CURRICULUM VITAE

Madhavi K Ganapathiraju, PhD

BIOGRAPHICAL

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EDUCATION and TRAINING

UNDERGRADUATE

1990 - 1993	Delhi University New Delhi, India	B. Sc. 1993	Electronics, Mathematics and Physics

GRADUATE

1993 - 1998	Indian Institute of Science Bangalore, India	M. Engg. (Integrated) 1998	Electronics and Communications Engineering
2001 - 2007	Carnegie Mellon University Pittsburgh, PA, USA	PhD. 2007	Language and Information Technologies (Computer Science)

APPOINTMENTS and POSITIONS

ACADEMIC

1998-2000	Supercomputer Education and Research Center Indian Institute of Science Bangalore, India	Project Associate
2000	Institute for Software Research School of Computer Science Carnegie Mellon University Pittsburgh, PA	Visiting Scholar

2001-2007	Institute for Software Research School of Computer Science Carnegie Mellon University Pittsburgh, PA	Multimedia Computer Information Specialist
2008-2016	Department of Biomedical Informatics School of Medicine University of Pittsburgh Pittsburgh, PA	Assistant Professor
2008-	Intelligent Systems Program University of Pittsburgh Pittsburgh, PA	Assistant Professor
2008-	Joint CMU-Pitt PhD Program in Computational Biology Carnegie Mellon University Pittsburgh, PA	Faculty
2011-	Molecular and Cellular Cancer Biology Program University of Pittsburgh Cancer Institute Pittsburgh, PA	Member
2011-2021	Language Technologies Institute School of Computer Science Carnegie Mellon University Pittsburgh, PA	Affiliated Faculty
2012	Biotechnology Innovation and Computation Program School of Computer Science Carnegie Mellon University Pittsburgh, PA	Advisory Committee Member
2014-	Integrative Systems Biology Program School of Medicine University of Pittsburgh Pittsburgh, PA	Faculty
2016-	Department of Biomedical Informatics School of Medicine University of Pittsburgh Pittsburgh, PA	Associate Professor
2016-	Intelligent Systems Program University of Pittsburgh Pittsburgh, PA	Associate Professor
2021-2024	Language Technologies Institute, Carnegie Mellon University	Adjunct Faculty

2021-	Indian Institute of Science Alumni Association of North America	Member, Advisory Board
2021-	KEATS USA (nonprofit organization)	Advisor, Outreach
2022-2024	Carnegie Mellon University of Qatar	Visiting Associate Teaching Professor of Computational Biology and Computer Science
2022-	University of Pittsburgh Clinical and Translational Science Institute	Associate Professor (Secondary Appointment)

MEMBERSHIPS in PROFESSIONAL and SCIENTIFIC SOCIETIES

2021-2025	Member, Scientific Advisory Board, Mesothelioma Applied Research Foundation
2022-24	Member, International Society for Computational Biology
2025-	Member, American Heart Association

HONORS

Title of Award	**Year**
Bhavishya Joythi (Light of the Future) Graduate Training Scholarship National Institute of Information Technology, India	1990-1993
Graduate Student Scholarship Indian Institute of Science, India	1994-1996
Biobehavioral Research Awards for Innovative New Scientists (BRAINS) Award National Institute of Mental Health, United States	2011

PUBLICATIONS

ORIGINAL PEER REVIEWED ARTICLES: **Journals**

1. <u>Ganapathiraju MK</u>**,** Klein-Seetharaman J, Balakrishnan N, Reddy R.
   Characterization of Protein Secondary Structure using Latent Semantic Analysis.
   IEEE Signal Processing Magazine. 2004 May;21(3):78-87.
   doi: 10.1109/MSP.2004.1296545.

2. <u>Ganapathiraju MK</u>, Manoharan V, Klein-Seetharaman J.
   BLMT: Statistical sequence analysis using n-grams.
   Appl Bioinformatics. 2004;3(2-3):193-200. doi: 10.2165/00822942-200403020-00013.
   PubMed PMID: 15693744.

3. Ganapathiraju MK, Balakrishnan M, Balakrishnan N, Reddy R.
   Om: One tool for many (Indian) languages.
   Journal of Zhejiang University SCIENCE. 2005 Oct;6A(11):1348-1353.

