Rahul Joseph Fernandez

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EDUCATION

Cornell University — Biostatistics and Data Science (M.Sc)   2020 - 2022

Azim Premji University - School of Arts and Sciences — Economics (B.A) and Biology (B.Sc, minor)   2016 - 2019

EXPERIENCE

Cornell University   **November 2022 - Present**
Senior Research Assistant

Developed deep learning models for the prediction of nursing home closures leveraging complex longitudinal time-series data, resulting in accuracies over 80%. Built internal data application/dashboard that generates user specified automatic reports and statistical analyses on large volumes of nursing home data.

Cornell University   **August 2021 - December 2021; May 2022 - November 2022**
Research Assistant

Built and maintained large longitudinal databases on mergers and acquisitions in the nursing home, hospice, and physician practice space, employing web scrapers on several public data sources including CMS data, SEC filings, press releases, news reports, etc. Conducted sophisticated econometric analysis on the effects of mergers, acquisitions, policies, etc, on facility and patient outcomes which led to publications in journals such as Health Affairs and the Journal of the American Medical Association.

Cornell University   **August 2022**
Master's Capstone/Thesis

Employed natural language processing (NLP) methods to identify indicators of social isolation on social media corpora during the COVID-19 pandemic. This work was selected for a conference presentation at the American Medical Informatics Association (AMIA) Informatics Summit in 2022.

Azim Premji University - School of Arts and Sciences   **August 2019 - August 2020**
Research Assistant

Led research on the dynamics of free-ranging dogs distributions in peri-urban mosaics with a focus on building spatio-temporal ecological models that account for anthropogenic spatial covariates. Employed network/graph theory to understand potential epidemiological phenomena on contact data obtained from dog populations, and the implications of their networks on disease propagation. Implemented code for calculations of a novel edge-based spatial density method for ecological home-range estimations.

Azim Premji University - School of Arts and Sciences   **January 2018 - May 2019**
Undergraduate Researcher

Conducted extensive research on the spatial distribution and dynamics of free-ranging dogs (FRDs) in a peri-urban ecosystem employing methods from ecology, economics, mathematics, network science, and complex systems theory. Collected over 2000 individual data points and built predictive species distribution models for FRD distributions in complex transition landscapes, using machine learning. Developed methods to test natural ecological hypotheses in systems with anthropogenic factors.

PUBLICATIONS, PREPRINTS, CONFERENCE AND WORKING PAPERS

- Williams Jr, D., **Fernandez, R.**, Stevenson, D., Unruh, M., & Braun, R. T. (2024). Nursing home finances associated with real estate investment trust and private equity investments. *Health Affairs Scholar*, *2*(4), qxae037.

- Braun, R. T., Williams, D., Stevenson, D. G., Casalino, L. P., Jung, H. Y., **Fernandez, R.**, & Unruh, M. A. (2023). The Role Of Real Estate Investment Trusts In Staffing US Nursing Homes: Study examines the role of real estate investment trusts in staff levels at US nursing homes. *Health Affairs*, *42*(2), 207-216.

- Braun, R. T., Unruh, M. A., Stevenson, D. G., Prigerson, H. G., **Fernandez, R.**, Yao, L. Z., & Casalino, L. P. (2023). Changes in diagnoses and site of care for patients receiving hospice care from agencies acquired by private equity firms and publicly traded companies. *JAMA Network Open*, *6*(9), e2334582-e2334582.

- Stevenson, D., Peterson, H., Skinner, R., Ndrianasy, E., Braun, R. T., Unruh, M., & **Fernandez, R**. (2023). Trends in Ownership Structures of US Nursing Homes and the Relationship with Facility Traits and Quality of Care (2013-2022). Office of the Assistant Secretary for Planning and Evaluation (ASPE).

