

Naveen Kannan

RESEARCH ASSOCIATE

Cleveland, Ohio | United States Permanent Resident

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Data Scientist and Bioinformatician with 2+ years of research experience applying advanced data analytics and machine learning to human genomic data. Background in practicing clinical medicine with domain expertise in microbiology and pathology. Experienced in automated deployment of scientific workflows with cutting edge machine learning tools, data analytics tools, and bioinformatics tools, with a strong passion for enabling easy access to Big Data tools and containers.

Work Experience

Research Associate

Cleveland, Ohio

POPULATION HEALTH AND QUANTITATIVE HEALTH SCIENCES, CASE WESTERN RESERVE UNIVERSITY

MAY 2023 - Present

- Configured automated deployment of **Postgres database server** using **Ansible** - established multiple databases and schemas, populated data, managed users and privileges, and implemented security controls.
- Developed **generative adversarial network (GAN)** to simulate realistic human genomic data - trained model on 1000 Genomes enabling simulation of artificial haplotypes passing quality checks for LD, HWE, and more for pending journal publication.
- Engineered Mamba-driven **Docker/Singularity** containers, **reducing build times by 3x**, transferred Docker storage cache to a physical hard drive, eliminating future storage errors, and created Dockerized servers with Data Science/ Bioinformatics tools.
- Established, configured, and maintained VM and Raspberry Pi bare-metal servers, documenting the set-up, and automated the deployment of **HDFS, YARN, Hadoop and Spark/PySpark** on them along with **bioinformatics (Hail, Glow) tools** using **Ansible**.
- As part of the Alzheimer's Disease Sequencing Project, annotated and scored **362 million structural genetic variants linked to Alzheimer's Disease**, followed by **statistical analysis and presentation of findings** at the ASHG (American Society of Human Genetics) Conference in Washington DC (November 2023).

Graduate Research Assistant

Cleveland, Ohio

POPULATION HEALTH AND QUANTITATIVE HEALTH SCIENCES, CASE WESTERN RESERVE UNIVERSITY

JANUARY 2023 - MAY 2023

- Engineered Docker containers for streamlined deployment of specialized R packages and Python modules, optimizing analyses for single-cell RNA datasets.

Graduate Research Assistant

Cleveland, Ohio

GIS HEALTH AND HAZARDS LAB, SCHOOL OF MEDICINE, CASE WESTERN RESERVE UNIVERSITY

MAY 2022 - DECEMBER 2022

- Automated extraction of tent GPS coordinates from DRC refugee camp video feeds post Mt. Nyiragongo's eruption using **Python** and **Pytorch** to implement ML for tent detection and heat map generation of migration patterns for peer-reviewed publication.

Junior Resident Doctor

Chennai, India

DEPARTMENT OF PSYCHIATRY, SAVEETHA MEDICAL COLLEGE

JULY 2020 - SEPTEMBER 2020

- Evaluated and diagnosed psychiatric illnesses, and met the assigned goal of management of five patients per day.

Junior Resident Doctor

Chennai, India

MADRAS MEDICAL COLLEGE

MARCH 2019 - MARCH 2020

- Rotated through the following departments: Internal Medicine, General Surgery, Obstetrics and Gynecology, Community Medicine, Psychiatry, Emergency Trauma Ward, Labor Ward.

Skills

Operating Systems	Programming Languages	Software	Geospatial Analytics	Markup Languages	Version Control	Machine Learning	Bioinformatics Tools
Unix, Debian Linux, Fedora Red Hat Linux, Windows 11	Python, R, Bash, SQL	Hadoop/Spark, Hive, Jupyter, Docker, Singularity, SLURM, Ansible	Geopandas, sf(R), QGIS, ArcGIS	LaTeX, Markdown, RMarkdown	Git, GitHub, gh client	PySpark, Tensorflow, Pytorch, pandas, scikit-learn, numpy, scipy	samtools, BCFtools, HTSlib, Tabix, Hail, Glow

Education

MSc in Biomedical and Health Informatics

Cleveland, Ohio

CASE WESTERN RESERVE UNIVERSITY

JANUARY 2022 - AUGUST 2023

- GPA-3.9

Leadership

Steiner House International Co-op

Cleveland, Ohio

VICE PRESIDENT, ADMISSIONS MANAGER, AND ORDERING MANAGER

MAY 2022 - OCTOBER 2022

- Spearheaded integration initiatives for new residents, fostering community through monthly social events, while screening and interviewing prospective residents.
- Managed inventory for Steiner House, ensuring a continuous supply of consumables and non-consumables.

