

MORGAN SANCHEZ

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Using machine learning to turn longitudinal healthcare data into clinically actionable insights and tools at scale.

EDUCATION

Harvard University

PhD in Bioinformatics and Integrative Genomics (Advisor: Arjun Manrai)

M.A. in Biomedical Informatics

NLM/NHGRI training grant fellow · Relevant Training: NLP (MIT), Genetics, Pathology, Biochemistry

Johns Hopkins University

B.S. in Biomedical Engineering, General & Dept. Honors, Alpha Eta Mu Beta, Tau Beta Pi

Peabody Conservatory

B.M. in Voice, George Woodhead Prize in Voice, Pi Kappa Lambda

Boston, MA

Sept 2026

Feb 2026

Baltimore, MD

May 2021

Baltimore, MD

May 2021

TECHNICAL SKILLS

Modeling & Evaluation: longitudinal modeling, survival analysis, competing risks, rare-event prediction, cross-validation, bootstrapped evaluation, clinical impact evaluation

Domains: healthcare data (EHR, medical imaging), clinician-AI collaboration

Programming Languages

Python, R, SQL

Tools: PyTorch, AWS, Git, Docker

RESEARCH EXPERIENCE

Research Associate | Harvard Medical School, Manrai Lab

Boston, MA

Oct 2026-present

PhD Researcher | Harvard Medical School

Boston, MA

Manrai Lab

2022-2026

- Led development of trajectory-based survival models for kidney failure risk prediction (N=270K+), improving AUPRC and calibration over standard clinical equations
- Designed end-to-end ML pipeline for longitudinal EHR data, including cohort extraction and validation, feature engineering, and bootstrapped evaluation (AUPRC, AUROC, Brier, NRI), enabling robust rare-event prediction and risk stratification (DuckDB, Dask, joblib)
- Co-first author on large-scale study (N=1.9M) using Fine-Gray competing risks models to evaluate kidney function estimation equations, demonstrating broad clinical and epidemiological implications
- Conceived and led NHANES study (N=44K) quantifying population-scale implications of kidney function uncertainty and evaluating confirmatory testing strategies; first-author paper selected for oral presentation at PSB
- Communicated modeling progress and results to external industry collaborators, translating technical findings into actionable insights for clinical and research stakeholders

Rajpurkar Lab

2022-2023

- Led end-to-end research project evaluating whether disagreement prediction models can reduce clinician workload in radiologist-AI collaboration, contributing to first author publication in *Cell Reports Medicine*
- Coordinated multi-institution collaboration (Harvard, Stanford, VinBrain) and mentored junior researchers, enabling successful project execution and publication

Lichtman Lab

2021-2022

- Contributed to preprint on large-scale correlative microscopy resource for Alzheimer's pathology and presented findings at 2022 NLM T15 Conference, winning Best Research Idea award
- Adapted pretrained synapse detection model (mouse → human) by designing post-processing pipeline to reduce false positives, integrating membrane segmentation, size filtering, and 3D spatial constraints
- Analyzed synapse density and plaque proximity in Alzheimer's disease using large-scale microscopy data, contributing to insights on spatial relationships in neurodegeneration

Undergraduate Researcher | Johns Hopkins Applied Physics Laboratory

Laurel, MD

- Developed spiking neural network models for segmentation and object tracking

2018-2021

- Built full-stack web application for querying large-scale connectomics datasets (Python, Flask, SQL, MongoDB) as part of a cross-institutional team (JHU, Harvard, Google)

- Conducted interdisciplinary research across machine learning, computer vision, neuroscience, and robotics (Trailblazer Award)

- Sanchez, M.,** Diao, J.A., Cummings, J., Makov-Assif, M., Friedman, L.A., Cohen, S., Shah, A.P., Reis, B., Balicer, R.D., Dagan, N. and Manrai, A.K., 2026. Laboratory Trajectories Improve Kidney Failure Risk Estimation. *arXiv preprint arXiv:2607.17000*.
- Sanchez, M.,** Cummings, J., Diao, J.A., Reis, B.Y., Balicer, R.D., Dagan, N. and Manrai, A.K., in press. Quantifying the Clinical Implications of Imprecision in Kidney Function Estimates. *Pacific Symposium on Biocomputing*. **Selected for oral presentation.**
- Sanchez, M.,** Alford, K., Krishna, V., Huynh, T.M., Nguyen, C.D., Lungren, M.P., Truong, S.Q. and Rajpurkar, P., 2023. AI-clinician collaboration via disagreement prediction: A decision pipeline and retrospective analysis of real-world radiologist-AI interactions. *Cell Reports Medicine*.
- Sanchez, M.,** Moore, D., Johnson, E.C., Wester, B., Lichtman, J.W. and Gray-Roncal, W., 2022. Connectomics Annotation Metadata Standardization for Increased Accessibility and Queryability. *Frontiers in Neuroinformatics*, 16.
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LEADERSHIP AND IMPACT

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| Tutor Harvard Medical School Department of Biomedical Informatics | Boston, MA |
| <ul style="list-style-type: none">Mentored students in deep learning, teaching core concepts including backpropagation, convolutional networks, distribution shift, and graph-based learning | Spring 2024 |
| Teaching Fellow Harvard Medical School Department of Biomedical Informatics | Boston, MA |
| <ul style="list-style-type: none">Supported students in applied data science (R), through office hours and assignment feedbackConducted meta-analysis of student projects, synthesizing results across independent studies and presenting aggregate findings | 2023-2024 |
| Workshop Instructor (Volunteer) UMBC Meyerhoff Scholars Program | Boston, MA |
| <ul style="list-style-type: none">Co-designed and delivered bioinformatics workshop, including interactive group activities | Fall 2023 |
| Teaching Fellow, CIRCUIT-ASPIRE Program Manager Johns Hopkins Applied Physics Laboratory | Laurel, MD |
| <ul style="list-style-type: none">Served as primary mentor and liaison for cohort of 6 high school researchers embedded in interdisciplinary teams, coordinating with supervisors to ensure meaningful project placement and engagementLed candidate selection (interviews and evaluation) and developed onboarding materials, providing 1:1 and group mentorship to support technical growth | 2019-2020 |