

**MIRAE SUNNY KIM**  
miraesunnykim@gmail.com

## EDUCATION

Rice University

**Computer Science, Doctor of Philosophy (PhD) – in progress**

**May 2025**

Relevant courses: Secure and cloud computing, Probabilistic algorithms and data structure, Logic in computer science, Network analysis, Sequence analysis, Machine learning with graphs  
Advisor: Vicky Yao

The University of Texas at Austin

**Biomedical Engineering, Master of Science in Engineering (MSE)**

**May 2020**

“Deep Learning-Based Classification of Breast Cancer Cells Using Transmembrane Receptor Dynamics” GPA: 4.00/4.00  
Advisors: Hsin-Chih (Tim) Yeh, Thomas E. Yankeelov

The University of Texas at Austin

**Biomedical Engineering, Bachelor of Science in Biomedical Engineering (BSBME)**

**May 2020**

University Honors Fall 2015, 2018, Spring 2016, 2017, 2018, 2019  
GPA: 3.74/4.00

## PUBLICATIONS

**Kim, M.\***, Hong, S.\*, Yankeelov, T. E., Yeh, H. C.#, & Liu, Y. L.# (2022). Deep learning-based classification of breast cancer cells using transmembrane receptor dynamics. *Bioinformatics*, 38(1), 243-249. **2022**

**Kim, M.**, & Liu, Y. L. (2021). Transmembrane Receptor Dynamics as Biophysical Markers for Assessing Cancer Cells. In *Handbook of Single-Cell Technologies* (pp. 865-885). Singapore: Springer Singapore. **2021**

Liu, Y. L., Perillo, E. P., Ang, P., **Kim, M.**, Nguyen, D. T., Blocher, K., ... & Yeh, H. C. (2020). Three-dimensional two-color dual-particle tracking microscope for monitoring DNA conformational changes and nanoparticle landings on live cells. *ACS nano*, 14(7), 7927-7939. **2020**

Liu, Y. L., Horning, A. M., Lieberman, B., **Kim, M.**, Lin, C. K., Hung, C. N., ... & Chen, C. L. (2019). Spatial EGFR dynamics and metastatic phenotypes modulated by upregulated EphB2 and Src pathways in advanced prostate cancer. *Cancers*, 11(12), 1910. **2019**

Liu, Y. L., Chou, C. K., **Kim, M.**, Vasisht, R., Kuo, Y. A., Ang, P., ... & Yeh, H. C. (2019). Assessing metastatic potential of breast cancer cells based on EGFR dynamics. *Scientific reports*, 9(1), 1-13. **2019**

\* indicates co-first authorship, # indicates co-corresponding

## EXPERIENCES

Dr. Vicky Yao, Computer Science

**Graduate Research Assistant/Fellow**

**Aug 2020-Present**

Employ data science and build biology-aware implementations of machine learning for drug target discovery, tissue specificity, and epigenetics. Largescale single-cell and bulk sequencing and microarray data analysis using R and Python.

Enveda Therapeutics

**Data Science Intern**

**May 2023-Jul 2023**

Proficiently design and deploy scoring algorithms for plant-based bioactive molecules using Python. Enhance the accuracy and precision of established pipelines through adept assimilation of existing methodologies.

Dr. Hsin-Chih Yeh in “NanoBiosensor and Molecular Tracking Lab”, Biomedical Engineering

**Research Assistant**

**Jan 2016-May 2020**

Build an artificial neural network to classify cancer based on single-particle tracking (SPT) trajectories in Python. Develop an assay using fluorescent microscopy, SPT, LabView, and molecular dynamics. Perform cell research and analyze trajectory data using MATLAB.

ElectronInks

**Engineering Lab Intern**

**Jan 2019–May 2019**

Formulate and test conductive silver inks for biomedical applications using organic chemistry and experimental data analysis.

Dr. Martha Maas in “Laboratory for Introductory Biology”, College of Natural Science

**Undergraduate Lab Assistant**

**Aug 2016-Dec 2018**

Instruct lab sessions each week with topics related to biotechnology, anatomy, and more. Assist in grading lab etiquette and performance.

POSTERS

- Kim, M.,** Cui, Y., & Yao, V., Predicting tissue and cell type specific DNA methylation using structured learning. *ISMB* (2022), W-063. **2022**
- Liu, Y. L., Horning, A. M., Lin, C. K., Lieberman, B., Hung, C. N., Chou, C. W., Liss, M. A., **Kim, M.,** ... & Chen, C. L. Upregulated EPHB2 and SRC pathways modulate spatial EGFR dynamics and malignant phenotypes and predict poor prognosis in prostate cancer. *Cancer Res* (2019) 79 (13\_Supplement): 173. **2019**
- Liu, Y.-L., Chou, C. K., **Kim, M.,** Vasisht, R., Liu, C., Perillo, E. P., ... & Yeh, H.-C. Effect of Epithelial-Mesenchymal Transition on EGFR Dynamics Revealed by Single-Particle Tracking. *Biophysical Journal*, 114(3), 534a. **2018**
- Liu, Y.-L., Horning, A. M., Perillo, E. P., Liu, C., **Kim, M.,** Vasisht, R., ... & Yeh, H.-C. Development of Biophysical Markers That Quantify Metastatic Potentials of Prostate Cancer Cells using Tsunami Microscope. *Biophysical Journal*, 112(3), 396a. **2017**

AWARDS AND HONORS

- Ken Kennedy CS&E Fellowship **Aug 2020**
- Loewenstern Fellowship **Aug 2020**
- First Place – Undergraduate Research Symposium and Poster Competition **May 2018**  
“Effect of Epithelial-Mesenchymal Transition on EGFR Dynamics Revealed by Single-Particle Tracking”
- Undergraduate Research Fellowship **Jan 2018**  
“Receptor dynamics as an innovative physical phenotyping assay for detecting metastatic cancer”

TEACHING, MENTORING, AND LEADERSHIP

- Rice Graduate Student Ambassador **Fall 2022-Spring 2024**
- Christina Wong, Undergraduate Student, Department of Computer Science **Spring 2023**
- COMP429: Intro to Computer Networks **Spring 2023**
- Executive board, Korean Graduate Student Association **Fall 2022-Spring 2023**
- COMP572: Bioinformatics: Networks **Spring 2022**
- Huzaifa Ali, Undergraduate Student, Department of Computer Science **Spring 2022**
- Jackie Wu, Undergraduate Student, Department of Computer Science **Fall 2021**