4. Tastan O, Yu E, Ganapathiraju MK, Aref A, Rader AJ, Klein-Seetharaman J.
   Comparison of stability predictions and simulated unfolding of rhodopsin structures.
   Photochem Photobiol. 2007 Mar-Apr;83(2):351-62. doi: 10.1562/2006-06-20-RA-942.
   PubMed PMID: 17576347.

5. Balakrishnan N, Reddy R, Ganapathiraju MK**,** Ambati V.
   Digital Library of India: a testbed for Indian language research.
   IEEE Technical Committee on Digital Libraries (TCDL) Bulletin. 2006;3(1).

6. Iannaccone A, Man D, Waseem N, Jennings BJ, Ganapathiraju MK, Gallaher K, Reese E, Bhattacharya SS, Klein-Seetharaman J.
   Retinitis pigmentosa associated with rhodopsin mutations: Correlation between phenotypic variability and molecular effects.
   Vision Research. 2006 Dec;46(27):4556-67. doi: 10.1016/j.visres.2006.08.018.
   PubMed PMID: 17014888.

7. Poddar A, Chandra N, Ganapathiraju MK, Sekar K, Klein-Seetharaman, Reddy R, Balakrishnan N.
   Evolutionary insights from suffix array-based genome sequence analysis.
   Journal of Biosciences. 2007 Aug;32(5):871-81. PubMed PMID: 17914229.

8. Ganapathiraju MK**,** Jursa CJ, Karimi HA, Klein-Seetharaman J.
   TMpro web server and web service: transmembrane helix production through amino acid property analysis.
   Bioinformatics. 2007 Oct 15;23(20):2795-6. doi: 10.1093/bioinformatics/btm398.
   PubMed PMID: 17724062.

9. Ganapathiraju MK, Balakrishnan N, Reddy R, Klein-Seetharaman J.
   Transmembrane helix prediction using amino acid properties and latent semantic analysis.
   BMC Bioinformatics. 2008;9 Suppl 1:S4. doi: 10.1186/1471-2105-9-S1-S4. PubMed PMID: 18315857.

10. Mohamed TP, Carbonell JG, Ganapathiraju MK.
    Active learning for human protein-protein interaction prediction.
    BMC Bioinformatics. 2010 Jan 18;11 Suppl 1:S57. doi: 10.1186/1471-2105-1-S1-S57.
    PubMed PMID: 20122232.

11. Osmanbeyoglu HU, Wehner JA, Carbonell JG, Ganapathiraju MK.
    Active machine learning for transmembrane helix prediction.
    BMC Bioinformatics. 2010 Jan 18;11 Suppl 1:S58. doi: 10.1186/1471-2105-11-S1-S58.
    PubMed PMID: 20122233.

12. Osmanbeyoglu HU, Ganapathiraju MK.
    N-gram analysis of 970 microbial organisms reveals presence of biological language models. **BMC Bioinformatics**. 2011 Jan 10;12:12. doi: 10.1186/1471-2105-12-12.
    PubMed PMID: 21219653.

13. Ananthasubramanian S, Metri R, Khetan A, Gupta A, Handen A, Chandra N, Ganapathiraju MK. Mycobacterium tuberculosis and Clostridium difficille interactomes: demonstration of rapid development of computational system for bacterial interactome prediction.
    Microbian Informatics and Experimentation. 2012 Mar 21;2:4. doi: 10.1186/2042-5783-2-4. PubMed PMID: 22587966.

14. Orii N, Ganapathiraju MK.
    Wiki-Pi: a web server of annotated human protein-protein interactions to aid in discovery of protein function.
    PLoS ONE. 2012 Nov 28;7(11): e49029. doi: 10.1371/journal.pone.0049029. PubMed PMID: 23209562.

15. Thahir M, Sharma T, Ganapathiraju MK.
    An efficient heuristic method for active feature acquisition and its application to protein-protein interaction prediction.
    BMC Proceedings. 2012 Nov 13;6 Suppl 7:S2. doi: 10.1186/1753-6561-6-S7-S2. PubMed PMID: 23173746.

16. Ganapathiraju MK, Mitchell AD, Thahir M, Motwani K, Ananthasubramanian S.
    Suite of tools for statistical n-gram language modeling for pattern mining in whole genome sequences.
    Journal of Bioinformatics and Computational Biology. 2012 Dec;10(6):1250016. doi: 10.1142/S0219720012500163. PubMed PMID: 22817111.

