Pritam Kumar Panda

Bioinformatics · Drug Designing · Biophysics · Next Generation Sequencing · Multiomics · Big Data Management

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Summary

Detail-oriented planning, project management, agile architecture, workload prioritization, adherence to development standards, workflow management, and verbal communication form integral components of my critical thinking, process analysis and problem-solving approach. Enriching expertise as a Bioinformatician, the focal point remains on advancing high-throughput data analysis that significantly contribute to solve the puzzle-like nature of coding genomics problems, with a particular emphasis on cancer. Additionally, I specialize in drug designing methodologies and integrate biophysics methods to broaden the scope of inquiry, providing valuable insights into intricate biological phenomena, while leveraging programming languages R, Python and bash scripting to effectively interpret biological data.

Technical Expertise

Biophysics: Molecular Dynamics simulation (GROMACS, CHARMM-GUI), Molecular Docking (Autodock, Vina), Molecular Modeling (AlphaFold2, Modeller), Visualization (ChimeraX, Schrödinger, Maestro, Pymol, DS Visualizer)

Genomics: NGS Analysis(bwa-mem, GATK, IGV-reports, VCFtools, VEP, snpEff, ANNOVAR), RNASeq (DESeq2, STAR, Salmon, kallisto, HISAT2), scRNAseq (Seurat, scanpy, 10X Genomics Cell Ranger), Proteomics (Flow Cytometry analysis, CytoExploreR, LFQ, Ingenuity Pathway Analysis)

Data Science: Dataset management (>20Gb), Machine Learning, Matplotlib, Seaborn, AWS, High Performance Cluster Computing, Software Development

Statistics: Multimodal analysis, ANOVA, Multivariate analysis, PCA, UMAP, tSNE, Origin

Quantum Physics: VASP, Siesta, TranSiesta Electronic Transport, 2D Materials Modeling

Soft Skills: Project management, Documentatation/SOP, Public Speaking and Communication, Leadership, Multi-disciplinary Collaboration, Adaptive problem solving, Multi-tasking, Time Management, Technical Design, Self-Motivated, Strategic Planning, Critical Thinking, Teamwork

Programming Skills

R Python Bash Git CI/CD

nf-core nextflow Singularity docker snakemake

Biorender VSCode IntelliJ Gradle Illustrator

Experience

Bioinformatician — **Heidelberg, Germany**

German Cancer Research Center DKFZ — April 2024 - Present

- Developed and implemented automated NGS analysis pipelines (scRNAseq, RNAseq, Whole Exome/Genome sequencing) using Nextflow, Docker, and Singularity, resulting in a 40% reduction in processing time. Ensured code integrity and consistent pipeline versions through GitLab and GitHub CI/CD pipelines.
- Maintained clear Standard Operating Procedures (SOPs) to achieve full traceability of bioinformatics workflows, ensuring reproducibility and knowledge transfer. Actively contributed expertise to project teams, adopting agile practices and ensuring scientific validity of software products.
- Designed robust pipelines in Nextflow and became a recognized Nextflow ambassador, leveraging expertise to advocate for best practices and innovations in pipeline development.

Data Manager — **Heidelberg, Germany**

German Cancer Research Center DKFZ — July 2023 - April 2024

- Directed diverse teams of researchers, scientists, and clients in managing and executing large-scale big data projects, overseeing project setup, data transfer, and workflow implementation.

- Proficiently utilized One Touch Pipeline (OTP) database developed by DKFZ Omics IT department to establish and optimize workflows for Whole Exome Sequencing (WES), Whole Genome Sequencing (WGS), RNAseq, and single-cell RNA sequencing (scRNAseq) projects.
- Facilitated expert support to clients by addressing inquiries, troubleshooting issues, and delivering effective solutions, ensuring seamless project progression and client satisfaction.

Bioinformatics Engineer | Project Lead — **Mainz, Germany**
HI-TRON Mainz — July 2023 - Present

- Spearheaded the development and implementation of the data architecture platform "HI-TRON data portal" backend, utilizing MOLGENIS database technolog and led the team through the entire development lifecycle.
- Collected metadata to facilitate the design of the portal and ensure comprehensive data representation and searchability.
- Utilized strategic decisions to adopt the FAIR scientific practice, for the development of the data catalogue.
- Strategically provided input to the front-end design and functionalities for the portal enhancing user experience and accessibility.

