

Bowen Chen

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RESEARCH INTERESTS

Machine Learning, Computer Vision, Visual-Language Pretraining, Representation Learning, Natural Language Processing, Reinforcement Learning, Medical Image Analysis, Computational Pathology

EDUCATION

Stanford University

Ph.D. in Biomedical Data Science

Sep 2024 –

Harvard University

A.B. in Computer Science and Statistics

Sep 2018 – May 2022

Overall GPA: 3.93/4.00

Magna cum laude (based on overall GPA cutoff, major GPA, and senior thesis reviews)

Harvard College Scholar (top 10% of class based on GPA)

TECHNICAL SKILLS

Computer Skills: Python, PyTorch, R, C++, JavaScript

Relevant Coursework (@Harvard): Machine Learning (CS 181), Probability (Stat 110), Inference (Stat 111), Linear Models (Stat 139), Comp Bio and Bioinformatics (Stat 115), Data Structures & Algorithms (CS 124), Computing hardware (CS 141), Programming Languages (CS 152), Groups & Vector Spaces (Math 122), Evolutionary Dynamics (Math 153)

RESEARCH EXPERIENCE

Computational Pathology Research Associate (PI: Faisal Mahmood)

March 2020 - May 2024

Pathology, Brigham and Women's Hospital, Harvard Medical School

Boston, MA

- Researching low cost deployment of deep learning models for computational pathology and integration with custom-built optics hardware for real-time, point-of-care diagnosis.
- Completed undergraduate thesis titled “A Multi-resolution Hard Attention Model to Select Regions of Interest on Whole Pathology Slide Images”. Received honors rating of high plus.
- Developing deep learning methods involving computer vision and vision-language pretraining for classification and survival prediction on gigapixel pathology whole slide images.
- Creating visual-language foundation models for pathology images and text.
- Developing an interactive multimodal assistant for pathology.

PUBLICATIONS

1. Ming Y Lu*, **Bowen Chen***, Drew FK Williamson*, Richard J Chen, Kenji Ikamura, Georg Gerber, Ivy Liang, Long Phi Le, Tong Ding, Anil V Parwani, Faisal Mahmood
“A Foundational Multimodal Vision Language AI Assistant for Human Pathology”
***Equal contribution**
Nature, 2024
2. Ming Y Lu*, **Bowen Chen***, Drew FK Williamson*, Richard J Chen, Ivy Liang, Tong Ding, Guillaume Jaume, Igor Odintsov, Andrew Zhang, Long Phi Le, Georg Gerber, Anil V Parwani, Faisal Mahmood
“Towards a Visual-Language Foundation Model for Computational Pathology”
***Equal contribution**
Nature Medicine, 2024
3. Richard J Chen*, Tong Ding*, Ming Y Lu*, Drew FK Williamson*, Guillaume Jaume, Andrew Song, **Bowen Chen**, Andrew Zhang, [10 others], Long Phi Le, Georg Gerber, Faisal Mahmood
“A General-Purpose Self-Supervised Model for Computational Pathology”
***Equal contribution**
Nature Medicine, 2024

4. Andrew H. Song, Mane Williams, Drew F.K. Williamson, Sarah S.L. Chow, Guillaume Jaume, Gan Gao, Andrew Zhang, **Bowen Chen**, Alexander S. Baras, Robert Serafin, Richard Colling, Michelle R. Downes, Xavier Farré, Peter Humphrey, Clare Verrill, Lawrence D. True, Anil V. Parwani, Jonathan T.C. Liu, Faisal Mahmood
 “Weakly Supervised AI for Efficient Analysis of 3D Pathology Samples”
Cell, 2024
5. Kendra Sirak, Julian Jansen Van Rensburg, Esther Brielle, **Bowen Chen**, Iosif Lazaridis, Matthew Mah, [12 others], David Reich.
 “Medieval DNA from Soqotra points to Eurasian origins of an isolated population at the crossroads of Africa and Arabia”
Nature Ecology and Evolution, 2024
6. Ming Y Lu*, **Bowen Chen***, Andrew Zhang, Drew FK Williamson, Yung-Sung Chuang, Richard J. Chen, Tong Ding, Long Phi Le, Faisal Mahmood.
 “Visual Language Pretrained Multiple Instance Zero-Shot Transfer for Histopathology Images”
 ***Equal contribution**
Conference on Computer Vision and Pattern Recognition (CVPR), 2023
7. Jana Lipkova, Richard J Chen, **Bowen Chen**, Ming Y Lu, Matteo Barbieri, Daniel Shao, Anurag J Vaidya, Chengkuan Chen, Luoting Zhuang, Drew FK Williamson, Muhammad Shaban, Tiffany Y Chen, Faisal Mahmood
 “Artificial intelligence for multimodal data integration in oncology”
Cancer Cell, 2022
8. **Bowen Chen**, Ming Y. Lu, Jana Lipkova, Faisal Mahmood.
 “Abstract PR-01: Real-time, point-of-care pathology diagnosis via embedded deep learning”
Clinical Cancer Research, 2021