17. Giorgio E, Rolyan H, Kropp L, Chakka AB, Yatsenko S, Gregorio ED, Lacerenza D, Vaula G, Talarico F, Mandich P, Toro C, Pierre EE, Labauge P, Capellari S, Cortelli P, Vairo FP, Miguel D, Stubbolo D, Marques LC, Gahl W, Boespflug-Tanguy O, Melberg A, Hassin-Baer S, Cohen OS, Pjontek R, Grau A, Klopstock T, Fogel B, Meijer I, Rouleau G, Bouchard JP, Ganapathiraju MK, Vanderver A, Dahl N, Hobson G, Brusco A, Brussino A, Padiath QS.
    Analysis of LMNB1 Duplications in Autosomal Dominant Leukodystrophy Provides Insights into Duplication Mechanisms and Allele-Specific Expression.
    Human Mutation. 2013 Aug;34(8):1160-71. doi: 10.1002/humu.22348. Erratum in: Hum Mutat. 2014 Jan;35(1):149. PubMed PMID: 23649844.

18. Ganapathiraju MK, Orii N.
    Research prioritization through prediction of future impact on biomedical science: a position paper on inference-analytics.
    Gigascience. 2013 Aug 30;2(1):11. doi: 10.1186/2047-217X-2-11. PubMed PMID: 24001106.

19. Kuppuswamy U, Ananthasubramanian S, Wang Y, Balakrishnan N, Ganapathiraju MK.
    Predicting gene ontology annotations of orphan GWAS genes using protein-protein interactions. **Algorithms in Molecular Biololgy**. 2014 Apr 3;9(1):10. doi: 10.1186/1748-7188-9-10. PubMed PMID: 24708602.

20. Zhu J, Zhang Y, Ghosh A, Cuevas RA, Forero A, Dhar J, Ibsen MS, Schmid-Burgk JL, Schmidt T, Ganapathiraju MK, Fujita T, Hartmann R, Barik S, Hornung V, Coyne CB, Sarkar SN. Antiviral Activity of Human OASL Protein Is Mediated by Enhancing

Signaling of the RIG-I RNA Sensor. **Immunity**. 2014 Jun 19; 40(6): 936–48. doi: 10.1016/j.immuni.2014.05.007. PubMed PMID: 24931123.

21. Roth A, Subramanian S, Ganapathiraju MK. Towards extracting supporting information about predicted protein-protein interactions. **IEEE/ACM Trans Comput Biol Bioinform**. 2018 Jul-Aug;15(4):1239-1246. doi: 10.1109/TCBB.2015.2505278. PubMed PMID: 26672046.

22. Li Y, Klena NT, Gabriel GC, Liu X, Kim AJ, Lemke K, Chen Y, Chatterjee B, Devine W, Damerla RR, Chang C, Yagi H, San Agustin JT, Thahir M, Anderton S, Lawhead C, Vescovi A, Pratt H, Morgan J, Haynes L, Smith CL, Eppig JT, Reinholdt L, Francis R, Leatherbury L, Ganapathiraju MK, Tobita K, Pazour GJ, Lo CW. Global genetic analysis in mice unveils central role for cilia in congenital heart disease. **Nature**. 2015 May 28;521(7553):520-4. doi: 10.1038/nature14269. PubMed PMID: 25807483.

23. Handen A, Ganapthiraju MK. LENS: web-based lens for enrichment and network studies of human proteins. **BMC Medical Genomics**. 2015;8(Suppl 4):S2. doi: 10.1186/1755-8794-8-S4-S2. PubMed PMID: 26680011.

24. Ganapathiraju MK, Chaparala S. Schizophrenia interactome: fully-labeled interactome network. **NPJ Schizophr**. 2016. doi: 10.1038/npjschz.2016.25. PubMed PMID: 27602386.

25. Embar V, Handen A, Ganapathiraju MK. Is the average shortest path length of gene set a reflection of their biological relatedness? **Journal of Bioinformatics and Computational Biology**. 2016 Dec;14(6):1660002. doi: 10.1142/S0129720016600027. PubMed PMID: 28073302.

