Debarka Sengupta dob: 29/11/1983

Inst. Chair, FNASc., Humboldt Fellow

Assoc. Prof., Depts. Of Comp. Bio. and Comp. Sc. & Engg.

Head, Infosys Centre for AI

A306, R&D Block, Indraprastha Institute of Information Technology - Delhi

Okhla Phase 3, Delhi 110020

✉ debarka@iitd.ac.in

🔗 https://thesenguptalab.com/

Executive Summary

- **Publications:** Journal publications: 53; Review: 2; Conference proceedings: 7; Book chapters: 1; Patents: 5 (Applied: 4; Granted: 1); Citations: 2821; H-index: 23; i10-index: 37
- **Notable Awards and Honors:** Humboldt Fellowship (Experienced Researcher); Institute Chair Professorship; FNASc.; INAE young innovator and entrepreneur; Merck Young Scientist Award; Adjunct Prof., Queensland University of Technology - Brisbane; INSPIRE Faculty
- **ONE** technology transfer, **THREE** startups as founder/partner
- **Open-source software developed**: 20+
- **Editor** on the boards of FOUR international journals
- **Theses supervised (completed):** Ph.D. (9); Master's (16)
- **Leadership:** Head, Infosys Centre for AI, IIIT-D; Associate Dean, IRD

Education

Genome Institute of Singapore (GIS), SINGAPORE:
Postdoctoral Fellow 2013 – 2016

Indian Statistical Institute, Kolkata, INDIA:
Ph.D. in Computer Science and Engineering 2009 – 2013
Research Areas: Machine Learning, Data Mining, Computational Biology
(Degree awarded in 2014 by Jadavpur University, Kolkata, INDIA)

Meghnad Saha Institute of Technology, WBUT, Kolkata, INDIA:
B.Tech. in Computer Science and Engineering 2002 – 2006

Academic Positions

Assoc. Dean (Innovation, Research & Development) 2024 – present
Institute Chair Position 2023 – present
Head, Infosys Centre for Artificial Intelligence 2022 – present

Associate Professor, Depts. of CB and CSE, 2020 – present
Assistant Professor, Depts. of CB and CSE, 2017 – 2020
Indraprastha Institute of Information Technology, Delhi, INDIA.

Dr. Sengupta is jointly affiliated with the Depts. of Computational Biology and Computer Science. At IIIT-D, he led India's first research program in single cell genomics. His laboratory introduced big data algorithms to speed up the analysis of large scale single cell omics data. As a scientific co-founder at multiple technology startups Dr. Sengupta developed and commercialized numerous technologies. He is the current head of the Infosys Center for Artificial Intelligence, which is at the forefront of AI research in India.

Adj. Professor, 2023 – Present
Adj. Associate Professor, 2020 – 2023
Queensland University of Technology, Brisbane, AUSTRALIA.

Dr. Sengupta was inducted to this honorary position for conducting joint research in the areas of precision oncology.

INSPIRE Faculty, 2016 – 2017
Machine Intelligence Unit, Indian Statistical Institute, Kolkata, INDIA.

Dr. Sengupta received the INSPIRE Faculty Award (DST, Govt. of India) in 2014 (not activated), and 2015. He started his independent laboratory at the Indian Statistical Institute, Kolkata and continued for a brief time before he took a tenure track position at IIIT-D. During this short stint his research focused on developing fast algorithms for single cell data analysis.

Industrial Positions

Cofounder & Chief, Science, 2024 – present
GeneSilico.ai, INDIA & USA.

Developing cutting edge precision oncology solutions for breast cancer patients (link: GeneSilico).

Scientific Cofounder, 2021 – present
d.kraft Pte. Ltd., SINGAPORE.

Dr. Sengupta leads the data science team, working towards developing an AI-based conversational Learning Management System (LMS). He led the R&D team to develop Qz.kraft, an AI powered SaaS solution for automated quiz generation, conduct and evaluation(link: https://www.qzkraft.com/).

Chief Scientific Advisor, 2021 – present
CareOnco Biotech Pvt. Ltd., Delhi, INDIA.

Dr. Sengupta's team applied an ensemble of feature selection techniques to synthesize a 11 platelet gene panel which detects early onset of cancer with 97% accuracy, using state of the art classification algorithms. The panel has been experimentally validated at AIIMS-Delhi on NSCLC patients *(Goswami et al., BMC Genomics 2020)*. Dr. Sengupta transferred the technology to CareOnco Biotech Pvt. Ltd., where he serves as the Chief Scientific Advisor and a partner. This is an indigenously developed liquid biopsy assay *(Indian patent application no. 202011042049)*, currently undergoing large scale clinical validation under the commercial name TEPScan™ (250 + patients across India and Norway). For this work, Dr. Sengupta received the *2022*

INAE Young Innovator & Entrepreneur Award.

