DINESH SHARMA

Ph.D. Scholar, Supercomputing Facility for Bioinformatics & Computational Biology (SCFBio), Kusuma School of Biological Sciences (KSBS), Indian Institute of Technology (IIT) Delhi, New Delhi 110016, India.

Website: https://web.iitd.ac.in/~blz198642/ | **LinkedIn**: https://www.linkedin.com/in/dinesh-sharma-0b8158140/ | **Email**: run478@gmail.com;dinesh.sharma@bioschool.iitd.ac.in | **Phone**: +91-7042143919 | **GitHub**: https://github.com/rnsharma478

EDUCATION/ACADEMIC TRAINING

Indian Institute of Technology (IIT) Delhi, New Delhi, India *December 2019 – Present*
Ph.D. Bioinformatics/Computational Genomics *CGPA: 9.54 (Coursework)*
Advisor: Prof. B Jayaram and Prof. Aditya Mittal

Jamia Millia Islamia, New Delhi, India *July 2017 – May 2019*
MSc. Bioinformatics *CGPA*: 9.66

Acharya Narendra Dev College (ANDC), Delhi University (DU), New Delhi, India *July 2014 – May 2017*
BSc. (Honors) Biomedical Sciences Percentage: 84.42
Certificate course in Bioinformatics and In-silico Drug Discovery

PUBLICATIONS

- **Biophysical Signatures as Markers for Differentiation of Diverse Genomic Elements across Eukaryotic Kingdoms**
  Dinesh Sharma, Danish Aslam, Aditya Mittal, and B. Jayaram
  September 2024, In Review at *BMC Genomics*.

- **Exon-Intron Boundary Detection Made Easy by Physicochemical Properties of DNA**
  Dinesh Sharma**,** Danish Aslam, Kopal Sharma, Aditya Mittal, and B. Jayaram
  May 2024, Preprint DOI: https://doi.org/10.21203/rs.3.rs-4359229/v1 and In Review at *Molecular Omics (Royal Society of Chemistry)*.

- **Molecular dynamics simulation-based trinucleotide and tetranucleotide level structural and energy characterization of the functional units of genomic DNA**
  Dinesh Sharma**,** Kopal Sharma, Akhilesh Mishra, Priyanka Siwach, Aditya Mittal, and B. Jayaram.
  February 2023, DOI: https://doi.org/10.1039/D2CP04820E *Physical Chemistry Chemical Physics, Royal Society of Chemistry*.

HONORS AND AWARDS

- **DST-SERB travel award** (covering travel and registration costs) to attend the "Biological Data Science 2024" at Cold Spring Harbor Laboratory (CSHL), New York, USA.
- **Indo-French Student Mobility Scholarship** (4300 Euros), Sorbonne University, Paris, France (October 2023).
- **Council of Scientific & Industrial Research (CSIR)** Senior Research Fellowship, India (January 2022).
- **Council of Scientific & Industrial Research (CSIR)** Junior Research Fellowship – National Eligibility Test (All India Rank 54 CSIR June 2018), India (December 2019).
- **Gold Medalist** (University 1st Rank in MSc. Bioinformatics), Jamia Millia Islamia (May 2019).
- **Studentship** (INR 10,000 per month for six months), Department of Biotechnology (DBT) – Bioinformatics Infrastructure (BIF) Jamia Millia Islamia (January 2019).
- **INSA-NASI-IAS (Indian National Science Academy-National Academy of Science India-Indian Academy of Science) Summer Research Fellowship** (June 2016).
- **Delhi University (DU)-Innovation Projects** Student (January 2015).
- **Army Wives Welfare Association (AWWA) Scholarship.**

WORK EXPERIENCES

- **Ph.D. Scholar**, Indian Institute of Technology (IIT) Delhi, New Delhi, India (December 2019 – Present).
  Ph.D. Research Topic: ***Genome Annotation in Eukaryotes*.**
  Advisor: Prof. B Jayaram & Prof. Aditya Mittal, SCFBio, Kusuma School of Biological Sciences, IIT Delhi.

