# Vignesh (Viggy) Vanchinathan

Wu Tsai Institute, Yale University

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## Education

2021–2025 **Bachelor of Science**, Biomedical Engineering (concentration in Biomedical Data Science) and Applied Mathematics (concentration in Statistics and Statistical Learning), minor in Computer Science, Johns Hopkins University, Baltimore, MD.

Graduated with General Honors and Departmental Honors in Biomedical Engineering.

**Relevant coursework.** *Machine learning & computation:* Machine Learning, Natural Language Processing, Introduction to Computational Mathematics. *Mathematics:* Linear Algebra, Probability, Mathematical Statistics, Vector Calculus, Differential Equations, Nonlinear Dynamics, Introduction to Optimization. *Biomedical engineering:* Biomedical Data Science, Systems and Controls, Biological Models and Simulations, Statistical Physics.

## Honors & grants

2025 **Instructional Enhancement Grant Program** — Student Fellow

2025 **Best Talk Award, Runner-Up** — MATRX 2025 Undergraduate Conference

2024 **Bloomberg Distinguished Professors Summer Program** — Fellowship Awardee ($6,000 stipend, Dr. Andrew P. Feinberg's lab) (declined)

2024 **Life Design Summer Scholarship** — $2,500, Hopkins Life Design Lab, to support internship at Forschungszentrum Jülich

2024 **Whiting Undergraduate Conference Travel Fund** — $1,000, Whiting School of Engineering, for IAPRD 2024 conference travel

2023 **SynBioBeta x BitsinBio Student Grant** — 3-day conference pass plus $500 travel grant

2021–2025 **Dean's List** (4 of 8 semesters)

2021 **National Merit Finalist & Scholar**

## Research experience

Oct 2025–Present **Yale University, Wu Tsai Institute**. *Postgraduate Associate*. Advisor: Dr. Daniel Levenstein.

Jan 2023–Sept 2025 **Johns Hopkins University, Biomedical Engineering Department**. *Research Team Lead*. Advisors: Michelle Zwernemann, Dr. James Brasic, Dr. Stephen Grill, Dr. Alexander Pantelyat.

June 2024–Sept 2025 **Forschungszentrum Jülich, Institute for Neuroscience and Medicine**. *Research Intern*. Advisors: Dr. Clara Rentz, Dr. Martina Minnerop.

Oct 2024–June 2025 **Johns Hopkins University, Applied Mathematics and Statistics Department**. *Research Assistant*. Advisor: Tamás Budavári.

June–Aug 2021 **Broad Institute of MIT and Harvard**. *Summer Intern*. Advisor: Dr. Ang Cui.

June–Aug 2020 **Broad Institute of MIT and Harvard**. *Broad Summer Scholar*. Advisors: Kevin Dong, Dr. Vivian Hecht, Dr. Noam Shoresh.

## Professional experience

June–Aug 2023 **Kano Therapeutics**. *Research Intern*.

## Publications

in press Rentz C, Reinhardt A, Jung N, **Vanchinathan** V, Peterburs J, Jacobi H, Timmann D, Thieme A, Brötz D, Bellebaum C, Schnitzler A, Amunts K, Minnerop M. **Three-week Video- and Home-based Training Program for Ataxia Patients: A Pilot Randomized Controlled Trial.** Accepted at *Movement Disorders Clinical Practice*.

in prep **Vanchinathan** V, Farah M, Singh A, Hernandez M, Pantelyat A, Grill S. **Short intervals of inertial measurement unit data collected during activities of daily living provide a quantitative and low-cost method to assess disease severity and functional ability in Parkinson disease.** Manuscript in preparation; planned submission as a preprint to medRxiv.

in prep Puvvadi S, **Vanchinathan** V (co-first authors), Reinhardt A, Kaiser V, Hauke F, Dukart J, Turna M, Boltes M, Jacobi H, Timmann D, Thieme A, Schnitzler A, Amunts K, Rentz C, Minnerop M (co-senior authors). **Reliability and Discriminative Validity of Digital Motor Biomarkers in Ataxia and Parkinson's Disease.** Manuscript in preparation.

## Talks & Posters

2026 **Vanchinathan** V, Levenstein D. **The world model of a deep RL agent develops place cells with episodic and generative replay.** Neurocomputation Seminar Series, Yale University. November 20, 2026.