Consultant (Head, Data Sciences), 2018 – 2019
Circle of Life Healthcare Pvt. Ltd., Delhi, INDIA.

As consultant Dr. Sengupta led a team of data scientists and engineers to develop ZEVAC, a first of its kind SaaS platform to enable and accelerate antimicrobial stewardship. ZEVAC is capable of predicting personalized antibiograms based on widely available clinical, laboratory and demographic information of patients with infection. This has been deployed by major hospital chains in India.

Senior Data Scientist, 2013 – 2013
CoreCompete Pvt. Ltd., Hyderabad, INDIA.

Worked on various data science client projects.

Systems Engineer, 2007 – 2009
IBM India Pvt. Ltd., INDIA.

Contributed in building ERP softwares for major clients such as Amgen, Nestle, and Canadian Pacific Railways.

Software Engineer, 2006 – 2007
Infosys Ltd., INDIA.

As a software engineer Debarka developed SAP based ERP solutions for major clients such as French oil and gas company Air Liquide. He received the 2007 Spot Award by Infosys for his work.

Other Leadership Roles

Faculty in charge, Discovery Track Investigator 2022
Indraprastha Institute of Information Technology, Delhi, INDIA.

Initiated an intramural faculty award to promote basic research in different areas of science, society and technology.

President of Institute Innovation Council 2020 – 2021
Indraprastha Institute of Information Technology, Delhi, INDIA.

As a founding president Dr. Sengupta conducted several programs and workshops to foster the culture of innovation and entrepreneurship in the institute.

Founding Director, PGD in Data Science and AI (in collaboration with IBM) 2020 – 2021
Indraprastha Institute of Information Technology, Delhi, INDIA.

Dr. Sengupta launched the first of its kind PGD in data science and AI, in collaboration with IBM. Two batches successfully graduated during his tenure as a program director. This program helped chart out the policies for launching similar PGD programs, in collaboration with other industry partners.

Technologies Developed/licensed

TEPScan™
CareOnco Biotech Pvt. Ltd., Delhi, INDIA.

Dr. Sengupta's team applied an ensemble of feature selection techniques to synthesize a 11 platelet gene panel which detects early onset of cancer with 97% accuracy, using state of the art classification algorithms. The panel has been experimentally validated at AIIMS-Delhi on NSCLC patients *(Goswami et al., BMC Genomics 2020)*. **Dr. Sengupta transferred the technology to CareOnco Biotech Pvt. Ltd. (valued at INR 40,00,000)**, where he serves as the Chief Scientific Advisor and a partner. This is an indigenously developed liquid biopsy assay *(Indian patent application no. 202011042049)*, currently undergoing large scale clinical validation under the commercial name TEPScanTM (250 + patients across India and Norway). For this work, Dr. Sengupta received the *2022 INAE Young Innovator & Entrepreneur Award*.

Link: https://careoncobiotech.com/TEPscan.html

Qz.kraft
d.kraft Pte. Ltd., SINGAPORE.

Qz.kraft uses large language models to populate questions and answers from a given discourse (book chapter, slides etc.)

Link: https://qzkraft.com/

ZEVAC
Circle of Life Healthcare Pvt. Ltd., Delhi, INDIA.

Dr. Sengupta, as a consultant and the head of data sciences at Circle of Life Healthcare Pvt. Ltd. led the R&D of ZEVAC, an AI based solution that currently serves Antimicrobial Stewardship teams at some of the largest hospitals in Asia (Ghosh et al. medRxiv, 19007153; Sengupta et al. Infection Control & Hospital Epidemiology, 41(S1), s521-s522; Patent application no. 201911030624). ZEVAC uses advanced machine learning to present a personalized proxy antibiogram (culture and sensitivity report) for the patient instantly (at the zero hour) with great accuracy. This helps the treating physician in making informed decisions for infection management (improve empiric therapy protocols) at the time of first contact with the patient rather than having to wait for 48–72 hours for the culture to arrive. At present the solution available in the market is an archaic manual methodology of cumulative (generic population-wide) antibiogram report being generated for use by clinicians. Such a report is neither personalized nor updated at sufficient periodicity to have requisite impact on antibiotic prescription practices. ZEVAC has recently been deployed at major Indian hospitals.

