# CINDY ZHANG

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## EDUCATION

**University of Washington** 2025 – 2029 (expected)
**PhD in Biomedical Informatics and Medical Education (BIME)**
Advisor: Dr. Brody Foy
Research Focus: AI-Enabled Precision Medicine: Modeling Physiologic Setpoints from Blood Tests

**Johns Hopkins University** 2019 – 2023
**BS in Computer Science with Honors, BS in Biomedical Engineering with Honors**
Minor in Applied Mathematics and Statistics
Member of Habitat for Humanity, Society of Women Engineers
GPA: 3.59/4.0

## EXPERIENCE

**Research Engineer** June 2024 – Present
*University of Washington Medical Center* *Seattle, WA*

- Developed a Bayesian framework to adaptively model personalized reference intervals from time-series laboratory marker data, optimizing hyperparameters for multiple models.
- Parallelized and optimized pipelines to process gigabytes of diverse laboratory data, evaluating hidden Markov models, state-space models, and Bayesian inference models with model validation and calibration.
- Applied Kaplan-Meier analysis and Cox proportional-hazard modeling to investigate the prognostic utility of intra-patient hematologic setpoints, validating clinical significance across large datasets.

**Senior Programmer Analyst** *Precision Medicine Analytics Platform, Johns Hopkins Health System* June 2023 – June 2024
*Baltimore, MD*

- Deployed InBasket Clinical Message Triage model classifying 100,000+ patient messages, reducing cognitive load on physicians and staff.
- Piloted BERTopic-based retraining to improve interpretability and performance, mitigating model drift.
- Ensured data quality, privacy compliance, and integration consistency across the Precision Medicine Analytics Platform and downstream clinical research workflows.
- Validated WHO Clinical Progression with physicians, reducing runtime by 94% (3 hours to 11 minutes).
- Facilitated Clinical Research Management System (CRMS) to OnCore transition and interoperability.

**Undergraduate Researcher** Aug 2022 - May 2023
*Translational Informatics Research and Innovation Lab* *Baltimore, MD*

- Crowdsourced responses for a COVID-19 Qualtrics study using Amazon Mechanical Turk.
- Designed a prototype Android app to assist pregnant women in seeking reliable health information.
- Developed an electronic health record converter between HL7 and Eventflow formats.
- Investigated MyChart logs for patterns of continuity of care and assessed association with sociodemographics and divergent health outcomes.

**Systems Engineer** May 2022 - Aug 2022
*Johnson & Johnson* *Santa Clara, CA*

- Executed C++ test suites in a Linux environment to characterize a drift in robotic surgical arm joints
- Drove system shutdown requirements to prevent excessive drift.

· Verified design documents and requirements across engineering teams.
· Developed and documented automated scripts to link and populate Airtable databases.
· Refactored JAMA REST API methods and designed an automated error-logging strategy using Python.

**Researcher and Software Developer** Nov 2021 - May 2022
*Applied Physics Laboratory* *Laurel, MD*
· Proofread AI-annotated neural connectomes to verify image segmentation of neurons and synapses.
· Conceptualized game-ification of connectome proofreading to facilitate human reinforcement learning.
· Wrote C# code to generate 3-D large-scale neuron meshes for the Unity game.

**Delineo Disease Modeling** Jan 2021 - Nov 2021
· Implemented a Wells-Riley model to simulate the spread of diseases in a parameterizable town.
· Lead a simulation team of 5 people to decrease simulation time for 6 months of infection by 59%.

## PUBLICATIONS

**Machine Learning and Artificial Intelligence-Based Clinical Decision Support for Modern Hematology**. *Clinics in Laboratory Medicine* (In Press, 2025). Zhang C, Lam BD, Lucas F, Foy BH.

**Haematologic Setpoints Are a Stable and Patient-Specific Deep Phenotype**. *Nature*, Dec 2023. DOI: 10.1038/s41586-024-08264-5. PMID: 37808854. Foy BH, **Zhang C**, et al.

**OPTIC: Optimizing Patient-Provider Triaging & Improving Communications in Clinical Operations Using GPT-4 Data Labeling and Model Distillation**. *arXiv*, Feb 2025. DOI: 10.48550/arXiv.2503.05701. Santamaria-Pang A, **Zhang C**, et al.

**Machine Learning Approach to Predict Emergent RV PV Loop Phenotypes in Pulmonary Hypertension**. *Pulmonary Circulation*, accepted Feb 2025. Presented at Design Day, Johns Hopkins University, May 2023. Sivakumar N, **Zhang C**, et al.

**Assessing Associations Between COVID-19 Symptomology and Adverse Outcomes After Piloting Crowdsourced Data Collection**. *JMIR Formative Research*, Nov 2022. DOI: 10.2196/37507. PMID: 36343205. Flaks-Manov N, **Zhang C**, et al.

## PRESENTATIONS

**Modeling Physiologic Setpoints from Blood Tests to Quantify Human Regulation**. *UW Scholars' Studio*, Seattle, WA, Nov 2025 (Speaker). Zhang C.

**Adaptive AI Models for Personalized Laboratory Reference Intervals**. *UW IMDS Symposium*, Seattle, WA, Feb 2025 (Speaker). Zhang C.

## HONORS

**Dean's List**, Johns Hopkins University 2021–2023
**Leader of Tomorrow**, GapSummit Global Biotech Leadership Forum 2024
**Volunteer Recognition Award**, St. Cloud Hospital, MN 2017

## SKILLS

**Programming:** Python (NumPy, Pandas, scikit-learn, PyTorch), SQL, MATLAB, C/C++, Java, JavaScript/TypeScript, LaTeX

**Data Engineering:** ETL design, Azure Data Factory, Databricks (Delta Live Tables), SQL Server, PostgreSQL, Spark, Splunk

**Tools:** Git, Jupyter, Docker, React/Node, BERTopic, GPT-4, LLaMA2

## CERTIFICATIONS

**Registered Yoga Teacher (RYT-200)**, Yoga Alliance 2025
Certified through The Yoga Shala, Seattle

**Epic Cogito, Clarity, and Caboodle Certified**, Epic Systems Corporation 2024
Credentialed in enterprise analytics, data warehousing, and clinical reporting within the Epic ecosystem.