Samuel Bharti

sbharti@uab.edu | Web: samuelbharti.com
GitHub: /samuelbharti | | LinkedIn: /samuelbharti

SUMMARY

Senior Ph.D. candidate in Computational Biology with over 5 years of combined academic and industry experience in multi-omics integration, single-cell RNA-seq, and cloud-based pipeline development. Proficient in R, Python, Docker, web app development and cloud infrastructure. Passionate about delivering reproducible, data-driven solutions to accelerate drug discovery and improve healthcare outcomes.

SKILLS

- **Programming & Scripting**: R, Python, Bash, JavaScript, MATLAB, SQL.
- **Dashboard & Software Development**: R Shiny, Streamlit, React, PHP, HTML, MySQL, MongoDB, JS, and CSS.
- **Bioinformatics**: WES, Bulk RNA-seq, scRNA-seq, Pseudobulk, Network, Spatial and multi-omics integration.
- **Cloud**: AWS, GCP and HPC environments, OpenStack, SLURM and Docker.
- **Data Analysis & Visualization**: ggplot2, Plotly, Cytoscape, echarts, d3, leaflet, etc.
- **Machine Learning & Modeling**: Regression, feature selection, classification.
- **LLM and application development**: LLM based applications and knowledge graphs using Neo4j, LangChain.
- **Workflow Management**: Git, GitHub, Markdown, Quarto, Jupyter, and Nextflow.

EXPERIENCES

Aug 2022 – present

PhD Student, The University of Alabama at Birmingham (UAB), Birmingham, AL
- Developed and deployed 4 R Shiny applications on our campus infrastructure.
- Developing pipelines and tools for WES and scRNA-seq data integration.

Jan 2025 – present

Business Development Intern, Bill L. Harbert Institute for Innovation and Entrepreneurship (HIIE), UAB
- Assisting director to manage Innovate Fellow program.
- Supporting initiatives to enhance efficiency and productivity.

Dec 2023 – Dec 2024

Innovate Fellow, Bill L. Harbert Institute for Innovation and Entrepreneurship, UAB
- Conducted scientific and market research for 12 UAB technologies.
- Asses commercial viability and preparing technology marketing materials.

Feb 2021 – Jan 2023

Chief Technical Officer, FundU Games Private Ltd., Delhi, India
- Led 8-person team overseeing full-stack development using React, Node.js, R Shiny, MongoDB and Docker for scalable deployment.
- Managed company's AWS infrastructure, securing initial funding.

Jun 2021 – Aug 2022

Bioinformatics Engineer, STEM-Away, USA
- Developed Bioinformatics and Data Science course materials.
- Mentored summer internship students and developed bioinformatics templates.
- Led a diverse international team of 40 to develop and deliver the app in 8 weeks.

EDUCATION

Aug 2022 – Present

Doctor of Philosophy (Biomedical Engineering and Bioinformatics)
The University of Alabama at Birmingham (UAB), Birmingham, AL, USA

Aug 2023 – Aug 2024

Certificate in Translation of Biomedical Innovation to Clinical Practice
The University of Alabama at Birmingham (UAB), Birmingham, AL, USA

Aug 2017 – Jul 2021

Bachelor of Technology (Bioinformatics)
Amity University, Noida, India

PROFESSIONAL CERTIFICATIONS

Jan 2024 – present

Certified Instructor, The Carpentries

PROJECTS

[1] SEAS **(Statistical Enrichment Analysis of Samples)**
- Developed an R Shiny tool for clinical feature enrichment and prediction (e.g., glioblastoma multiforme).
- Implemented interactive visualizations (density, survival, and distribution plots) and linear modeling.

[2] sMAP **(Standard Microarray Analysis Pipeline App)**:
- Enabled non-coding users to perform QC, differential expression, and biomarker discovery for transcriptomics data analysis.

[3] BioDivPortal
- Built an R Shiny app to map and visualize species occurrences in Poland.
- Used Leaflet for geospatial mapping and dygraphs for time-series data exploration.

[4] PAGER 3.0
- Enhanced a comprehensive gene-set/pathway database with D3–based network and Plotly visualizations.

[5] PAGER WEB APP
- Developed R Shiny application for pathway enrichment and annotation for single-cell and bulk omics data.

[6] GlucoKinaseDB
- Created full-stack solutions (HTML, PHP, JavaScript, MySQL) for peptide and small-molecule databases.
- Integrated 3Dmol.js for structural visualization and developed API endpoints for data access in R/Python.

[7] PepEngine
- Created full-stack solutions (HTML, PHP, JavaScript, MySQL) for peptide and small-molecule databases.

[8] VIRdb 2.0
- Developed vitiligo database, added gene-gene network visualizations using d3 library.

[9] PluriMetNet
- Developed genome-scale metabolic model of human embryonic stem cells.

Additional Tools (In Development)

[10] scRNA-seq Integration App: Shiny-based platform combining nf-core outputs with Seurat, CellChat, and pseudobulk.
[11] R Shiny Template: Reusable starter kit for rapid bioinformatics app development.
[12] Peacock: R package for streamlined project initialization and workflow management.
[13] LLM in R-Shiny: Modular chatbot functionality using OpenAI APIs for interactive analysis.
[14] Thyroid Cancer Explorer: Interactive oncoplot and distribution visualizations for WES/bulk RNA-seq datasets.

PUBLICATIONS

- https://orcid.org/0000-0003-4190-7058 (8)

OUTREACH AND TEACHING EXPERIENCE

Jul 9 – 10, 2024	**Helper**, Data Science workshop on "Bulk RNA-seq", UAB-Biological Data Science Core (U-BDS), UAB
Mar 18 – 19, 2024	**Instructor**, Carpentries workshop on "Bash Shell, Git, Text Editor, and Python", UAB-Biological Data Science Core (U-BDS), UAB
Dec 14 – 15, 2023	**Instructor**, Carpentries workshop on "Bash Shell, Git, Text Editor, R and R Packages", UAB-Biological Data Science Core (U-BDS), UAB
Nov 23, 2021	**Mentor**, STEM-AWAY: "**Deployment of R Shiny Bioinformatics App on AWS**"
	Delivered a talk on containerized bioinformatics and deployment using AWS followed by a live demo on launching and connecting to an EC2 instance, and docker deployment.

LEADERSHIP AND VOLUNTEER EXPERIENCE

Apr 2023 – Jan 2025	**President**, Informatics Club, UAB, AL, USA
2022 – Mar 2023	**Board Member,** Informatics Club, UAB, AL, USA
Aug 2017 – 2021	**Class Representative**, AIB, Amity University, Noida, India