Link:
https://azuremarketplace.microsoft.com/en-us/marketplace/apps/circleoflifehealthcareprivatelimited1594032990874.zevac?tab=overview

Funding

Completed research projects

2016-2021 **Title:** Statistical and computational methods for addressing some unmet challenges in analysis of single cell RNA-seq data; **Role:** PI; **Agency:** DST; **Amount:** INR 35 Lakh

2021-2023 **Title:** Ultrasound placental image texture analysis using artificial intelligence applications to predict hypertension in pregnancy; **Role:** Co-PI; **Agency:** ICMR; **Amount:** INR 24.4 Lakh

Ongoing research projects

2023-2027 **Title:** Recurrence-independent inference of rare and non-coding functional mutations in cancer; **Role:** PI (Indian part); **Agency:** DBT (Indo-Swiss Joint Research Programme); **Amount:** INR 53.4 Lakh

2022-2027 **Title:** Establishment of Bioinformatics Centre for Biomedical Applications; **Role:** Co-PI; **Agency:** DBT; **Amount:** INR 156 Lakh

2023-2028 **Title:** National Network Project of Indraprastha Institute of Information Technology Delhi; **Role:** Co-PI; **Agency:** DBT; **Amount:** INR 197 Lakh

2023-2026 **Title:** RNA velocity independent direction resolved trajectory inference from scRNA-seq data; **Role:** PI; **Agency:** SERB CRG; **Amount:** INR 52.38 Lakh

2022-2024 **Title:** A pretrained model based approach to characterization of functional heterogeneity in cancer; **Role:** PI; **Agency:** TiH - iHub Anubhuti; **Amount:** INR 30 Lakh

Completed industry sponsored projects

2019-2019 **Title:** Price optimization, demand planning and out of stock prediction using deep learning **Role:** PI; **Company:** NextOrbit Platforms and Solutions Pvt. Ltd.; **Amount:** INR 9.6 Lakh

2022-2023 **Title:** Matrix factorisation and deep learning based approaches for time-course monitoring of energy consumption and distribution; **Role:** PI; **Company:** Applied Solar Technology; **Amount:** INR 9.8 Lakh

ongoing industry sponsored projects

2024-Present **Title:** Application of machine learning and large language models for dynamic modeling of sales and marketing opportunities; **Role:** PI; **Company:** Andromeda 360, Inc. dba Banavo.AI; **Amount:** INR 32.4 Lakh **(yearly)**

2023-Present **Title:** ML and DL based solutions for dynamic and adaptive Identity, authentication & risk management; **Role:** PI; **Company:** Precision Group; **Amount:** INR 32.6 Lakh **(yearly)**

2023-Present **Title:** Unlocking growth potential: Data driven performance optimization for teleshopping; **Role:** PI; **Agency:** Vaibhav Global Ltd.; **Amount:** INR 24.9 Lakh **(yearly)**

Postdoctoral Research Supervised

2024-Present: Sreeram Chandra Murthy Peela, Ph.D.
2022-2023: Urvashi Arora, Ph.D.
2023-2023: Prashant Gupta, Ph.D.

Doctoral Theses Supervised

Completed

2016-2019: Debajyoti Sinha, Ph.D., presently a postdoc at the University of Nantes, FRANCE **(co-advisor)**
2017-2021: Krishan Gupta, Ph.D., presently a postdoc at the Harvard Medical School, MA, USA **(advisor)**
2017-2022: Smriti Chawla, Ph.D., presently a postdoc at the Harvard Medical School, MA, USA **(advisor)**
2017-2022: Asif Adil, Ph.D., to join Indiana University, USA **(co-advisor)**
2017-2023: Prashant Gupta, Ph.D., to join Wellcome Sanger Institute, UK as a postdoc **(co-advisor)**
2017-2023: Aashi Jindal, Ph.D., working at Applied Solar Technologies, INDIA **(co-advisor)**
2017-2022: Priyadarshini Rai, Ph.D., presently a postdoc at the University of Pennsylvania, PA, USA **(advisor)**
2017-2023: Sarita Poonia, Ph.D., presently a postdoc at the Cleveland Clinic, OH, USA **(advisor)**
2017-2022: Chitrita Goswami, Ph.D., presently a postdoc at Roche, NY, USA **(advisor)**

Thesis submitted

NA

Ongoing

2020-present: Namrata Bhattacharya **(advisor)**
2022-present: Bernadette Mathew **(advisor)**
2022-present: Sakshi Gujral **(advisor)**
2022-present: Smruti Mayi Panda **(advisor)**
2022-present: Stuti Kumari **(advisor)**
2022-present: Rajani Shah **(advisor)**
2022-present: Himani Varolia **(advisor)**
2023-present: Abhishek Halder **(advisor)**
2023-present: Swarnava Samanta **(advisor)**

Master's Theses Supervised

2023-2024: Prateeksha Muddemmanavar **(Advisor)**
2023-2024: Nancy Jaiswal **(Advisor)**
2022-2023: K Maheswari **(Advisor)**
2022-2023: Prashant Sharma **(Advisor)**
2021-2022: Rishab Munjal **(Advisor)**
2021-2022: Kiran Sethi **(Advisor)**
2021-2022: Shivanshu Kukrety **(Advisor)**

