 2019 - Jun 2020

## kb-python

PACHTER LAB

- 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.

 [pachterlab/kb\\_python](https://github.com/pachterlab/kb_python)

Oct 2019 - Jun 2020

## NGS Pipeline

GINKGO BIOWORKS

- 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.

Jun 2019 - Sept 2019

## Alaska

STERNBERG LAB

- 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.

 [lioscro/alaska-parse](https://github.com/lioscro/alaska-parse)

Jan 2017 - Aug 2019

## Publications

- |      |  |                     |
|------|--|---------------------|
| 2021 | <b>Low-cost, scalable, and automated fluid sampling for fluidics applications</b> , author | <i>Under review</i> |
| 2021 | <b>Modular and efficient pre-processing of single-cell RNA-seq</b> , author                | <i>Published</i>    |

## Presentations

### SURF Seminar Day

PRESENTER FOR <A FRAMEWORK FOR AUTOMATED, COMPLETE RNA-SEQ ANALYSIS>

- Presented work done on Alaska during summer fellowship.

*Pasadena, CA*

*Oct 2018*

### 21st International *C. elegans* Conference

POSTER PRESENTER FOR <A FRAMEWORK FOR AUTOMATED, COMPLETE RNA-SEQ ANALYSIS>

- Introduced Alaska, an RNA-seq analysis pipeline for nematodes.

*Los Angeles, CA*

*Jun 2017*

## Awards & Honors

- |      |   |                     |
|------|---|---------------------|
| 2018 | <b>Semi-finalist</b> , Perpall Speaking Competition         | <i>Pasadena, CA</i> |
| 2018 | <b>Fellow</b> , Samuel P. and Frances Krown SURF Fellowship | <i>Pasadena, CA</i> |
| 2017 | <b>Fellow</b> , SURF Fellowship                             | <i>Pasadena, CA</i> |

## Skills

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