BRIAN NJOROGE GITAHI

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EDUCATION

Yale University — **New Haven, CT**
- Ph.D. Candidate: Physics | Advisor: Prof. Victor S. Batista — *Aug 2024 - Present*

Princeton University — **Princeton, NJ**
- Bachelor of Arts Degree (AB), Concentration: Physics — *Class of 2023*
- Certificates: French Language and Culture, Biophysics

Strathmore School — **Nairobi, Kenya**
- GPA: 4.0/4.0 ~ top 5% nationally in national examinations in both secondary and primary school — *Class of 2017*
- Honours: Class Valedictorian

FELLOWSHIPS AND AWARDS

- **2024 Lindau Nobel Laureate Meeting (Physics)** participant and recipient of **Bayer Foundation Fellowship**.
- **2023 Yale University Wu Tsai Institute Graduate Fellowship** Winner: Awarded to students showing "outstanding potential and interest in computational, technological, biological or psychological research that advances understanding of the mind and human cognition."
- **2022 CERN Non-Member State Summer Studentship:** Awarded to only ~40 students (out of nearly 3000 applicants) from countries outside the EU member states showing strong potential in physics/engineering to attend lectures and conduct research on site.
- **2018 EducationUSA Scholar Award (Kenya):** Awarded to the nation's top performing students in National examinations looking to prepare for SAT examinations and apply to study in US universities.
- **2017 Scholar of the Year (High School)** at Strathmore School: Awarded to the top-performing student in the final year of high school who has shown excellent and consistent academic performance during the 4 years of high school and in national examinations.
- **2013 Scholar of the Year (Primary School)** at Strathmore School: Awarded to the top performing student in the final year of Primary School who has shown excellent and consistent academic performance over the course of primary school and in the national examinations.

PUBLICATIONS AND ACADEMIC PAPERS

1. **"Silicon Sensor Characterization for the High Granularity Calorimeter at the CMS experiment"** - August 2022 (Internal publication)
2. **"Statistical Physics of Dynamic Representations in Neural Networks"** - May 2023 (Undergraduate Thesis)
3. **"Probing into Charged Lepton Flavour Violation via $\tau \rightarrow \mu\mu\mu$ at the CMS Detector"** - January 2022 (academic research paper)
4. **"Identification of Structure in Data: Examining the Relationship Between Border Cells and the Curvature of Manifold Inferences in Neural Dynamics"** - April 2022 (academic research paper)

APPOINTMENTS

1. **Graduate Student researcher** in Variational Methods for many-body systems advised by Victor S. Batista (September 2025 - Present)
2. **Data Analyst** at Allen Institute for Neural Dynamics supervised by Alex Piet, Uygar Sumbul and Karel Svoboda (August 2023 - July 2024)
3. **Undergraduate researcher and thesis student** in neurophysics advised by Manuel Schottdorf and David Tank (February 2022 - May 2023)
4. **Summer Student and research intern** at CERN in silicon sensor group advised by Jan Kieseler (June 2022 - August 2022)
5. **Undergraduate researcher** in particle physics group advised by Daniel R. Marlow (June 2021 - January 2022)

RESEARCH EXPERIENCE

Summer Student **June 2022 - August 2022**
CERN (European Organization for Nuclear Research) *Geneva, Switzerland*

- Spearheaded a sub team of three characterising new silicon sensors for a new particle detector component.
- Published a 19-page report with results and analysis of the tests run and presented to my supervisor and team.
- Attended lectures in high energy physics and detector construction and organized group viewing for students.

Undergraduate Research Assistant and Thesis Student **February 2022 - May 2023**
Department of Physics & Princeton Neuroscience Institute *Princeton, NJ*

- Conducted analyses providing insight into dimension reduction in recurrent neural networks.
- Studied structure in lower dimensional data from simulations of place cells in the hippocampus.
- Presented findings from year-long research to the Tank Lab and Department of Physics senior thesis committee.
- Submitted an undergraduate thesis (40-page) to the Department of Physics based on research conducted.

Undergraduate Research Assistant **June 2021 - January 2022**
Department of Physics, Princeton University *Princeton, NJ*

- Advanced the analysis of lepton decay (forbidden tauonic decays) data at the CMS in collaboration with professor Daniel Marlow.
- Produced an academic research paper on computational high energy research conducted during the semester.

TALKS, PRESENTATIONS AND POSTERS

- **"Machine Learning Models as a Variational Ansatz for Ground State Optimization":** Department of Physics Research Qualifying Event presentation - December 2025
- **"Investigating the Shape of Neural Activity in Mice":** Poster presentation at RAs/DAs Poster session at the Allen Institute - May 2024
- **"Manifold Embedding with CEBRA":** Guest talk at the Cell Types/Data group in the Institute for Brain Science - April 2024
- **"Statistical Physics of Dynamic Representations in Neural Networks"** : Talk at the Tank Lab group meeting (Princeton Neuroscience Institute) presenting thesis research, also presented to Princeton Physics thesis committee in a different presentation - May 2023
- **"Single Diode Frequency Study"** : Presentation to the Silicon Sensor Group at the CMS experiment in CERN for my summer student project update - July 2022
- **"Charged Lepton flavour violation via Tau leptons at the CMS detector"** : Presentation to Daniel Marlow's High Energy Physics research group at Princeton University - September 2021

PROFESSIONAL EXPERIENCE & LEADERSHIP

Data Analyst **August 2023 - July 2024**
Allen Institute for Neural Dynamics *Seattle, Washington*

- Designed and built a cloud-based analysis pipeline that analysed 200+ sessions of neuromodulator imaging data.
- Developed my own tools package for use with the manifold embedding algorithm leveraged in this pipeline.
- Modularized and implemented a data processing protocol and made it accessible to other scientists.
- Developed a simple simulation to understand the fluorescence signal of neuromodulator imaging data.

Data Scientist **January 2023**
QuantCap *Boston, Massachusetts*

- Coordinated 4 person team in scraping, ingesting, cleaning, and manipulating data for use in analyses.
- Analysed, visualised, and presented insights from relevant datasets to help guide analyses.
- Collaborated with a 4 person team to construct, train and optimise different models that resulted in a Random Forest Classifier with 78% accuracy and a predicted profitability of 40%.

Co-Director **July 2020 - September 2022**
Africa Summit at Princeton Planning Committee *Princeton, NJ*

- Supervised a team of 11 with a budget of $10,000+ and collaborated with fellow undergraduate, graduate and postdoctoral students and professors to craft the structure of various panel discussions.
- Hosted 5+ panel discussions that resulted in four successful campaigns attended by over 1000 people.
- Recruited 10+ speakers with a combined reach of hundreds of thousands of followers on social media.

TEACHING EXPERIENCE

Teaching Fellow
Yale University

- PHY 170: Physics for the Life Sciences *(Fall 2025)*. Teaching Fellow
- PHY 345: Introduction to Quantum Information Processing and Communication *(Spring 2025)*. Teaching Fellow
- PHY 170: Physics for the Life Sciences *(Fall 2024)*. Teaching Fellow

Teaching Assistant
Princeton University

- MAT 103: Calculus I *(Spring 2022)*. Undergraduate Teaching Assistant
- MAT 100: Precalculus *(Fall 2021)*. Undergraduate Teaching Assistant

SKILLS AND INTERESTS

Software: Java, Python, Mathematica, Latex, MATLAB, ROOT, PyTorch, Keras
Languages: English (Fluent), French (Advanced), Kiswahili (Fluent), Kikuyu (Mother Tongue)