2021-2022: Dinesh Joshi **(Advisor)**
2019-2020: Swagatam Chakraborti **(Advisor)**
2019-2020: Abhijit Raj **(Advisor)**
2019-2020: Princey Yadav **(Advisor)**
2019-2020: Sanket S Deshpande **(Advisor)**
2019-2020: Divya Sharma **(Advisor)**
2019-2020: Neha Jha **(Advisor)**
2018-2019: Ayushi Gupta **(Advisor)**
2018-2019: Shivam Sharma **(Advisor)**

Professional Service

Member, Editorial Board (select)

Member, Editorial Board, IETE Journal of Research (05/02/2021-Present)
Member, Editorial Board, Communications Biology (NPG journal) (28/01/2020-Present)
Academic Editor, PLOS one (16/01/2019-Present)
Member, Editorial Board, Scientific Reports (NPG journal) (2019-2023)
Department Editor, Crossroads, The ACM Magazine for Students (2011-2013)

Journal reviewer (select)

Oxford Bioinformatics
Nature Communications
Nature Methods
eLife
Nucleic Acids Research

Grant Review Panel / Faculty Hiring Committee (select)

University Grant Commission, INDIA
German Research Foundation, GERMANY
PMRF review committee, INDIA
Department of Science and Technology, INDIA
Loyola University Chicago, USA

Member, consortia/committees (select)

Global burden of disease collaborator network (2020-present)
Global consortium for chemosensory research (2020-present)
The Brookings India NFHS-4 Consortium (2018)

Courses Taught

Indraprastha Institute of Information Technology, Delhi, INDIA

CSE 101 Data structures and algorithms (Winter semester of 2024)
CSE 222/223 Analysis and design of algorithms (Winter semester of 2017, 18, 19, 20, 23)
CSE 558 Data Science (Monsoon semester of 2019)
BIO 552 Algorithms in Computational Biology (Monsoon semester of 2017, 18, 19, 20, 21)
BIO 321 Algorithms in Bioinformatics (2020, 21, 22, 23, 24)

Indian Statistical Institute, Kolkata, INDIA

Programming techniques and data structures (Monsoon, 2016)

National Rail and Transportation Institute, Vadodara, INDIA

PRL Programming languages (Winter semester of 2020)

Samsung Research India, Noida and Delhi campuses, INDIA

Advanced programming (2017)

University of Calcutta, Kolkata, INDIA

Introduction to Data Science (2017)

Honors

Select

2024: Humboldt Research Fellowship (Experienced Researcher)
2023: Institute Chair Professor (Inaugural), IIIT-D
2023: MERCK Young Scientist Award (Winner in Biological Sciences category), Merck India
2023: Elected Fellow, The National Academy of Sciences, India
2023: Adjunct Professor, QUT Brisbane
2023: Research Excellence Award, IIIT-D
2023: Faculty Research Award, Precision Group
2022: Young Innovator and Entrepreneur Award, INAE
2021: Department outstanding researcher, IIIT-D
2020: Adjunct Associate Professor QUT Australia
2015: INSPIRE Faculty Fellowship, DST

Others

2024: Faculty Research Award, Andromeda 360, Inc. dba Banavo.AI
2023: Faculty Research Award, Vaibhav Global Ltd.

2022: Faculty Research Award, Applied Solar Technologies
2019: Faculty Award, NextOrbit Platforms and Solutions Pvt. Ltd.
2014: INSPIRE Faculty Fellowship (not activated), DST
2012: Travel Award, DST
2012: Travel Award, NSF, USA
2011: Invention Award, Intellectual Ventures
2007: Infosys Spot Award, Infosys Ltd.

Publications

Highlights

Google Scholar page (with citation metrics:

https://scholar.google.co.in/citations?user=b-57qe4AAAAJ&hl=en

(h-index = 23; total citations = 2842)

(Corresponding author)*

Key publications as corresponding author: *Nucleic Acids Res. 2018a, 2018b, 2021; Nat. Comm. 2018, 2022; Genome Research 2021, 2023; Nat. ChemBio. 2022; Journal of Biological Chemistry 2022, eLife 2024*

Journal publications

1. Bhattacharya N, Rockstroh A, Deshpande SS, Thomas SK, Yadav A, Goswami C, Chawla S, Solomon P, Fourgeux C, Ahuja G, Hollier BG, …, Nelson CC*, **Sengupta D***. Pseudo-grading of tumor subpopulations from single-cell transcriptomic data using Phenotype Algebra. **eLife**. 2024 Aug 20;13.

2. Deka A, Kumar N, Basu S, Chawla M, Bhattacharya N, Ali SA, Bhawna, Madan U, Kumar S, Das B, **Sengupta D**, Awasthi A, Basak S. Non-canonical NF-κB signaling limits the tolerogenic β-catenin-Raldh2 axis in gut dendritic cells to exacerbate intestinal pathologies. **The EMBO Journal**. 2024 Jul 25:1-21.