Affiliated Researcher — **Stockholm, Sweden**
Karolinska Institute — March 2021 - March 2023

- Curated and analyzed complex clinical data, including but not limited to genomic data, and antibody clones from patient samples, and develop novel predictive models using statistical techniques and machine learning to support patient stratification and biomarker selection in clinical trials.
- Assisted in developing Immunoinformatics pipeline for modeling in-house antibody clones and established pipelines for antibody profiling and simulation to understand the Immunomodulatory effects in cardiovascular-related disorders.
- Designed exploratory data analysis pipeline using machine learning models for clinical data cohorts and developed analysis frameworks to improve visualization, integration, and accessibility of complex clinical data.

Ph.D. Researcher — **Uppsala, Sweden**
Uppsala University — November 2018 - March 2023

- Developed a multi-scale modeling pipeline using molecular dynamics simulation on protein, nanomaterials, complex, and membrane models using shell scripting.
- Established a link between the quantum and biological behavior of bio-inspired materials to understand the interface chemistry with a focus on 2D materials modeling.
- Initiated, designed, and led sub-projects to develop protocols on ab-inito quantum methods using electronic transport models for DNA/Protein nanopore sequencing and Gas sensing mechanisms.

NGS Data Analyst — **Freiburg im Breisgau, Germany**
University Medical Center, University of Freiburg — September 2017 -October 2018

- Developed and validated whole exome sequencing (WES) and NEBNext Direct clinical cancer hotspot panel pipelines for clinical diagnostics, focusing on Myelodysplastic syndromes variants with annotations.
- Designed computing strategy in a High-Performance Computing (HPC) environment, optimizing algorithm development processes.
- Spearheaded collaborative research project to design and analyze gene-expression data using RNA-seq pipeline, contributing to improved performance and a Nature Medicine article.

Computational Biologist — **Bhubaneswar, India**
KIIT University — July 2016 - August 2017

- Formulated nano-bioinformatics methods for metal & covalent-based docking and applied innovative computational techniques to model interactions between nanoparticles and biological molecules in zebrafish models. Developed metagenomics pipeline to elucidate the microbial landscape and its role in virulence.
- Engaged in collaborative research projects, leveraging interdisciplinary approaches to address complex biological questions resulted in high-impact publications.

Leadership and Outreach

Bioinformatics Consultant — **Piscataway-NJ, USA**
Colgate and Palmolive — November 2021 - June 2023 (Contract)

- Collaborated on the development of a pipeline for combinatorial synergy-based drug design targeting photoaging and hyperpigmentation.This collaborative effort resulted in the publication of an article highlighting the innovative approach and findings.
- Research initiatives in drug discovery, demonstrating proficiency in CADD methodologies and techniques.

International Faculty Associate — **Bhubaneswar, India**
KIIT School of Biotechnology — August 2022 - January 2023 (Contract)

- Taught graduate courses (Masters) in Bioinformatics & Systems Biology.
- Conducted practical sessions in Bioinformatics to familiarise the current trends and concepts.
- Consistently achieved highest reviews from both students and fellow faculty.
- Provided personalized support to students and worked with school faculty members to assess the progress of students.
- Collaborate directly with faculty and staff in the design, development, and management of online courses and learning experiences, online course partnerships, hybrid and flexible course design, and non-credit design and development projects.

Scientific Advisor — **Helsinki, Finland**
LongHack sponsored by VitaDAO — June 2021 - June 2023 (Contract)

- Engaged in guiding and supporting participants throughout the hackathon process, ensuring their understanding and addressing their needs effectively.
- Spearheaded the organization of two successful hackathons focused on longevity, demonstrating effective leadership and project management skills.
- Contributed to identifying potential customers and expanding networks through the hackathon platform, fostering valuable connections within the scientific and entrepreneurial communities.

General Clinical Consultant — **Cambridge, Massachusetts**
Breath of Health — November 2021 - January 2023 (Contract)

- Grant Proposal Assistance: Proficient in providing support in framing grant proposals, conducting clinical data analysis, and performing bioinformatics data analysis, contributing to successful funding acquisition and research initiatives.
- Machine Learning Development: Experienced in developing machine learning models and pipelines specifically tailored for next-generation sequencing (NGS) data analysis and automation, optimizing workflows for efficiency and accuracy in genomic research.