CONFERENCE PRESENTATIONS

- | | |
|---|---------------------------------------|
| CVPR 2023
<i>IEEE / CVF</i> | June 2023
<i>Vancouver, Canada</i> |
| · “Visual Language Pretrained Multiple Instance Zero-Shot Transfer for Histopathology Images” (Poster) | |
| Discover Brigham 2022
<i>Brigham and Women’s Hospital</i> | Nov 2022
<i>Boston, MA</i> |
| · “Localizing Regions of Interest in Whole Slide Images via Reinforcement Learning” (Poster) | |
| Discover Brigham 2021
<i>Brigham and Women’s Hospital</i> | Nov 2021
<i>Boston, MA</i> |
| · “A 3D-Printed Embedded AI-based Microscope for Pathology Diagnosis” (Poster) | |
| Pathology Visions 2021
<i>Digital Pathology Association</i> | Oct 2021
<i>Las Vegas, NV</i> |
| · “A 3D-Printed Embedded AI-based Microscope for Pathology Diagnosis” (Oral talk) | |
| GPU Technology Conference (GTC) 2021
<i>NVIDIA</i> | April 2021
<i>Virtual</i> |
| · “Real Time, Point-of-Care Pathology Diagnosis via Embedded Deep Learning on NVIDIA Jetson Nano” (Poster) | |
| AACR Conference on Artificial Intelligence, Diagnosis, and Imaging 2021
<i>American Association for Cancer Research</i> | Jan 2021
<i>Virtual</i> |
| · “Real Time, Point-of-Care Pathology Diagnosis via Embedded Deep Learning” (Plenary Talk) | |

Discover Brigham 2020

Nov 2020

*Brigham and Women's Hospital**Virtual*

- “Real Time, Point-of-Care Pathology Diagnosis via Embedded Deep Learning” (Live Demo)

Pathology Visions 2020

Oct 2020

*Digital Pathology Association**Virtual*

- “Real Time, Point-of-Care Pathology Diagnosis via Embedded Deep Learning” (Poster)

AWARDS AND HONORS

Discover Brigham Research Excellence Award

2022

Brigham and Women's Hospital

Awarded to posters demonstrating innovative research at the annual institution-wide Discover Brigham conference (20 out of 160+ posters).

Magna cum laude

2022

Harvard College

Awarded based on GPA cutoff and senior thesis reviews.

Pathology Academic Celebration Finalist

2021

Harvard Medical School

Poster competition for students in pathology at Harvard Medical School.

Pathology Visions Best Research Award

2020

Digital Pathology Association

Awarded to poster that demonstrates best research in the Pathology Visions conference (1 out of 50+ posters).

Harvard College Scholar

2019

Harvard College

Top 10% of class based on GPA.

ACADEMIC JOURNAL REVIEWER SERVICE

Journal of Digital Imaging

TEACHING AND LEADERSHIP EXPERIENCE

Course Assistant for Mathematics

Fall 2019 – Spring 2020

*Harvard University**Cambridge, MA*

- Undergraduate course assistant for MATH 21A Multivariable Calculus and MATH 21B Linear Algebra and Differential Equations
- Assisted instructor during class-time to aid student learning and answer questions
- Organized weekly review sessions and office hours to review concepts and problems
- Graded homework assignments with other teaching assistants

Mental Health Peer Counselor

2019 – 2022

*Harvard University**Cambridge, MA*

- Staffed 12-hour overnight shifts every two weeks. Provided anonymous, non-directive (person-centered) mental health counseling for peers
- Tech director (2021 – 2022). Implemented automations to notify staffers via SMS for COVID testing and postering reminders