26. Subramanian S, Chaparala S, Avali V, Ganapathiraju MK. A pilot study on the prevalence of DNA palindromes in breast cancer genomes. **BMC Medical Genomics**. 2016 Dec;9(Suppl 3):73. doi: 10.1186/s12920-016-0232-3. PubMed PMID 28117658.

27. Chattopadhyay A, Ganapathiraju MK. Demonstration Study: A Protocol to Combine Online Tools and Databases for Identifying Potentially Repurposable Drugs. **Data**. 2017 May 24;2(2).

28. Malavia TA, Chaparala S, Wood J, Chowdari K, Prasad KM, McClain L, Jegga AG, Ganapathiraju MK, Nimgaonkar VL. Generating Testable Hypotheses for Schizophrenia and Rheumatoid Arthritis Pathogenesis by Integrating Epidemiological, Genomic and Protein Interaction Data. **NPJ Schizophrenia**. 2017 Feb 24;3:11. doi: 10.1038/s41537-017-0010-z. 2017. PubMed PMID: 28560257.

29. Liu X, Yagi H, Saeed S, Bais AS, Gabriel GC, Chen Z, Peterson KA, Li Y, Schwartz MC, Reynolds WT, Saydmohammed M, Gibbs B, Wu Y, Devine W, Chatterjee B, Klena NT, Kostka D, de Mesy Bentley KL, Ganapathiraju MK, Dexheimer P, Leatherbury L, Khalifa O, Bhagat A, Zahid M, Pu W, Watkins S, Grossfeld P, Murray SA, Porter GA Jr, Tsang

M, Martin LJ, Benson DW, Aronow BJ, Lo CW. The complex genetics of hypoplastic left heart syndrome.
Nature Genetics. 2017 Jul;49(7):1152-1159. doi: 10.1038/ng.3870. PubMed PMID: 28530678.

30. Ganapathiraju MK, Karunakaran KB, Correa-Menendez J. Predicted protein interactions of IFITMs may shed light on mechanisms of Zika virus-induced microcephaly and host invasion.
F1000 Research. 2016 Aug 5 [revised 2017 Nov 21];5:1919.
doi: 10.12688/f1000research9364.2. PubMed PMID: 2933329.

31. Subramanian S, Ganapathiraju MK. Antibody Exchange: Information extraction of biological antibody donation and a web-portal to find donors and seekers.
Data. 2017 Dec;2(4). pii: 38. doi: 10.3390/data2040038. PubMed PMID: 30498741.

32. Karunakaran KB, Chaparala S, Ganapathiraju MK.
Potentially repurposable drugs for schizophrenia identified from its interactome.
Scientific Reports. 2019 Sep 3;9(1):1-4.

33. Ganapathiraju MK, Subramanian S, Chaparala C and Karunakaran KB
A catalog of all DNA Palindromes in human genome and their variations in 1000 Genomes. **Human Genome Variation,** 7, 40 (2020).

34. Karunakaran KB, Chaparala S, Lo CW and Ganapathiraju MK
Cilia interactome with predicted protein–protein interactions reveals connections to Alzheimer's disease, aging and other neuropsychiatric processes.
Scientific Reports. September 2020.10 (15629).

35. Karunakaran K, Yanamala N, Boyce G, Becich MJ, Ganapathiraju MK. Malignant Pleural Mesothelioma Interactome with 364 Novel Protein-Protein Interactions. MDPI Cancers. Special Issue on Malignant Mesotheliomas.
Cancers (Basel) 2021, *13*(7), 1660

36. Karunakaran KB, Amemori S, Balakrishnan N, Ganapathiraju MK & Amemori K. Generalized and social anxiety disorder interactomes show distinctive overlaps with striosome and matrix interactomes. *Sci Rep* 11, 18392 (2021).
https://doi.org/10.1038/s41598-021-97418-w

37. Thapliyal H, Michael K, Mohanty SP, Srinivas MB, Ganapathiraju MK. Consumer Technology-Based Solutions for COVID-19. IEEE Consumer Electronics Magazine, vol. 10, no. 2, pp. 64-65, 1 March 2021, doi: 10.1109/MCE.2020.3040513.