Personal Projects

Mapping the Environmental Impact of the Norfolk Southern Train Derailment in Ohio.

Case Western Reserve University

[HTTPS://NAVEEN-KANNAN.SHINYAPPS.IO/FINAL_EAST_PALESTINE_DASHBOARD_2](https://naveen-kannan.shinyapps.io/final_east_palestine_dashboard_2)

2023

- Developed scripts to scrape air and water quality data from USGS and AirNow AQI for counties within a 30-mile radius of a train derailment, creating an interactive Shiny dashboard in R for users to analyze and visualize temporal and spatial trends in water and air quality across affected counties in Ohio, West Virginia and Pennsylvania.

Data Science Blog

Cleveland, Ohio

[HTTPS://NAVEENKANNAN.NETLIFY.APP/BLOG_MAIN.HTML](https://naveenkannan.netlify.app/blog_main.html)

2022

- Created beginner-friendly tutorials on Docker containerization, Spark/Hadoop big data engineering, GPU programming, and MLOps. Content geared towards demystifying complex data science concepts for students and early career professionals.

Publications

- Jayakrishnan Ajayakumar ^a, Andrew J. Curtis ^a, Felicien Maisha ^b, Sandra Bempah ^c, Afsar Ali ^{b,d}, J. Glenn Morris Jr. ^{b,e}, **Naveen Kannan** ^a, and Grace Armstrong ^a, ^aDepartment of Population and Quantitative Health Sciences, School of Medicine, Case Western Reserve University, Cleveland, Ohio, USA; ^bEmerging Pathogens Institute, University of Florida, Gainesville, Florida, USA; ^cDepartment of Geography, Kent State University, Kent, Ohio, USA; ^dDepartment of Environmental & Global Health, College of Public Health and Health Professions, University of Florida, Gainesville, Florida, USA; ^eCollege of Medicine, University of Florida, Gainesville, Florida, USA, Using Spatial Video and Deep Learning for Automated Mapping of Relief Camps. **[Manuscript under review]**
- **N. Kannan**¹, N. Wheeler¹, Genome Center for Alzheimer's Disease, L-S. Wang², Y. Leung², W. S. Bush¹; ¹Cleveland Inst. for Computational Biology, Dept. for Population and Quantitative Hlth.Sci., Case Western Reserve Univ., Cleveland, OH, ²Dept. of Pathology and Lab. Med., Penn Neurodegeneration Genomics Ctr., Perelman Sch. of Med., Univ. of Pennsylvania, Philadelphia, PA., Annotation and scoring of the deleteriousness of individual genetic variants in the 4th release of the Alzheimer's Disease Sequencing Project;(PB4451). Presented at the Annual Meeting of The American Society of Human Genetics, November 3, 2023, in Washington DC.
- Suebsarn R., W. T., **Naveen K.**, Ellis W., Atsadaporn N., Chitchanok B., Chantira C., Christine S., Heba A. Using regression analysis and machine learning approach to understand the association between comorbidities, medication nonadherence, activity of daily living, and heart condition status among older adults in the United States. **[Manuscript under review]**
- Segamalai, D., Abdul Jameel, A. R., **Kannan, N.**, Anbalagan, A., Duraisamy, B., Raju, P., & Devy Gounder, K. (2017). Mediastinal pseudocyst: varied presentations and management—experience from a tertiary referral care centre in India. *HPB Surgery*, 2017.
- Vellaisamy, R., **Kannan, N.**, Anbalagan, A., Raju, P., Duraisamy, B., Murugesan, C. S., & Gounder, K. D. (2016). Endoscopic access to hepatic duct through duodenum during follow up—after primary surgery for hepatolithiasis. *HPB*, 18, e530.
- Ramasamy, V., Vellaisamy, R., **Kannan, N.**, & Gounder, K. D. (2016). Refined technique of access loop in hepatobiliary surgery. *HPB*, 18, e593-e594.
- **Kannan, N.**, Vellaisamy, R., Govindarajan, M., & Gounder, K. D. (2016). Pellagra following pancreaticoduodenectomy for malignant pancreatic carcinoid with pluripotent hormonal potential. *HPB*, 18, e381-e382.