Founder and CEO — **Uppsala, Sweden**
Nerdalytics — December 2021 - July 2023

- Founded a project management startup specializing in bioinformatics consultancy for pharmaceutical industries, aligning services with industry demands.
- Adapted company policies, regulations, and financial strategies for effective management of multiple projects, ensuring project viability and sustainability.
- Led the budgeting, coordination, and development of confidential projects with pharmaceutical companies, focusing on defining project scope, cost estimation, and key deliverables

Scientific Advisor and Bioinformatician — **Stockholm, Sweden**
Inflanova AB — August 2021 - March 2023 (Contract)

- Played a pivotal role in identifying potential clients within industrial sectors interested in vaccine formulation.
- Leveraged market research and networking skills to establish connections and initiate discussions with prospective partners.
- Filed a patent **WO2023217787** for a clinical vaccine candidate designed for anti-viral therapy.
- Employed multiomics and bioinformatics approaches to develop innovative strategies for vaccine design and therapeutic intervention.

Selected Publications

Please refer to my **Google Scholar** for a full publications list.

- Sahoo, S. S. ; Pastor, V. B. ; Goodings, C. ; Voss, R. K. ; Kozyra, E. J. ; Szvetnik, A. ; Noellke, P. ; Dworzak, M. ; Stary, J. ; Locatelli, F. ; Panda, P. K. ; others. Clinical Evolution, Genetic Landscape and Trajectories of Clonal Hematopoiesis in Samd9/samd9l Syndromes (Vol 27, Pg 1806, 2021). **Nature Medicine** 2021, 27 (12), 2248–2249 **[IF=87.241]**
- Panda, P. K. ; Arul, M. N. ; Patel, P. ; Verma, S. K. ; Luo, W. ; Rubahn, H.-G. ; Mishra, Y. K. ; Suar, M. ; Ahuja, R. Structure-Based Drug Designing and Immunoinformatics Approach for SARS-Cov-2. **Science advances (AAAS)** 2020, 6 (28), eabb8097 **[IF=13.116]**
- Sahoo, S. S. ; Loyola, V. P. ; Panda, P. K. ; Szvetnik, E. A. ; Kozyra, E. J. ; Voss, R. K. ; Lebrecht, D. ; Barzilai, S. ; Büchner, J. ; Catala, A. ; others. Samd9 and Samd9l Germline Disorders in Patients Enrolled in Studies of the European Working Group of MDS in Childhood (EWOG-MDS): Prevalence, Outcome, Phenotype and Functional Characterisation. **Blood** 2018, 132, 643–644 **[IF=22.113]**

- Krombholz, C. F. ; Gallego-Villar, L. ; Sahoo, S. S. ; Panda, P. K. ; Wlodarski, M. W. ; Aumann, K. ; Hartmann, M. ; Lipka, D. B. ; Daskalakis, M. ; Plass, C. ; others. Azacitidine Is Effective for Targeting Leukemia-Initiating Cells in Juvenile Myelomonocytic Leukemia. **Nature Leukemia** 2019, 33 (7), 1805–1810 **[IF=11.4]**
- Loyola, V. P. ; Panda, P. K. ; Sahoo, S. S. ; Szvetnik, E. A. ; Kozyra, E. J. ; Voss, R. K. ; Lebrecht, D. ; Wehrle, J. ; Erlacher, M. ; Stary,J. ; others. Monosomy 7 as the Initial Hit Followed by Sequential Acquisition of Setbp1 and Asxl1 Driver Mutations in Childhood Myelodysplastic Syndromes. **Blood** 2018, 132, 105–106 **[IF=22.113]**
- Simnani, F. Z. ; Singh, D. ; Patel, P. ; Choudhury, A. ; Sinha, A. ; Nandi, A. ; Samal, S. K. ; Verma, S. K. ; Panda, P. K. Nanocarrier Vaccine Therapeutics for Global Infectious and Chronic Diseases. **Materials Today** 2023, 66. 371-408 **[IF=31.041]**
- Panda, P. K. ; Kumari, P. ; Patel, P. ; Samal, S. K. ; Mishra, S. ; Tambuwala, M. M. ; Dutt, A. ; Hilscherova, K. ; Mishra, Y. K. ; Varma, R. S. ; others. Molecular Nanoinformatics Approach Assessing the Biocompatibility of Biogenic Silver Nanoparticles with Channelized Intrinsic Steatosis and Apoptosis. **Green Chemistry** 2021 **[IF=11.034]**