38. Xu X, Jin K, Bais AS, Zhu W, Yagi H, Feinstein TN, Nguyen P, Criscione J, Liu1 X, Beutner G, Karunakaran KB, Adams P, Kuo CK, Kostka D, Pryhuber GS, Shiva S, Ganapathiraju MK, Porter Jr GA Jr, Ivy Lin JH, Aronow B, Lo CW. iPSC modeling shows uncompensated mitochondrial mediated oxidative stress underlies early heart failure in hypoplastic left heart syndrome. bioRxiv May 2021
021.05.09.443165; doi: https://doi.org/10.1101/2021.05.09.443165

39. Faubel RJ, Santos Canellas VS, Gaesser J, Beluk NH, Feinstein TN, Wang Y, Yankova M, Bindu K, King SM, Ganapathiraju MK, Lo CW. Mispatterned motile cilia beating causes flow blockage in the epileptic brain. bioRxiv, 30 Oct 2021

40. Xinxiu Xu, Kang Jin, Abha S. Bais, Wenjuan Zhu, Hisato Yagi, Timothy N. Feinstein, Phong K. Nguyen, Joseph D. Criscione, Xiaoqin Liu, Gisela Beutner, Kalyani B. Karunakaran, Krithika S. Rao, Haoting He, Phillip Adams, Catherine K. Kuo, Dennis Kostka, Gloria S. Pryhuber, Sruti Shiva, Madhavi K. Ganapathiraju, George A. Porter, Jiuann-Huey Ivy Lin, Bruce Aronow, Cecilia W. Lo. Uncompensated mitochondrial oxidative stress underlies heart failure in an iPSC-derived model of congenital heart disease. Cell Stem Cell 2022. Online 4/7/22 https://doi.org/10.1016/j.stem.2022.03.003

41. Dunham B and Ganapathiraju MK. Benchmark Evaluation of Protein–Protein Interaction Prediction Algorithms. Molecules 2022 Jan: 27(1):4. Published online 2021 Dec 22. https://doi.org/10.3390/molecules27010041. PMID 35011283. PMCID: PMC8746451

42. Faubel, R.J., Santos Canellas, V.S., Gaesser, J. *et al.* Flow blockage disrupts cilia-driven fluid transport in the epileptic brain. Acta Neuropathologica. *August* (2022). https://doi.org/10.1007/s00401-022-02463-y

43. Karunakaran KB, Gabriel GC, Balakrishnan N, Lo CW, Ganapathiraju MK. Novel Protein-Protein Interactions Highlighting the Crosstalk between Hypoplastic Left-Heart Syndrome, Ciliopathies and Neurodevelopmental Delays. **Genes**, 13 (4), pp 627, 2022.

44. Karunakaran KB, Balakrishnan N and Ganapathiraju MK. Interactome of SARS-CoV-2 modulated host proteins with computationally predicted PPIs: Insights from illustrative translational systems biology studies. Frontiers in Systems Biology, Section on Systems and Synthetic Immunology, vol 2, 2022.

45. Karunakaran KB, Ganapathiraju MK, Jain S, Brahmachari S and Balakrishnan N. Drug Contraindications in Comorbid Diseases: a Protein Interactome Perspective **Network Modeling Analysis in Health Informatics and Bioinformatics**, 13 (10), 2024.

46. Karunakaran KB, Jain S, Brahmachari S, Balakrishnan N and Ganapathiraju MK. Parkinson's disease and schizophrenia interactomes contain temporally distinct gene clusters underlying comorbid mechanisms and unique disease processes **Schizophrenia,** 10 (1), 26, 2024.

47. Gabriel GC, Ganapathiraju MK, Lo CW The Role of Cilia and the Complex Genetics of Congenital Heart Disease. **Annual Review of Genomics and Human Genetics**, vol 25, 2024.

48. Karunakaran KB and Ganapathiraju MK . Malignant peritoneal mesothelioma interactome with 417 novel protein–protein interactions. **BJC Reports**, 2(42), 2024

49. Ganapathiraju MK, Triptish B, Deshpande S, Wesesky M, Wood J, Nimgaonkar VL. Schizophrenia interactome derived repurposable drugs and randomized control trials of two candidates. **Biological Psychiatry**, **96**(8), pp 651-658, 2024.