3. Rai P, Jain A, Kumar S, Sharma D, Jha N, Chawla S, Raj A, Gupta A, Poonia S, Majumdar A, Chakraborty T*, Ahuja G*, and **Sengupta D*.** Literature mining discerns latent disease-gene relationships. **Bioinformatics.** Volume 40, Issue 4, April 2024, btae185

4. Arora U, **Sengupta D**, Kumar M, Tirupathi K, Sai MK, Hareesh, A., Chaithanya, ESS, Nikhila V, Bhavana N, Vigneshwar P and Rani A. Perceiving placental ultrasound image texture evolution during pregnancy with normal and adverse outcome through machine learning prism. **Placenta**. 2023. https://doi.org/10.1016/j.placenta.2023.07.014

5. Ghannoum S*, Fantini D, Zahoor M, Reiterer V, Phuyal S, Leoncio Netto W, Sørensen Ø, Iyer A, **Sengupta D**, Prasmickaite L, Mælandsmo GM, Köhn-Luque A*, Farhan H*. (2023). A combined experimental-computational approach uncovers a role for the Golgi matrix protein Giantin in

breast cancer progression. **PLoS computational biology**, 19(4), e1010995. Advance online publication. https://doi.org/10.1371/journal.pcbi.1010995

6. Mishra S, Pandey N, Chawla S, Sharma M, Chandra O, Jha IP, **Sengupta D**, Natarajan KN*, Kumar V*. Matching queried single-cell open-chromatin profiles to large pools of single-cell transcriptomes and epigenomes for reference supported analysis. **Genome Res.** 2023 Feb;33(2):218-231. doi: 10.1101/gr.277015.122. Epub 2023 Jan 18. PMID: 36653120.
7. Mohanty SK, Maryam S, Gautam V, Mittal A, Gupta K, Arora R, Bhadra W, Mishra T, **Sengupta D**, Ahuja G*. Transcriptional advantage influence odorant receptor gene choice. **Brief Funct Genomics**. 2022 Dec 18:elac052. Doi: 10.1093/bfgp/elac052. Epub ahead of print. PMID: 36542133.
8. Poonia S, Goel A, Chawla S, Bhattacharya N, Rai P, Lee YF, Yap YS, West J, Bhagat AA, Tayal J, Mehta A, Ahuja G, Majumdar A*, Ramalingam N*, **Sengupta D***. Marker-free characterization of full-length transcriptomes of single live circulating tumor cells. **Genome Res.** 2023 Jan;33(1):80-95. Doi: 10.1101/gr.276600.122. Epub 2022 Nov 22. PMID: 36414416; PMCID: PMC9977151.
9. Gautam V, Gupta R, Gupta D, Ruhela A, Mittal A, Mohanty SK, Arora S, Gupta R, Saini C, **Sengupta D**, Murugan NA. deepGraphh: AI-driven web service for graph-based quantitative structure–activity relationship analysis. **Briefings in Bioinformatics**. 2022 Sep;23(5):bbac288.
10. Gupta K, Balyan K, Lamba B, Puri M, **Sengupta D**, Kumar M*. Ultrasound placental image texture analysis using artificial intelligence to predict hypertension in pregnancy. **J Matern Fetal Neonatal Med.** 2022 Dec;35(25):5587-5594. doi: 10.1080/14767058.2021.1887847. Epub 2021 Feb 17. PMID: 33596762.
11. Flores BCT, Chawla S, Ma N, Sanada C, Kujur PK, Yeung R, Bellon MB, Hukari K, Fowler B, Lynch M, Chinen LTD, Ramalingam N*, **Sengupta D***, Jeffrey SS*. Microfluidic live tracking and transcriptomics of cancer-immune cell doublets link intercellular proximity and gene regulation. **Commun Biol.** 2022 Nov 12;5(1):1231. doi: 10.1038/s42003-022-04205-y. PMID: 36371461; PMCID: PMC9653407.
12. Chawla S, Rockstroh A, Lehman M, Ratther E, Jain A, Anand A, Gupta A, Bhattacharya N, Poonia S, Rai P, Das N, Majumdar A, Jayadeva, Ahuja G, Hollier BG, Nelson CC*, **Sengupta D***. Gene expression based inference of cancer drug sensitivity. **Nat Commun**. 2022 Sep 27;13(1):5680. Doi: 10.1038/s41467-022-33291-z. PMID: 36167836; PMCID: PMC9515171.
13. Gautam V, Gupta R, Gupta D, Ruhela A, Mittal A, Mohanty SK, Arora S, Gupta R, Saini C, **Sengupta D**, Murugan NA, Ahuja G*. deepGraphh: AI-driven web service for graph-based quantitative structure-activity relationship analysis. **Brief Bioinform.** 2022 Sep 20;23(5):bbac288. doi: 10.1093/bib/bbac288. PMID: 35868454.
14. Mittal A, Mohanty SK, Gautam V, Arora S, Saproo S, Gupta R, Sivakumar R, Garg P, Aggarwal A, Raghavachary P, Dixit NK, Singh VP, Mehta A, Tayal J, Naidu S, **Sengupta D***, Ahuja G*. Artificial intelligence uncovers carcinogenic human metabolites. **Nat Chem Biol**. 2022 Nov;18(11):1204-1213. Doi: 10.1038/s41589-022-01110-7. Epub 2022 Aug 11. PMID: 35953549.
15. Gupta P, Jindal A, Ahuja G, Jayadeva*, **Sengupta D***. A new deep learning technique reveals the exclusive functional contributions of individual cancer mutations. **J Biol Chem**. 2022

