

PRADEEP VARATHAN PUGALENTHI

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Summary of Qualifications

I am a PhD Bioinformatics and Neuroscience student, defending my thesis in March 2024 and looking for bioinformatics, computational and diagnostics research roles.

- Exceptional understanding of biology, statistics, machine learning, network analysis, statistical software high throughput computing, cloud computing and neuroimaging analysis
- Well-developed ability to conduct presentations and take information to apply the acquired knowledge to interpret trends especially in Alzheimer's data.
- Experienced leader: Founded and occupied professional student registered organizations and lead research groups in the clubs to national conferences.

Education

- PhD Student in **Bioinformatics** with a minor in Neuroscience, Aug 2019 – March 2024
Indiana University, Indianapolis
Fully funded with scholarship and stipend
Tentative CGPA – 3.875/4
- Bachelor of Technology in **Biotechnology**, Aug 2015 – May 2019
National Institute of Technology Calicut, Kozhikode
Scholarship from Central Government of India
CGPA – 8.62/10

Internship Experience

- Advanced Analytics and Algorithms Intern, Roche Diagnostics, Indianapolis Mar 2023– Aug 2023
- Built a complete MVP project to scale on predictive classification of subjects in **Explorys** Raw Dataset with diabetes into difference classes of progressors to other comorbidity diseases using **R** for prefilltering and **python** for **boosting** algorithms (patent applied)
 - Deploying and tuning neural network models in **tensorflow** for predictive modelling of glucose using non-invasive parameters to allow better comorbidity progression care of patients.
 - Lead the Professional Development Committee for interns and organized workshops and resource-sharing platforms for whole intern class of 2023 in Roche.
- Data Analyst Intern, Sage Bionetworks, Seattle Mar 2020– Nov 2020
- Worked on developing the **metanetwork** package with multiple network building algorithms, module construction algorithms and finally building a consensus network over different methods in **R** while collaborating over git and confluence, using the **AWS** cluster and MUNNIN supercomputer.
 - Worked on creating a new **pipeline** using **YML** config files and created terminal-R based wrappers for the entire process and created a new package to process metanetwork and connect with **Synapse**
 - Built a CentOS-based **docker** container to run the whole pipeline in R and include Singularity for HPC work.
- Research Intern, Basal Ganglia Explorers, IIT madras Jul 2018 – Sep 2018
- Created a model network of neurons depending on the subject conditions to characterize various energy requirements of a particular disease. ([Click here for more info](#))

Work Experience

Co-Lecturer, Indiana University, Indianapolis

Aug 2020 – Present

- Assisting and lecturing for the course Biomedical Informatics course and Computational Systems for undergraduate and graduate students learning multiple software including **BlueSky**, **R**, **Python** and Excel.

Research assistant, Indiana University, Indianapolis

Aug 2019 – Present

- Worked on identification of Alzheimer's disease pathways from ROSMAP (Religious Orders Study and Memory and Aging Project) data and trying to build relation between imaging and cognitive scores for genetic correlation using **Cytoscape**, as a network analysis tool and **R** for statistical inference purpose.
- Analyzed the genome-wide analysis study from International Genomics of Alzheimer's Project using statistical methods including **SMR**, **HEIDI** and **TWAS** by creating a pipeline scripted on **Linux** using the **plink** toolkit and **SMR** toolkit
- Used **Expecto** deep learning model in python with the help of **pytorch** to investigate Alzheimer's Disease variants profile and built a **MultiSpecto** model to research on LD block variant combinations.
- Performed **GNN** based **GLRP** model to decrypt pathology of AD using ROSMAP expression profile with **tensorflow**

Recent Research Projects

Metabolomics in AD, Indiana University, Indianapolis

- Worked on **UKBioBank** metabolomics dataset to obtain a **brain-age** (biological age) and associate with MRI phenotypes
- Built an event based modelling for CSF, plasma and blood biomarkers on ADNI , along with other metabolites to obtain different ordering for AD subjects as a test for diagnosis

Deep Learning AD Research, Indiana University, Indianapolis

- Research on multiple deep learning platforms including **Expecto**, GLRP with the use of ROSMAP expression data to build a streamlined pipeline to obtain important modules and variants in AD.

Immune Inspect, Indiana University, Indianapolis

- Created an R package **ImmuneInspect** for easy analysis of the GEO2R-processed microarray data in respect to immune system as part of the coursework project and has been added to Artic Code Vault 2020.

Design Sprint, Indiana University, Indianapolis

- Research on ideas to curb homelessness and hunger issues around the city as a group and presented to the deputy mayor of Indianapolis ([Article](#))

Papers Published ([entire list](#))

Meta-analysis on big data of bioactive compounds from mangrove ecosystem to treat neurodegenerative disease by Benu George, Pradeep Varathan and Suchitra T.V in Scientometrics, Springer (DOI [10.1007/s11192-020-03355-2](https://doi.org/10.1007/s11192-020-03355-2))

Identification of functionally connected multi-omic biomarkers for Alzheimer's Disease using modularity-constrained Lasso by Linhui Xie, Pradeep Varathan, Kwangsik Nho, Andrew J. Saykin, Paul Salama and Jingwen Yan in Plos ONE special issue. (DOI [10.1371/journal.pone.0234748](https://doi.org/10.1371/journal.pone.0234748))

Integrative analysis of eQTL and GWAS summary statistics reveals transcriptomic alteration in Alzheimer brains by Pradeep Varathan, Priyanka G, Tanner Jacobs, Andrew J. Saykin and Jingwen Yan (DOI [10.1186/s12920-022-01245-5](https://doi.org/10.1186/s12920-022-01245-5))

Papers in process

Deciphering the tissue-specific functional effect of Alzheimer risk SNPs using deep genome annotation by Pradeep Varathan, Linhui Xie, Tanner Jacobs, Andrew J. Saykin and Jingwen Yan

Positions Held

President, Bioinformatics Club, IUPUI

Apr 2020 – Apr 2021

- Managing and leading the club to conduct safe and worthy content for events.
- Corresponding and managing tasks with other clubs and officials

Event Coordinator, Bioinformatics Club, IUPUI

Nov 2019 – Feb 2019

- Reserved and conducted events as planned by the club members
- Managed the club's Instagram page
- Helped to maintain the finances within the club