Prajal Bishwakarma

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EDUCATION

- **College of William & Mary** — Williamsburg, VA
  B.S. Neuroscience, Minor: Computer Science — *August 2013 – May 2017*

RESEARCH EXPERIENCE

- **College of William & Mary** — Williamsburg, VA
  Undergraduate Research Assistant; Advisor: Mainak Patel — *September 2015 - May 2017*

  - Investigated network interactions underlying gamma oscillation frequency modulation by activation of NMDA recepters 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

- **Allen Institute for Brain Science** — Seattle, WA
  Scientific Data Engineer III — *January 2022 - Curent*

  - 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-adeno-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 labaratory 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** — Arlington, VA
  Senior Software Engineer — *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)** Arlington, VA
  Software Engineer *July 2018 - December 2019*
  Client: Financial Services Firm

  - ○ 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** Tyson's Corner, VA
  Software Engineering Consultant *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** Williamsburg, VA
  Tribe Athletics Tutor *September 2016 - May 2017*

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

- **College of William & Mary** Williamsburg, VA
  Chemistry Lab Teaching Assistant *September 2015 - May 2016*

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

PUBLICATIONS

- 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: https://doi.org/10.1101/2024.09.27.615553 PMID: 39386678; PMCID: PMC11463465.

PROJECTS

- **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