Aug;298(8):102177. doi: 10.1016/j.jbc.2022.102177. Epub 2022 Jun 24. PMID: 35753349; PMCID: PMC9304782.

16. Rai P, **Sengupta D***, Majumdar A. SelfE: Gene Selection via Self-Expression for Single-Cell Data. **IEEE/ACM Trans Comput Biol Bioinform.** 2022 Jan-Feb;19(1):624-632. doi: 10.1109/TCBB.2020.2997326. Epub 2022 Feb 3. PMID: 32750851.
17. Gautam V, Mittal A, Kalra S, Mohanty SK, Gupta K, Rani K, Naidu S, Mishra T, **Sengupta D**, Ahuja G*. EcTracker: Tracking and elucidating ectopic expression leveraging large-scale scRNA-seq studies. **Brief Bioinform.** 2021 Nov 5;22(6):bbab237. doi: 10.1093/bib/bbab237. PMID: 34184038.
18. Lall S, Sinha D, Ghosh A*, **Sengupta D***, Bandyopadhyay S*. Stable feature selection using copula based mutual information. **Pattern Recognition**. 2021 Apr 1;112:107697.
19. Gupta P*, Jindal A*, Jayadeva*, **Sengupta D***. Linear time identification of local and global outliers. **Neurocomputing**. 2021 Mar 14;429:141-50.
20. Gupta P*, Jindal A*, Jayadeva*, **Sengupta D***. Combi: Compressed binary search tree for approximate k-nn searches in hamming space. **Big Data Research**. 2021 Jul 15;25:100223.
21. Kinyoki D, Osgood-Zimmerman AE, Bhattacharjee NV; **Local Burden of Disease Anaemia Collaborators**; Kassebaum NJ, Hay SI*. Anemia prevalence in women of reproductive age in low- and middle-income countries between 2000 and 2018. **Nat Med.** 2021 Oct;27(10):1761-1782. doi: 10.1038/s41591-021-01498-0. Epub 2021 Oct 12. PMID: 34642490; PMCID: PMC8516651.
22. Gupta K, Yadav P, Maryam S, Ahuja G*, **Sengupta D***. Quantification of Age- Related Decline in Transcriptional Homeostasis. **J Mol Biol.** 2021 Sep 17;433(19):167179. doi: 10.1016/j.jmb.2021.167179. Epub 2021 Jul 30. PMID: 34339725.
23. Gupta R, Mittal A, Agrawal V, Gupta S, Gupta K, Jain RR, Garg P, Mohanty SK, Sogani R, Chhabra HS, Gautam V, Mishra T, **Sengupta D**, Ahuja G*. OdoriFy: A conglomerate of artificial intelligence-driven prediction engines for olfactory decoding. **J Biol Chem.** 2021 Aug;297(2):100956. doi: 10.1016/j.jbc.2021.100956. Epub 2021 Jul 12. PMID: 34265305; PMCID: PMC8342790.
24. Bhattacharjee NV, Schaeffer LE, Hay S*I; **Local Burden of Disease Exclusive Breastfeeding Collaborators**. Mapping inequalities in exclusive breastfeeding in low- and middle-income countries, 2000-2018. **Nat Hum Behav.** 2021 Aug;5(8):1027-1045. doi: 10.1038/s41562-021-01108-6. Epub 2021 Jun 3. PMID: 34083753; PMCID: PMC8373614.
25. Kalra S, Mittal A, Bajoria M, Mishra T, Maryam S, **Sengupta D***, Ahuja G*. Challenges and possible solutions for decoding extranasal olfactory receptors. **FEBS J.** 2021 Jul;288(14):4230-4241. doi: 10.1111/febs.15606. Epub 2020 Nov 6. PMID: 33085840
26. Gupta K, Lalit M, Biswas A, Sanada CD, Greene C, Hukari K, Maulik U, Bandyopadhyay S, Ramalingam N, Ahuja G, Ghosh A*, **Sengupta D***. Modeling expression ranks for noise-tolerant differential expression analysis of scRNA-seq data. **Genome Res.** 2021 Apr;31(4):689-697. doi: 10.1101/gr.267070.120. Epub 2021 Mar 5. PMID: 33674351; PMCID: PMC8015842.
27. Gupta K, Mohanty SK, Mittal A, Kalra S, Kumar S, Mishra T, Ahuja J, **Sengupta D***, Ahuja G*. The Cellular basis of loss of smell in 2019-nCoV-infected individuals. **Brief Bioinform.** 2021 Mar 22;22(2):873-881. Doi: 10.1093/bib/bbaa168. PMID: 32810867; PMCID: PMC7462334.