- Vyasanakere, J., Ray-Mukherjee, J., & **Fernandez, R. J**. (2022). Edge-focused network-based approach: an improved kernel density estimator for home range. *bioRxiv*, 2022-08. (under review, preprint available at: https://www.biorxiv.org/content/10.1101/2022.08.21.504698v1)

- Thangarajah, M., **Fernandez, R. J.**, Pathak, J., & Patra, B. G. (2022). Identifying Social Isolation from Twitter and Reddit Data during the COVID-19 Pandemic. American Medical Informatics Association (AMIA) (conference paper)

- Braun, R. T., Rosenkranz, D. R., **Fernandez, R. J.**, Stevenson, D. G., Grabowski, D., Jimenez, L., & Bowblis, J. (2024). Assessing Facility, Resident, and Financial Characteristics Associated with HUD 232-Sponsored Loan Participation in Nursing Homes. (under review)

- Braun, R. T., Casalino, L. P., **Fernandez, R. J.**, Nicholson, S., Richards, M., Valez, M., O'Connell, B., McInerney, D., Lake, D., Pierre, R., & Khullar, D. (2024). Association of Optum Ownership of Physician Practices with Medicare Advantage Risk Scores. (under review)

- **Fernandez, R. J.**, Braun, R. T., Williams Jr, D., Lake, D., Stevenson, D. G. & Casalino, L. P. (2024). Predicting Nursing Home Closures using Machine and Deep-Learning Methodologies on Longitudinal Data. (working paper)

- Skinner, R. J, Yu, J., Unruh, M. A., Braun, R. T., Hye-Young, J., Johnson, P., **Fernandez, R. J.**, & Stevenson, D. G. (2024). Staffing Standards in Nursing Homes: Federal and State Perspectives (working paper)

- Lake, D., Braun, R. T., **Fernandez, R. J.**, Nicholson, S., Richards, M., & Casalino, L. P. (2024). The Impact of Health Insurer Acquisitions of Physician Practices on Prices and Patient Visits. (working paper)

- Lake, D., Braun, R. T., **Fernandez, R. J.**, Nicholson, S., Richards, M., & Casalino, L. P. (2024). The Impact of Health Insurer Acquisitions of Physician Practices on Physician Turnovers. (working paper)

CONFERENCES, WORKSHOPS, AND ADDITIONAL COURSEWORK

- Dynamics of Complex Systems Graduate Summer Workshop, International Centre for Theoretical Sciences, Tata Institute for Fundamental Research (TIFR) (2019)

- The Ecological Society of Australia (ESA) Conference 2019, Tasmania — FRD Research Presented November 2019

- Annual Biology Research Seminar, Azim Premji University — Poster Presentation

- CORE Economics Conference, Azim Premji University — Organizer
- DataCamp (14 courses completed)
- Thinking and Working with Data, Azim Premji University
- Introductory Linear Algebra Summer Course, Azim Premji University
- Introduction to Ordinary Differential Equations (coursera.org/verify/ERSZNF3B5MMV)

SKILLS

Programming — Python, R, STATA, C++ (SFML), SQL

Software — NetLogo, ArcGIS/QGIS, Google Earth Engine, Git/Github

Machine/Deep Learning — Sklearn, TensorFlow/Keras & PyTorch (ML/DL), Spacy (NLP), PySpark, CUDA

CERTIFICATES AND ACCOMPLISHMENTS

- Certificate of Completion - Dynamics of Complex Systems — International Centre for Theoretical Sciences, TIFR (2019)
- Annual Charity Run 5k First Place Award — Bethany Institutions (2018)
- Certificate of Internship — IndiaHikes (2017)
- Dormitory RA — Azim Premji University (2017)
- Certificate of Accomplishment — IndiaHikes (2014) (2016) (2017) (2017) (2017)
- Annual Charity Run Certificate — Bethany Institutions (2013) (2014) (2015) (2016) (2017)
- Certificate of Recognition — Bethany Junior College (2015)
- Perfect Bethanite Award — Bethany Junior College (2015)
- Certificate of Accomplishment — Bethany Institutions (2015)
- Certificate of Leadership — TalentEase (2014)

ADDITIONAL ACTIVITIES AND PARTICIPATION

- Co-Founding and Core Committee Member, The Film Club — Azim Premji University 2016 — 2019
- Co-Founding and Core Committee Member, Road Runners Club — Azim Premji University. 2016 — 2019
- Core Committee Member, The Cycling Club — Azim Premji University 2016 — 2019
- Member, Climate Educators Network — 2023 - ongoing

EXTRACURRICULARS

- Blog Writing (https://medium.com/@rahuljosephfernandez)
- 2D game development (Python/Godot)
- Agent-Based Modeling Games (NetLogo)
- Guitar, Tennis, Skateboarding