Stanford



Deshan Perera

Postdoctoral Scholar, Biology

Bio

BIO

I am a Stanford Data Science Postdoctoral Scholar in the Department of Biology at Stanford University, supervised by Prof. Hunter Fraser. My research focuses on evolutionary dynamics and the development of high-performance computational tools to analyze complex biological systems. I earned my Ph.D. in Bioinformatics from the University of Calgary, Canada, where I investigated within-host evolution in pathogen genomics and cancer. Originally from Sri Lanka, I hold a First Class B.Sc. (Hons) in Biology from the University of Sri Jayewardenepura. I am passionate about advancing computational biology through the design and implementation of scalable software solutions that leverage GPU, CPU, and SSD architectures for large-scale genomic and evolutionary analysis.

HONORS AND AWARDS

- Stanford Data Science Postdoctoral Fellowship, Stanford Data Science (2025-09-01)
- Stanford Center for Computational, Evolutionary, and Human Genomics Postdoctoral Fellowship, Center for Computational, Evolutionary, and Human Genomics, Stanford University (2025-08-01)

PROFESSIONAL EDUCATION

- Ph.D., University of Calgary, Canada , Bioinformatics (2025)
- B.Sc., University of Sri Jayewardenepura, Sri Lanka , Biology/Biological Sciences, Honors (2018)

STANFORD ADVISORS

- Hunter Fraser, Postdoctoral Faculty Sponsor

LINKS

- Portfolio: https://sites.google.com/view/deshanperera

Research & Scholarship

RESEARCH INTERESTS

- Data Sciences

Publications

PUBLICATIONS

- **Tissue-specific transfer learning improves functional variant and therapeutic target discoveries in breast and prostate cancer** *PLOS GENETICS*
  Li, Q., Wang, D., Zhang, Z., Perera, D., Chen, Z., Wen, W., MacDonald, M., Cai, W., Yan, J., Shu, X., Zheng, W., Guo, X., Long, et al

2026; 22 (5): e1012145

- **Apollo: a comprehensive GPU-powered within-host simulator for viral evolution and infection dynamics across population, tissue, and cell** *NATURE COMMUNICATIONS*
  Perera, D., Li, E., Gordon, P. M. K., van der Meer, F., Lynch, T., Gill, J., Church, D. L., de Koning, A., Huber, C. D., van Marle, G., Platt, A., Long, Q.
  2025; 16 (1): 5783
- **cLD: Rare-variant linkage disequilibrium between genomic regions identifies novel genomic interactions** *PLOS GENETICS*
  Wang, D., Perera, D., He, J., Cao, C., Kossinna, P., Li, Q., Zhang, W., Guo, X., Platt, A., Wu, J., Zhang, Q.
  2023; 19 (12): e1011074
- **CATE: A fast and scalable CUDA implementation to conduct highly parallelized evolutionary tests on large scale genomic data** *METHODS IN ECOLOGY AND EVOLUTION*
  Perera, D., Reisenhofer, E., Hussein, S., Higgins, E., Huber, C. D., Long, Q.
  2023; 14 (8): 2095-2109
- **Interaction-integrated linear mixed model reveals 3D-genetic basis underlying Autism** *GENOMICS*
  Li, Q., Perera, D., Cao, C., He, J., Bian, J., Chen, X., Azeem, F., Howe, A., Au, B., Wu, J., Yan, J., Long, Q.
  2023; 115 (2): 110575
- **In silico study of SARS-CoV-2 spike protein RBD and human ACE-2 affinity dynamics across variants and Omicron subvariants** *JOURNAL OF MEDICAL VIROLOGY*
  Abeywardhana, S., Premathilaka, M., Bandaranayake, U., Perera, D., Peiris, L. C.
  2023; 95 (1): e28406
- **Reconstructing SARS-CoV-2 infection dynamics through the phylogenetic inference of unsampled sources of infection** *PLOS ONE*
  Perera, D., Perks, B., Potemkin, M., Liu, A., Gordon, P. M. K., Gill, M., Long, Q., van Marle, G.
  2021; 16 (12): e0261422
- **A Novel In Silico Benchmarked Pipeline Capable of Complete Protein Analysis: A Possible Tool for Potential Drug Discovery** *BIOLOGY-BASEL*
  Perera, D. D., Perera, K. L., Peiris, D. C.
  2021; 10 (11)
- **Reconstruction of Microbial Haplotypes by Integration of Statistical and Physical Linkage in Scaffolding** *MOLECULAR BIOLOGY AND EVOLUTION*
  Cao, C., He, J., Mak, L., Perera, D., Kwok, D., Wang, J., Li, M., Mourier, T., Gavriliuc, S., Greenberg, M., Morrissy, A., Sycuro, L. K., Yang, et al
  2021; 38 (6): 2660-2672
- **Antimicrobial activity of Plumbago indica and ligand screening of plumbagin against methicillin-resistant Staphylococcus aureus** *JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS*
  Dissanayake, D. H., Perera, D. D., Keerthirathna, L. R., Heendeniya, S., Anderson, R. J., Williams, D. E., Peiris, L. C.
  2022; 40 (7): 3273-3284
- **Evaluation of A Phylogenetic Pipeline to Examine Transmission Networks in A Canadian HIV Cohort** *MICROORGANISMS*
  Mak, L., Perera, D., Lang, R., Kossinna, P., He, J., Gill, M., Long, Q., van Marle, G.
  2020; 8 (2)
- **1,3-Dinitrobenze-Induced Genotoxicity Through Altering Nuclear Integrity of Diploid and Polyploidy Germ Cells** *DOSE-RESPONSE*
  Peiris, L. C., Chathu, P., Perera, D. D., Moore, H. D.
  2019; 17 (3): 1559325819876760