  Working as a senior computational biologist in the genomics group at Supercomputing Facility for Bioinformatics and Computational Biology (SCFBio), IIT Delhi. The broad area of my work is eukaryotic genome annotation. I am working on the structural and energetic parameters of DNA and integrating Machine Learning and Deep Learning models to develop and optimize several genome annotation tools from the laboratory.

- **Exchange Student**, Institute of Biology Paris-Seine (IBPS), Sorbonne University, Paris, France (October 2023 – January 2024).
  Project Title: ***tRNA fragments (tRFs) analysis.***
  Advisor: Prof. Clément Carré, TErBio (Transgenerational Epigenetics & small RNA biology) laboratory, IBPS, Sorbonne University, Paris, France.

  Developed a comprehensive bioinformatics pipeline to analyze and quantify differential expression of tRNA fragments in biological samples. The project utilized a combination of Python, Bash, and R languages to efficiently process and analyze large-scale sequencing data. The pipeline's design allowed for accurate measurement of expression variations, providing valuable insights into the regulatory roles of tRNA fragments in biological processes.

- **Masters' Thesis,** Jamia Millia Islamia, New Delhi, India (January 2019 – June 2019).
  Project Title: ***Differentiation of Hepatic Images into Cancerous and Non-Cancerous using Optimised K-Nearest Neighbour Algorithm*.**
  Advisor: Prof. Rafat Parveen, Department of Computer Sciences, Jamia Millia Islamia, New Delhi, India.

  This work aims to develop an early predictor/classifier for liver MRI images to distinguish cancerous and non-cancerous images based on extracted features and patterns. The classification algorithm, K-nearest neighbor (KNN), was modified by incorporating Particle Swarm Optimization (PSO) to identify optimal K-values. The project involved image fragmentation and processing in MATLAB. The project aimed to create and construct cost-effective and accurate hepatic cancer diagnosis models.

- **Summer Research Project**, Indian Institute of Chemical Biology (IICB), Kolkata, India (June 2016 – August 2016).
  Project Title: ***Generation of Liposomal Recombinant Antigens for Vaccination against Visceral Leishmaniasis*.**
  Advisor: Prof. Nahid Ali, Indian Institute of Chemical Biology (IICB), Kolkata, India.

- **Delhi University (DU)-Innovation Project**, Acharya Narendra Dev College (ANDC), DU, New Delhi, India (2015-2016).
  Project Title: ***Leveraging big data for astronomy and health care.***

TEACHING AND OTHER ROLES

- **Speaker/Resource Person for NGS Analysis/Genome Annotation** at Department of Science & Technology (DST) - Science and Engineering Research Board (SERB) Sponsored **"Bioinformatics Workshop for Genomics and Proteomic Analysis 2024"** at Dev Bhoomi Uttarakhand University (DBUU), Dehradun, India.
- **Invited Subject area Expert/Trainer** for the Computational Genomics Track at Computer-Aided Drug Design and Structural Bioinformatics (CADDSB-2023) at Indian Institute of Technology (IIT)-BHU, Varanasi, India.
- **Teaching Assistant,** Indian Institute of Technology (IIT) Delhi, New Delhi, India (April 2021 – April 2023)
  Took charge of practical classes and skillfully guided and mentored Undergraduate students (B. Tech) from diverse streams, providing them with hands-on learning opportunities in Biology techniques.
- **Guest lecturer**, Netaji Subhas University of Technology, New Delhi, India (August 2022 – December 2022)
  With expertise in Python programming, I was engaged in theoretical and practical classes for Postgraduate (M. Tech) Bioinformatics Students, equipping students with essential programming tools and skills relevant to Bioinformatics.
- **Organizer and Student Representative** for the 9th Department of Biotechnology (DBT) - Bioinformatics Infrastructure (BIF) Sponsored National Workshop on **"Translational Bioinformatics: Guinness Book Recording to Digital Era 2018"** at Jamia Millia Islamia.

- **Class Representative**, MSc. Bioinformatics, Jamia Millia Islamia (2017-2019).
- **Class Representative**, BSc. (Honors) Biomedical Sciences, Delhi University (2015-2016).