28. Chawla S, Samydurai S, Kong SL, Wu Z, Wang Z, Tam WL, **Sengupta D***, Kumar V*. UniPath: a uniform approach for pathway and gene-set based analysis of heterogeneity in single-cell epigenome and transcriptome profiles. **Nucleic Acids Res**. 2021 Feb 22;49(3):e13. doi: 10.1093/nar/gkaa1138. PMID: 33275158; PMCID: PMC7897496.
29. Gupta A, Choudhary M, Mohanty SK, Mittal A, Gupta K, Arya A, Kumar S, Katyayan N, Dixit NK, Kalra S, Goel M, Sahni M, Singhal V, Mishra T, **Sengupta D***, Ahuja G*. Machine-OlF-Action: A unified framework for developing and interpreting machine-learning models for chemosensory research. **Bioinformatics.** 2021 Jan 8:btaa1104. doi: 10.1093/bioinformatics/btaa1104. Epub ahead of print. PMID: 33416866.
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3. Jayadeva, Gupta, P., Jindal, A., and **Sengupta, D**., Compressed binary search tree for K-NN searches in hamming space (Indian patent application no.: 202011002697; Application date: 21/01/2020; Current status: Published)
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Talks/workshops/posters

Talks

32. Harnessing AI and Transcriptomics to Solve Oncology Grand Challenges, FLSB Seminar Series, South Asian University - Delhi, INDIA, Aug 23, 2024
31. Single cell data analysis at speed, Analysis of Next-Generation Sequencing Datasets from Bulk, Single-Cell, and Spatial Transcriptomics, ICGEB - Delhi, INDIA, Aug 08, 2024
30. [Convenor for DST, INDIA] India-Singapore e-Workshop: Advancements in Digital Health and Medical Technologies, july 16-17, INDIA/SINGAPORE
29. Shaping the future of disease cures with Big Data and AI, Research Scholar Day, School of Bioscience, IIT KGP, Feb 28, 2024
28. Harnessing AI and Transcriptomics to Solve Oncology Grand Challenges, Vistas in Life Sciences 2024, JNU, INDIA, Jan 24, 2024
28. Role of AI in accelerating healthcare innovations, CDRI - Lucknow, Lucknow, INDIA, Jan 11, 2024