2026 **Vanchinathan** V, Levenstein D. **Hippocampal-like representation of space emerges in a deep reinforcement learning agent trained in naturalistic, egocentric environments.** [Abstract] Accepted to present in November 2026 at the Society for Neuroscience Annual Meeting.

2026 Rentz C, **Vanchinathan** V, Puvvadi S, Reinhardt A, Kaiser V, Hauke F, Dukart J, Turna M, Boltes M, Jacobi H, Timmann D, Thieme A, Schnitzler A, Amunts K, Minnerop M. **Test-Retest Reliability and Clinical Validity of Digital Gait Biomarkers Across Different Movement Analysis Systems in Cerebellar Ataxia.** [Abstract] Accepted to present at the International Congress for Ataxia Research (ICAR) 2026, Atlanta, GA. November 2026.

2026 **Vanchinathan** V, Levenstein D. **Egocentric, goal-directed navigation produces hippocampal-like representation in a deep RL world model.** [Poster] QBio/PEB Symposium 2026, Yale University. May 29, 2026.

2025 **Vanchinathan** V, Farah M, Singh A, Zhang C, Osei-Owusu N, Desai R, Palani R, Hamkins J, Zwernemann M, Grill S.E, Pantelyat A, Brasic J. **A Novel Quantitative Assessment to Evaluate Functional Impairment in Parkinson's Disease.** [Abstract/Poster] Presented at the Mid-Atlantic Research Day, Johns Hopkins University and University of Maryland BMES, April 19, 2025, and accepted to present in October 2025 at the Movement Disorder Society International Congress of Parkinson's Disease and Movement Disorders.

2025 Hovsepian T, **Vanchinathan** V, Luner A, Budavári T. **The Impact of Objective**

**Functions on Racing Strategy in Formula One.** [Abstract/Talk] Presented at the 2nd Annual Mid-Atlantic Research Exchange (MATRX) for Undergraduate Mathematicians 2025.

2024 **Vanchinathan** V, Farah M, Hamkins J, Osei-Owusu N, Palani R, Desai R, Singh A, Zhang C, Zwernemann M, Brasic J. **Identification of the needs of patients with Parkinson's disease through a qualitative research process.** [Abstract] Presented at the International Association of Parkinsonism and Related Disorders (IAPRD) World Congress 2024. *Parkinsonism & Related Disorders*. 2024;122:106677. doi:10.1016/j.parkreldis.2024.106677

2024 Elshourbagy A, Mostafa S, Allouzi S, Mohamed A, Hassan M, Loulida H, Eltaras M, Abdelshafy H, Sadaney A, Javed S, **Vanchinathan** V, Valik E, Palani R, Hamkins J, Belal R, Chiu I, Farah M, Abdelhalim M, Mora G, Osei-Owusu N, Brasic J. **Feasibility of sequential online motor assessment of patients with Parkinson disease by multiple raters in different locations.** *Mendeley Data*, V2, doi: 10.17632/kd5gtfjdwr.2

## Extracurricular experience

Sept 2023–Present **Technology Sourcing Lead**, Nucleate (Baltimore Chapter).

Jan–Apr 2024 **Directed Reading Program Participant**, Johns Hopkins University.

Feb–May 2025 **Directed Reading Program Participant**, Johns Hopkins University.

## Teaching experience

SP25 Teaching Assistant, Methods in Nucleic Acid Sequencing Laboratory (580.454)

SP24 Teaching Assistant, Systems Biology of the Cell (580.248)

FA24 Teaching Assistant, Biomedical Data Science & Laboratory (580.475/477)

FA24 Lab Teaching Assistant, Computational Medicine: Cardiology Laboratory (580.487)

SP24 Laboratory Manager, Structural Biology of Cells Laboratory (580.153)

SP23 Grader, Structural Biology of Cells (580.151)

Su 20–21 Teaching Assistant, BioBuilder (Synthetic Biology) Summer Program

## Technical skills

**Computational:** Python (numpy, pandas, scikit-learn, matplotlib, pytorch), R (ggplot, tidyverse), MATLAB, Java, C/C++, PyMOL, Jupyter Notebooks, Benchling, package development.

**Wet laboratory:** SDS-PAGE, qPCR preparation, Qubit analysis, bacterial culture, cell culture.