TALKS AND CONFERENCES

- **BioWorld 2024 conference at Naukuchiyatal, Nainital, Uttarakhand. Delivered a talk entitled "Unveiling DNA's Biophysical Signatures: From Structure and Function to Genome Annotation".**
- **CSHL "Biological Data Science 2024" (Nov 13 to Nov 16, 2024) at Cold Spring Harbor, New York, USA. Presented a poster entitled "A Novel Physicochemical Property-Based Exon-Intron Boundary Prediction Method".**
- Research Scholar Forum, IIT Delhi workshop on Effective Research Writing, February 2024.
- **RNA, on the Road agaiN Again, Sorbonne University, Paris, France, December 2023.**
- **DST-SERB sponsored workshop on "Bioinformatics and statistical analysis of genome-scale DNA and RNA sequencing data to understand human diseases" 2023 at the National Institute of Biomedical Genomics (NIBMG), Kolkata, India.**
- **Genomics India conference on 2nd & 3rd Feb 2023 at NIMHANS Convention Center, Bengaluru, India. Presented Poster entitled "Physicochemical characterization of promoters using Molecular Dynamics simulation-based parameters".**
- Computer-Aided Drug Design and Structural Bioinformatics (CADDSB-2023) March 13-17, 2023, IIT (BHU), Varanasi, India.
- **Bioconductor Annual Conference (online) 2021.**
- Summer School on Machine Learning in Bioinformatics 2021 (online) organized by HSE University, Russia.
- Workshop On "Omics Data Analysis" organized by the Department of Biotechnology, Jaypee Institute of Information Technology, Noida, from April 16-17, 2021.
- Participated in the "Copenhagen Biohackathon 2021" (protein edition) and worked on "Structural basis for solubility in protein expression systems" from April 23-25, 2021.
- **ENSEMBL Browser and Rest API online course organized by EMBL-EBI, 17-20 Nov 2020.**
- "International Conference on Data Science in Biology (ICDSB) 2020" the Institute of Bioinformatics and IIT Jodhpur organized on Sept 3-5 and 8, 2020.

STUDENTS MENTORED

- Arushi Gupta, MSc. Bioinformatics, Amity University, Noida, Uttar Pradesh, India.
- Aman Gondane, M. Tech Molecular Engineering, IIT Delhi, New Delhi, India.
- Danish Aslam, MSc. Bioinformatics, Jamia Millia Islamia, New Delhi, India.
- Kopal Sharma, B. Tech Data Science, Narsee Monjee Institute of Management Studies (NMIMS), Mumbai, Maharashtra, India.
- Arsh Saiyad, B. Tech, DBEB, IIT Delhi, New Delhi, India.
- Prashita Saxena, B. Tech, DBEB, IIT Delhi, New Delhi, India.
- Sanaz Agarwal, B. Tech, DBEB, IIT Delhi, New Delhi, India.

SELECTED SKILLS

COMPUTATIONAL**:* Windows, Linux, High Performance Computing (HPC), Docker, Git, Python, R, C++, BASH Scripting, Perl, MATLAB, SQL etc. | ***PACKAGES: Numpy, Pandas, Scikit-learn, Matplotlib, Tensorflow, Bioconductor, Biopython, ggplot, etc. | ***SUBJECT:*** Genetics & Genomics, Molecular & Cell Biology, Human Physiology and Pathology, Biotechnology, Biochemistry, Machine learning, Pharmacology, Toxicology, Medicinal Chemistry, Bioinformatics, etc. | ***LAB TECHNIQUES*:** SDS-PAGE, Western Blotting, PCR, AGE, etc.

Hobbies/Interests: Hiking, Biking, Badminton, Table Tennis, etc.

REFERENCES

- Prof. B Jayaram, SCFBio, Kusuma School of Biological Sciences, IIT Delhi, New Delhi, India.
- Prof. Aditya Mittal, SCFBio, Kusuma School of Biological Sciences, IIT Delhi, New Delhi, India.
- Prof. Clément Carré, TErBio laboratory, IBPS, Sorbonne University, Paris, France.
- Prof. Rafat Parveen, Department of Computer Science, Jamia Millia Islamia, New Delhi, India.