

# Prajal Bishwakarma

Seattle, WA

Email : prajal.b@gmail.com

Mobile : 914-282-9893

## EDUCATION

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- **College of William & Mary**

*B.S. Neuroscience, Minor: Computer Science*

Williamsburg, VA

*August 2013 – May 2017*

## RESEARCH EXPERIENCE

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- **College of William & Mary**

*Undergraduate Research Assistant; Advisor: Mainak Patel*

Williamsburg, VA

*September 2015 - May 2017*

- Investigated network interactions underlying gamma oscillation frequency modulation by activation of NMDA receptors in CA3 subregion using neuron models built in Python
- Reviewed literature to build integrate-and-fire network model
- Built signal processing pipeline for time series local field potential and spiking frequency data from simulations
- Created data visualizations of model behavior in R
- Participated in NSF funded EXTREEMS-QED summer research program
- Wrote and defended undergraduate honors thesis, *The Mechanism of NMDA Receptor Mediated Increase in Gamma Oscillation Frequency*

## PROFESSIONAL EXPERIENCE

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- **Allen Institute for Brain Science**

*Scientific Data Engineer III*

Seattle, WA

*January 2022 - Current*

- Built validation and extract, transform, load (ETL) pipeline in Python for analyzed single cell/nucleus RNAseq and spatial transcriptomics data in the Allen Brain Cell Atlas
  - \* Implemented transformers for whole mouse brain scale gene expression data stored in Anndata and SOMA formats for ingest into the Brain Knowledge Platform (BKP)
  - \* Implemented transformers for cell type taxonomy annotations for ingest into BKP
  - \* Interfaced with senior scientists to translate scientific organization of data to technical requirements for engineering teams
- Reviewed standards for metadata schemas in the BRAIN Initiative Cell Atlas Network (BICAN) consortium as a member of the Metadata and Ontologies Working Group
  - \* Promoted Findability, Accessibility, Interoperability, and Reusability (FAIR) principles for data sharing in consortium by proposing standards for APIs
- Maintained general ETL pipeline that supported data releases for various projects in the BKP Data Catalog:
  - \* BICAN Rapid Release - catalog of post-QC fastq files and associated sample metadata from BICAN omics projects
  - \* Genetic Tools Atlas - catalog of enhancer-adenovirus-associated viruses targeting cell types
  - \* SEA-AD Donor Index - catalog of donor metadata and neuropathology data from members of Seattle Alzheimer's Disease Brain Cell Atlas consortium
- Built integrations with multiple services supporting migration of data from monolithic laboratory information management system to service oriented architecture
- Built data intake web application for projects and data collections metadata in the BKP Data Catalog
- Mentored intern in implementing integration with service that tracks digital assets

- **Ernst & Young**

*Senior Software Engineer*

Arlington, VA

*December 2019 – February 2021*

Client: Pharmaceutical Firm

- Led team of four developers in Identity and Access Management (IAM) system implementation in Java
- Designed, implemented and documented features of IAM system
- Drafted qualification documentation for system implementation and deployment
- Managed project timeline and engineering backlog

Client: Manufacturing Firm

- Co-authored assessment of client IAM practices regarding existing Amazon Web Services (AWS) infrastructure
- Developed prototype integration between AWS IAM and client's existing IAM system

- Demonstrated prototype functionality both to internal and client leadership

#### Internal: Internship Project

- Architected and built front-end infrastructure for IAM system performance dashboard
- Led code reviews and mentored interns in engineering practices

- **Sila Solutions Group (Acquired by Ernst & Young)**

*Software Engineer*

Client: Financial Services Firm

Arlington, VA

*July 2018 - December 2019*

- Led team of developers/analysts in IAM feature implementation
- Presented project progress at weekly status meetings with client leadership
- Mentored new developers in engineering practices

- **Booz Allen Hamilton**

*Software Engineering Consultant*

Tyson's Corner, VA

*September 2017 - July 2018*

- Built RESTful API for search application in Python
- Implemented unsupervised, corpus agnostic named entity recognition algorithm
- Presented prototypes to senior leadership and potential clients

- **College of William & Mary**

*Tribe Athletics Tutor*

Williamsburg, VA

*September 2016 - May 2017*

- Tutored athletes in intro physics, chemistry, calculus and computer science

- **College of William & Mary**

*Chemistry Lab Teaching Assistant*

Williamsburg, VA

*September 2015 - May 2016*

- Led weekly undergraduate lab sessions in General Chemistry I/II

#### PUBLICATIONS

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- Yao, Z., van Velthoven, C.T.J., Kunst, M. et al. A high-resolution transcriptomic and spatial atlas of cell types in the whole mouse brain. *Nature* 624, 317–332 (2023). <https://doi.org/10.1038/s41586-023-06812-z>
- Hawrylycz M, Martone ME, Ascoli GA, Bjaalie JG, Dong H-W, Ghosh SS, et al. (2023) A guide to the BRAIN Initiative Cell Census Network data ecosystem. *PLoS Biol* 21(6): e3002133. <https://doi.org/10.1371/journal.pbio.3002133>
- Hunker AC, et al. Enhancer AAV toolbox for accessing and perturbing striatal cell types and circuits. *bioRxiv* [Preprint]. 2024 Sep 29:2024.09.27.615553. doi: 10.1101/2024.09.27.615553. PMID: 39386678; PMCID: PMC11463465.

#### PROJECTS

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- **groupbool.xyz**: Static music discovery and analytics blog. Built with GCP functions that aggregate Spotify data.
- **sentfrag**: Natural language processing implementation of editing techniques from "The Sense of Structure" by George D. Gopen