50. Gabriel GC, Yagi H, Tan T, Bais A, Glennon BJ, Stapleton MC, Huang L, Reynolds WT, Shaffer MG, Ganapathiraju MK, Simon D, Panigrahy A., Wu YL. and Lo CW. Mitotic block and epigenetic repression underlie neurodevelopmental defects and neurobehavioral deficits in congenital heart disease, **Nature Communications**. **16**(1):469. 2025 Jan 7.

Preprints

1. Karunakaran KB, Balakrishnan N and Ganapathiraju, MK. GPX4-associated Sedaghatian Type Spondylometaphyseal Dysplasia: A Protein Interactome Perspective. **bioRxiv** (Preprint), *2022*.
2. Discovery of Inverted Repeats and Palindromes in Viral Genomes.
   Sen M, Rivera GM, Gao J, Shtrahman M, and Ganapathiraju MK.
   biorxiv. November 2025

ORIGINAL PEER REVIEWED ARTICLES: **Full-length Conference Proceedings**

1. Ganapathiraju MK, Weisser D, Klein-Seetharaman J, Rosenfeld R, Carbonell J, Reddy R. Comparative n-gram analysis of whole-genome sequences.
   HLT'02: Human Language Technologies Conference, San Diego, March 2002.
2. Ganapathiraju MK, Balakrishnan N, Reddy R. Improving Recognition Accuracy on CVSD speech in mismatched conditions.
   WSEAS Transactions on Computers, Vol 2, Issue 4, October 2003.
3. Sivaraman B, Ganapathiraju MK, Klein-Seetharaman J, Balakrishnan N, Reddy R. Extensions to Biological Language Modeling Toolkit (BLMT).
   BLC2003: Biological Language Conference, Pittsburgh USA, November 2003.
4. Ganapathiraju MK, Weisser D, Reddy R, Klein-Seetharaman J. Yule value tables from Protein Datasets of different categories: emphasis on membrane proteins.
   Proc. SCI2004, Florida, USA, 2004.
5. Jayaraman A, Sangani S, Ganapathiraju MK, Balakrishnan N.
   OmSE: Tamil Search Engine.
   Proc. Tamil Internet conference, pp 23-29, December 2004.
6. Balakrishnan N, Reddy R, Ganapathiraju MK, Gogineni H. Million Books to Web: Technological Challenges and Research Issues.
   Proc. Tamil Internet conference, pp 227-242, December 2004.
7. Manoharan V, Ganapathiraju MK, Klein-Seetharaman J. BLMT Web Server: Interactive Language Technologies for Analogous Biological Data.
   Workshop on Ambient Intelligence and (Everyday) Life, Donostia, San-Sebastian, Spain, 2005.
8. Ganapathiraju MK, Levin L. TelMore: Morphological Generator for Telugu Nouns and Verbs. **Proc. Second International Conference on Universal Digital Library**, Vol Alexandria, Egypt, Nov 17-19, 2006.

9. Balajapally P, Pydimarri P, Ganapathiraju MK, Balakrishnan N, Reddy R. Multilingual Book Reader: Transliteration, Word-to-Word Translation and Full-text Translation. **VALA 2006: 13th Biennial Conference and Exhibition Conference of Victorian Association for Library Automation**, Melbourne, Australia, February 8-10, 2006.

10. Osmanbeyoglu H, Ganapathiraju MK. Rapid Deployment of Viral-Human Interactome Prediction for New Viruses. **AMIA Translational Bioinformatics Summit**, San Francisco, USA, March 7-9, 2011.

11. Ganapathiraju MK, Thahir M, Mitchell AD. Applying N-Gram Language Modeling for Pattern Mining in Whole Genome Sequences. **LBM2011: Languages in Biology and Medicine**, Singapore, 2011.

12. Ananthasubramanian S, Carbonell JG, Ganapathiraju MK. Oracle Characterization for Active Learning for Protein-Protein Interaction Prediction. **WCSB 2013**; Finland. 2013.

13. Gupta A, Wang H, Ganapathiraju MK. Learning structure in gene expression data using deep architectures, with an application to gene clustering. **IEEE International Conference on Bioinformatics and Biomedicine**. Washington, DC pp. 1328-1335. doi: 10.1109/BIBM.2015.7359871. 2015

14. Sundaravadivel P, Mohanty SP, Kougianos E, Yanambaka VP, Ganapathiraju MK. Smart-walk: An intelligent physiological monitoring system for smart families. **IEEE International Conference on Consumer Electronics**. 2018 Jan 12-14, Las Vegas, NV. 1-4. doi: 10.1109/ICCE.2018.8326065.