Key Acheivements/Recognitions

- Appointed as **Nextflow Ambassador** by Nextflow (Seqera) and nf-core community.
- Reviewed more than 30 proposals for Biotechnology Industry Research Assistance Council (BIRAC).
- Research grant from Colgate & Palmolive to conduct computer-aided drug design (CADD) studies.
- Acknowledged by Elsevier and Springer for outstanding contributions as a reviewer.
- Two times Chairperson at the e-Materials Research Society conference.
- Received IMM Strategic Interdisciplinary Collaboration Grant at Karolinks Institute.
- Awarded AIMday materials 2020 grant (Uppsala University innovation grant) by ABB Power Grids, Hitachi, Sweden.
- Invited as a guest for exclusive one-on-one conversations by leading **TV news** channels in India.
- Featured in The **The Global Indian** for featuring my journey in its exclusive series 'Indians in Europe.

Teaching and Mentorships

- Instructed Master's level courses at KIIT University, India, crafted comprehensive lesson plans, delivered engaging lectures, and conducted interactive discussions to enrich student comprehension of the curriculum.
- Organized lectures, workshops, and team-building activities while teaching graduate courses in Bioinformatics & Systems Biology, earning top reviews.
- Successfully led a diverse team of 160 researchers from 10 countries to organize a longevity hackathon, demonstrating strong leadership and management skills.
- Took initiative to start a hands-on training YouTube channel covering NGS, computer-aided drug design, quantum chemistry methods, molecular dynamics, and bioinformatics lectures.

Certifications

Stanford Online:	Machine Learning Specialization, Supervised Machine Learning, Advanced Learning Algorithms, Unsupervised/Reinforcement Learning, Recommenders
Coursera:	Google Data Analytics
Amazon:	AWS Technical Essentials
QIAGEN:	QIAGEN Ingenuity Pathway Analysis
Udemy:	Designing nano devices and sensors, 100 Days of Code:The Complete Python Pro Bootcamp
Six Sigma:	Six Sigma Green Belt by International Six Sigma Institute
EMBL-EBI/GHGA:	Nextflow, nf-core hackathon, RNAseq, scRNASeq
DKFZ:	Cyber Security, Good Scientific Practices, Prevention of Corruption, DIN EN ISO 15189:2023 (German Accreditation Body (DAkkS), Medical Laboratories Quality and Competence

Education

Ph.D. in Physics (Specialization in Atomic, Molecular and Condensed Matter Physics) — **Uppsala, Sweden**
Uppsala University — 2018 - 2023

Master of Technology in Bioinformatics — **Mumbai, India**
D Y Patil University — 2014 - 2016

Master of Science in Bioinformatics — **Bhubaneswar, India**
Utkal University — 2012 - 2014

Bachelor of Science in Bioinformatics — **Bhubaneswar, India**
Utkal University — 2009 - 2012

Hobbies/Interests

- Enthusiastic PC gamer, dedicated to playing first-hand games.
- Created and maintained a YouTube channel to share tutorials and insights on various topics, contributing to knowledge dissemination and community engagement.
- Pursue scientific art as a hobby, specializing in creating schematics and illustrations to visually represent complex scientific concepts and ideas. Additionally, write engaging posts on LinkedIn to foster discussions and build connections within the professional community.
- Passionate about interior designing, consistently exploring new trends, concepts, and techniques to create aesthetically pleasing and functional spaces.

References

1. **Prof. Dr. Yogendra Kumar Mishra**, FRSC,
Head of Smart Materials,
Mads Clausen Institute, NanoSYD,
University of Southern Denmark
mishra@mci.sdu.dk

2. **Dr. Vinay Bhardwaj**, Scientific Director
SGS North America
Rutherford, New Jersey
United States
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3. **Dr. Bikash Ranjan Sahoo**, Research Specialist
HHMI-Howard Hughes Medical Institute,
Molecular, Cellular and Developmental Biology,
University of Michigan, Ann Arbor, MI 48108, USA
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4. **Dr. Suresh K. Verma**, Assistant Professor
Department of Toxicology,
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Visit my website: https://bioinfocopilot.tilda.ws
Google Scholar: https://scholar.google.com/citations?user=H2ggrzQAAAAJ&hl=en
ResearchGate: https://www.researchgate.net/profile/Pritam-Panda-2
Web of Science: https://www.webofscience.com/wos/author/record/E-8002-2015