Yuan Pu

Email: yuanpu.00@gmail.com | Homepage: yuan-pu.github.io | Updated: December 2025

Education

Duke University — Aug 2025 – Present
Doctor of Philosophy Program in Computer Science — *Durham, NC*

Brown University — Aug 2019 – May 2023
Bachelor of Science in Computational Biology (Computer Science track) — *Providence, RI*

- GPA: 4.0/4.0; magna cum laude; Computational Biology Departmental Honors

Selected Publications (*co-first authorship)

[C1] **Trajectory Flow Matching with Applications to Clinical Time Series Modelling** | *NeurIPS 2024 (spotlight)*

Xi Zhang*, Yuan Pu*, Yuki Kawamura, Andrew Loza, Yoshua Bengio, Dennis Shung, Alexander Tong

[C2] **Human-Algorithmic Interaction Using a Large Language Model-Augmented Artificial Intelligence Clinical Decision Support System** | *CHI 2024*

Niroop Channa Rajashekar*, Yeo Eun Shin*, Yuan Pu*, Sunny Chung, Kisung You, Mauro Giuffrè, Colleen Chan, Theo Saarinen, Allen Hsiao, Jasjeet Sekhon, Ambrose Wong, Leigh Evans, René Kizilcec, Loren Laine, Terika McCall, Dennis Shung

[C3] **Counting Clinical Clues: A Lightweight Probabilistic Baseline Can Match an LLM** | *ML4H 2025 (findings)*

Furong Jia*, Yuan Pu*, Finn Guo, Monica Agrawal

[J1] **Assessing the Usability of GutGPT: A Simulation Study of an AI Clinical Decision Support System for Gastrointestinal Bleeding Risk** | *npj Digital Medicine, 2025*

Sunny Chung, Mauro Giuffrè, Niroop Rajashekar, Yuan Pu, Yeo Eun Shin, Simone Kresevic, Colleen Chan, Shinpei Nakamura-Sakai, Kisung You, Theo Saarinen, Allen Hsiao, Ambrose H Wong, Leigh Evans, Terika McCall, Rene Kizilcec, Jasjeet Sekhon, Loren Laine, Dennis Shung

[J2] **Machine Learning on Multiple Epigenetic Features Reveals H3K27ac as a Driver of Gene Expression Prediction Across Patients with Glioblastoma** | *PLOS Computational Biology, 2025*

Yusuke Suita, Hardy Bright, Jr., Yuan Pu, Merih Deniz Toruner, Jordan Idehen, Nikos Tapinos, Ritambhara Singh

[J3] **Timing of Antiplatelet Resumption in Hospitalized Patients with Acute Gastrointestinal Hemorrhage Undergoing Endoscopy after Percutaneous Coronary Intervention: A Real-World, Nationwide Observational Analysis** | *Under-review*

Darrick K. Li*, Yuan Pu*, Yihang Liu*, Kisung You, Michael G. Nanna, Alyssa Harris, Joseph JY Sung, Loren Laine, Dennis L. Shung

Research Experience

Graduate Student — Aug 2025 – Present
Duke University NLP - ECLAIR Lab — *Durham, NC*

Pragmatic Alignment for Patient-Facing AI | *advised by Monica Agrawal*

- Ongoing project to improve AI-powered patient-facing medical communication by analyzing gaps between clinician and LLM responses using clinician edits to AI-generated patient-portal messages and comparisons of LLM replies versus verified care-provider responses on clinical Reddit posts. Expect to produce pragmatic alignment updates, evaluation metrics, and guardrails for safe, accurate, and empathetic deployment.

Co-occurrence Counts Based Probabilistic Ranking of Probable Diagnosis | *advised by Monica Agrawal*

- Participated in the design and test of a lightweight probablistic ranking method that leverages corpus frequencies of clinical concepts and diagnoses to answer clinical multiple choices questions. Achieved accuracy on par with a 7B LLM trained on the same data and showed complementary strengths, clarifying what portion of benchmark gains can be attributed to simple frequency-based reasoning.

Postgraduate Associate — Aug 2023 – May 2025
Yale School of Medicine H+AIM Lab — *New Haven, CT*

Clinical Time Series Modeling with Flow Matching | *advised by Dennis Shung and Alex Tong*

- Developed Trajectory Flow Matching, a novel method for training Neural Stochastic Differential Equations, addressing the scalability issue by leveraging the flow matching technique and enhancing performance with uncertainty prediction, interval prediction, and conditional modeling. Demonstrated this approach's state of art modeling ability on irregularly-sampled, noisy clinical time series.

Human-Algorithmic Interaction Evaluation of Clinical Decision Support System | *advised by Dennis Shung*

- Collaborated on evaluating usability and trust in human-computer interaction for an AI-augmented clinical decision support system. Collected user-system interaction data through medical simulations, surveys, and interviews. Lead quantitative and qualitative data analysis.

Patient Data Analysis | *advised by Dennis Shung and Darrick Li*

- Performed data extraction and analysis using a clinical database of over 670,000 patients. Investigated patient characteristics, medication management, and other potential risk factors associated with percutaneous coronary intervention, post-intervention gastrointestinal bleeding, and further clinical outcomes.

Undergraduate Research Assistant — May 2022 – May 2023

Brown University Singh Lab — *Providence, RI*

Epigenetic Regulation of Gene Expression in GSCs | *advised by Ritambhara Singh*

- Implemented attention-augmented RNNs to predict gene expression from epigenetic data in glioblastoma stem cells (GSCs). Investigated epigenetic regulation of gene transcription in different GSCs by cross-patient analysis.

Data Science Intern — Jan 2022 – May 2023

Brown University Computational Biology Core — *Providence, RI*

EGME's Impact on Sperm Small RNA Expression | *advised by Daniel Spade and August Guang*

- Processed and analyzed small RNA sequencing data from rat sperm cells exposed to Ethylene Glycol Monomethyl Ether (EGME). Identified dosage-dependent differentially expressed small RNAs, their target genes, and enriched biological pathways, advancing insights into EGME's testicular toxicity.

Undergraduate Research Assistant — Sept 2020 – Jan 2022

Brown University Yajima Lab — *Providence, RI*

Germline Factor DDX4's Role in Cancer | *advised by Mamiko Yajima*

- Conducted survival analysis on patient clinical records and genomic profiles, revealing that higher DDX4 expression correlates with shorter survival in acute myeloid leukemia (AML). Identified differentially expressed genes between high and low DDX4 groups and enriched biological pathways, providing insights into DDX4's role in AML.

Teaching Experience

Teaching Assistant at Brown University

CSCI1430 Computer Vision | *instructed by James Tompkin* — Spring 2023

CSCI1810/2810 Computational Molecular Biology | *instructed by Sorin Istrail* — Fall 2022

CSCI1430 Computer Vision | *instructed by James Tompkin* — Spring 2022

Review and Event Services

Reviewer for *ML4H*, *CSCW*, *HAI* — 2025

Roundtable Junior Chair Clinician-AI Interaction | *ML4H* — 2024

Other Experience

Research Intern AI-powered 3D interior design | *Dymaxion* — Nov 2023 - Aug 2024

Awards and Honors

NeurIPS Scholar Award $2400 grant covering conference registration and hotel accommodations — 2024

Brown University Magna Cum Laude — 2023

Brown University Computational Biology Departmental Honors — 2023

Sigma Xi Scientific Honor Society — 2023

Hack@Brown 2022 Wolfram Award — 2022

Brown SPRINT LINK Program $2000 grant for summer undergraduate research with faculty — 2021