27. Harnessing the Power of Artificial Intelligence in Blood-Based Detection and Personalized Treatment of Cancers, IISER Mohali, Mohali, INDIA, Jan 6, 2024
26. Transforming the landscape of disease cures: Exploring the path of Big Data and AI advancements, SCIC, JNU, Delhi, INDIA, Dec 13, 2023
25. AI driven precision oncology: Balancing promises and perils, Sophia Summit - 2023, Nice, FRANCE, Nov 22, 2023
24. AI-powered precision oncology: Tailoring cancer therapies for success, Indian Cancer Congress - 2023, Jio World Convention Centre, Mumbai, INDIA, Nov 02, 2023
23. Single cell transcriptomics – algorithms and applications, Deep Bioinformatics Boot Camp-2023, IHBT Palampur, INDIA, Aug 28-30, 2023
22. Shaping the future of disease cures with Big Data and AI, 4th INSA-Royal Society Yusuf Hamied Workshop on Artificial Intelligence, Indian National Science Academy, INDIA, Jul 24, 2023
21. Cellular ZIP codes, Center for Computational Biomedicine, Harvard University, US, Jun 06, 2023
20. Single cell biology through the lenses of big genomic data, Symposium on Big Data Algorithms for Biology 2023, Department of Computational and Data Sciences, IISC Bangalore, INDIA, Jun 02, 2023
19. Enabling precision oncology with transcriptomics and AI, 11th Workshop on Bioinformatics and Drug Design: Artificial Intelligence (AI) and Machine Learning (ML) Based Methods, Dr. B. R. Ambedkar Center for Biomedical Research (ACBR), University of Delhi, INDIA, Apr 19, 2023
18. Keynote lecture, Annual Departmental Seminar, Sri Venkateswara College, University of Delhi, INDIA, Mar 21, 2023
17. Role of AI in detection and treatment of cancer. Department of Biological Sciences and Bio-engineering, IIT Kanpur, INDIA, Feb 22, 2023
16. The power of naivety. Workshop on Human-Robot Interaction, IIIT-A, INDIA, Nov 25, 2022
15. Unwinding the healthcare hairball with AI. Webinar, MALAYSIA, Oct 08, 2022
14. Efficient algorithms for single-cell transcriptomics: Data to possibilities. Computational Workshop on Genomics, Proteomics and Metagenomics 2022 (CWGPM-2022), CSIR-IGIB, Delhi, INDIA, Jul 21, 2022
13. Indo-French Knowledge Summit: workshop on AI for Health Care. MANAV - The human atlas initiative, Webinar, Nov 26, 2021
12. Fast and accurate characterization of single cell transcriptomes. MANAV - The human atlas initiative, Webinar, Jun 03, 2021
11. Fast and accurate characterization of single cell transcriptomes. IAN INTERNATIONAL E-CONFERENCE XXXVIII Annual Meeting of Indian Academy of Neurosciences, Oct 06, 2020
10. Machine learning in healthcare: Case studies. Faculty Development Program “Artificial Intelligence and Machine learning using Python”. Jaypee Institute of Information Technology, INDIA, Aug 13, 2020
9. Hunting down rare cells. WEBINAR SERIES “Surge of Genomics Datasets: Microbes to Plants”. National Institute of Plant Genome research (NIPGR), INDIA May 19, 2020
8. A big data approach to single cell genomics. Imperial College London. Jan 31, 2020
7. Machine intelligence in health research – making a REAL difference. Symposium on Machine Learning for Science. International Institute of Information Technology – Hyderabad. Nov 30, 2019
6. Revolution in healthcare research with machine learning: Some case studies. One-day international symposium on “Recent trends in bioinformatics and big data analysis”. National Institute of Plant Genome research (NIPGR). Nov 08, 2019

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4. Hashing a cell: Efficient analysis of large scale single cell expression data. Symposium SySMics: Toward Systems Medicine based on Genomics. University of Nantes, France. Jun 18, 2019
3. Single cell transcriptomics: Challenges and remedies. Human Genetics Unit, Indian Statistical Institute, June 29, 2017
2. Hashing a cell. National workshop on computation for biomedicine and healthcare. IIIT-Delhi. Dec 12, 2018
1. Hashing single cell expression data. Elucidata, Delhi. Aug 24, 2018

Workshops

12. Single cell biology through the lenses of Big Genomic Data, National Workshop on Bioinformatics: AI in Healthcare, Bose Institute, Kolkata, INDIA, Jan 16, 2024
11. Enabling precision oncology with omics and AI. 11 th Workshop on Bioinformatics and Drug Design: Artificial Intelligence (AI) and Machine Learning (ML) Based Methods, Dr. B. R. Ambedkar Center for Biomedical Research (ACBR), University of Delhi, INDIA, Apr 19, 2023
10. Hidden Markov Model and its applications in modeling biological sequences. Algorithms that Transformed Molecular Biology, Indraprastha Institute of Information Technology, Delhi, INDIA, Mar 26, 2023
9. Single cell RNA-seq. BBC x InSyB 2022, e-conference, Nov 13, 2022
8. Introduction to R Studio. Research Methodology & Skill sets Workshop Program schedule, ICMR-National Institute of Nutrition, Hyderabad, INDIA, Oct 27, 2022
7. 5-days online workshop on Single-cell RNA-Seq data analysis. Pathfinder Research and Training Foundation. Jun 22-26, 2020
5. Introduction to Python programming. Faculty Development Program, Punjab University. Mar 3-4, 2020.
4. Elementary machine learning. Workshop on “Advanced in artificial intelligence and machine learning”. NIT Hamirpur. Aug 11, 2019
3. Finding rare cells from large scale scRNA-Seq data. Pre-Conference Workshop- IERG, Sankara Netralaya, Chenna. Jul 26, 2019
2. Introduction to machine learning. Banarsidas Chandiwala Institute of Information Technology (BCIIT). Jan 23, 2019
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Posters

3. Fast, scalable and accurate differential expression analysis of single cells: Application to mouse brain circulating tumor cells. Biology of Genomes - 2016. Cold Spring Harbor Laboratory, NY. May 10-14, 2016
2. A fast stochastic score based rank fusion method: Application on miRNA target prediction. 19th Annual International Conference on Intelligent Systems for Molecular Biology and 10th European Conference on Computational Biology (ISMB/ECCB 2011). Vienna, Austria. Jul 15-19, 2011
1. Mining Gene-TF-miRNA regulatory network. One of the 17 Ph.D. posters selected for presentation in Microsoft Research India organized TechVista 2011. Pune, India. Jan 21, 2011

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