ASHLEY TSANG

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EDUCATION

University of Michigan, Ann Arbor, MI 2023–Present
- PhD in Bioinformatics

Johns Hopkins University, Baltimore, MD 2022–2023
- MSE in Biomedical Engineering

Johns Hopkins University, Baltimore, MD 2018–2022
- BS in Biomedical Engineering and Computer Science

PUBLICATIONS

[1] Biopsy Needle Accessory
Robert Liddell, Deborah Weidman, **Ashley Tsang**, Gohta Aihara, Tatiana Pereira, Bibhav Poudel, Jacob Desman, Katherine Kovrizhkin, Sean Darcy, Jinghua Zhang, Shababa Matin
PCT US2022/077146, filed Sept. 29, 2022. Patent pending.

[2] Adequacy of samples obtained via percutaneous core-needle rebiopsy for EGFR T790M molecular analysis in patients with non-small cell lung cancer following acquired resistance to first-line therapy: A systematic review and meta-analysis
Bibhav Poudel, Jacob Desman, Gohta Aihara, Deborah I Weidman, **Ashley Tsang**, Katherine Kovrizhkin, Tatiana Pereira, Siddharth Arun, Tejus Pradeep, Shababa Matin, Robert P Liddell
Cancer Treatment and Research Communications, 2021.

[3] Inferring cellular and molecular processes in single-cell data with non-negative matrix factorization using Python, R, and GenePattern Notebook implementations of CoGAPS
Jeanette Anna Irene Johnson*, **Ashley Tsang***, Jacob T Mitchell, Emily F Davis-Marcisak, Thomas Sherman, Ted Liefeld, Melanie Loth, Loyal Goff, Jacquelyn Zimmerman, Ben Kinny-Köster, Elizabeth Jaffee, Pablo Tamayo, Jill Mesirov, Michael Reich, Elana J Fertig, Genevieve L Stein-O'Brien
(*equal contribution) *Nature Protocols, 2023.*

[4] Deep Learning Model for Static Ocular Torsion Detection Using Synthetically Generated Fundus Images
Chen Wang, Yunong Bai, **Ashley Tsang**, Yuhan Bian, Yifan Gou, Yan X. Lin, Matthew Zhao, Tony Y. Wei, Jacob M. Desman, Casey Overby Taylor, Joseph L. Greenstein, Jorge Otero-Millan, Tin Yan Alvin Liu, Amir Kheradmand, David S. Zee, Kemar E. Green
Translational Vision Science and Technology, 2022.

RESEARCH EXPERIENCES

Wirtz/Wu Lab @ JHU, Graduate Researcher 2022–2023
- Supervised by Dr. Denis Wirtz and Dr. Pei-Hsun Wu to develop framework for histopathology analysis.
- Proposed a two-stage learning architecture for nuclei instance segmentation from sparsely annotated nuclei instances, reducing labeling costs and improving generalization.
- Collaborating with pathologists from Johns Hopkins Hospital to apply model for ovarian cancer diagnosis.

Stein-O'Brien Lab @ JHU, Graduate Researcher 2022–2023
- Supervised by Dr. Genevieve Stein-O'Brien to implement additional features for improving PyCoGAPS usability and performance.
- Leveraging PyCoGAPS to conduct analyses on new biological single-cell datasets.

Fertig Lab @ JHU, Undergraduate Research Assistant 2021–2022

- Supervised by Dr. Elana Fertig and Dr. Genevieve Stein-O'Brien to develop PyCoGAPS, a Python package of CoGAPS for non-negative matrix factorization of single-cell datasets.
- Reduced runtime by 65%, on the scale of tens of hours, for large datasets compared to CoGAPS.
- Created frameworks with GenePattern Notebook and Docker, and implemented additional analysis tools for simple and effective usage by biologists and scientists.

Malone Center for Engineering in Healthcare @ JHU, Undergraduate Research Assistant 2019-2020

- Supervised by Dr. Anand Malpani to develop interface for annotating frames of cataract surgery procedures.
- Implemented traditional computer vision methods for segmentation of pupil across frames.
- Curated dataset for model development and researched deep learning methods for task.

PROFESSIONAL EXPERIENCES

PneuTech, Co-Founder and Lead 2019–Present

- Supervised by Dr. Robert Liddell and collaborate with JHU engineering students to develop novel medical device that improves lung biopsy safety and efficacy.
- Created a patent-pending device that attaches to the current biopsy system, allowing a standard straight biopsy needle to angle and navigate around critical structures safely.
- Presented as finalists in five student competitions and one medical device conference, completed three accelerator programs, and secured over $65K in non-dilutive funding.

Delineo Disease Modeling, Undergraduate Research Co-Lead 2020

- Supervised by Dr. Anton Dahbura to lead research software development team of 17 JHU undergraduate and graduate engineering students to develop a personalized, predictive model for the spread of COVID-19.
- Processed large-scale geolocation data to extract meaningful features for analysis and led subteam of students to explore supervised learning methods to detect anomalies in data.
- Worked with team to build interactive web interface for public and public policy usage.

Department of Applied Mathematics and Statistics @ JHU, Teaching Assistant Fall 2020

- Planned and led weekly discussion sections, held office hours, and graded assignments and exams.

AWARDS & HONORS

UM Biomedical Informatics and Data Science Fellowship 2023

- Selected as a fellow for the university supported training program.

Biomedical Engineering Departmental Honors 2022

- Awarded to JHU students who earn a GPA of 3.5 or above in their biomedical engineering courses.

Computer Science Departmental Honors 2022

- Awarded to JHU students who earn a GPA of 3.5 or above in their computer science courses.

Innovators of Progress Scholarship Award 2021

- Received 1 of 3 scholarships awarded to student entrepreneurs in the DC/Maryland/Virginia area.

SKILLS

Programming Languages

- Python, Java, C/C++, MATLAB, R

Machine Learning Frameworks

- PyTorch, NumPy