15. Sundaravadivel P, Kesavan K, Kesavan L, Mohanty SP, Kougianos E, Ganapathiraju MK. Smart-log: An automated, predictive nutrition monitoring system for infants through the IoT. **IEEE International Conference on Consumer Electronics**. 2018 Jan 12-14, Las Vegas, NV. 1-4. doi: 10.1109/ICCE.2018.8326068.

16. L Rachakonda, A Kothari, SP Mohanty, E Kougianos, Ganapathiraju MK. Stress-Log: An IoT-based Smart System to Monitor Stress-Eating **IEEE International Conference on Consumer Electronics**, 1-6, Las Vegas, 2019

17. Laavanya Rachakonda, S. P. Mohanty, E. Kougianos, K. B. Karunakaran and Ganapathiraju MK. Smart-Pillow: An Ease Device for Stress Detection Considering Sleeping Habits. **IEEE International Symposium on Smart Electronic Systems (IEEE SES)**, Hyderabad, India, 2018

18. Rachakonda L, Sundaravadivel P, Mohanty SP, Kougianos E, Ganapathiraju MK. A smart sensor in the IoMT for stress level detection. **IEEE International Symposium on Smart Electronic Systems (iSES)** 2018 Dec 17 (pp. 141-145).

REFEREED ARTICLES: SHORT PAPERS

1. Ganapathiraju MK, Klein-Seetharaman J, Rosenfeld R, Carbonell J, Reddy R. Rare and Frequent Amino Acid N-grams in Whole-Genome Protein Sequences. **RECOMB: International Conference on Research in Computational Molecular Biology**. 2002.

2. Mitchell A, Mohamed T, Motwani K, Ganapathiraju MK.
   Pattern Landscape of the Human Genome.
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3. Mohamed T, Ganapathiraju MK. Statistical N-gram Modeling of Genomes for Pattern Discovery.
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4. Osmanbeyoglu H, Ganapathiraju MK. Using Active Learning to Identify Membrane Protein Sequences that Potentially Conform to Novel Topologies.
   AMIA Translational Bioinformatics Summit; San Francisco, CA. 2010.

5. Orii N, Ganapathiraju MK. Wiki-Pi: a web-resource to aid in the discovery of gene function via protein-protein interactions.
   AMIA Translational Bioinformatics Summit. San Francisco, CA. 2013.

6. Kuppuswamy U, Ananthasubramanian A, Wang Y, Balakrishnan N, Ganapathiraju MK**.**
   Gene Ontology Annotation Prediction for GWAS Genes using Protein-Protein Interactions
   AMIA Translational Bioinformatics Summit; San Francisco, CA. 2013.

7. Orii N, Viswanathan L, Ganapathiraju MK. Prioritizing Experimental Validations of Computational Predictions based on Estimated Biomedical Impact.
   AMIA Translational Bioinformatics Summit; San Francisco, CA. 2014.

8. Handen A, Ganapathiraju MK. Web-based Protein-Interaction Network Analysis Pipeline
   AMIA Translational Bioinformatics Summit; San Francisco, CA. 2014.

9. Wang H, Ganapathiraju MK. New Metric for Evaluating Protein-protein Interaction Prediction
   AMIA Translational Bioinformatics Summit; San Francisco, CA. 2015.

10. Li H, Gupta A, Ganapathiraju MK. DNA Palindromes in Human Genome.
    AMIA Translational Bioinformatics Summit; San Francisco, CA. 2015.

11. Gao J, Rivera GM, Sen M, Shtrahman M, Ganapathiraju MK**.**
    Analysis of Inverted Repeats in Viral Genomes at a Large Scale.
    Intelligent Systems for Molecular Biology, Session on Critical Assessment of Massive Data Analysis (CAMDA), Montreal, ON, Canada, 2024.

12. Machine Learning Driven Interactome Discovery and Analysis Reveals Shared and Distinct Functional Mechanisms in Pleural and Peritoneal Mesotheliomas.
    Karunakaran KB and Ganapathiraju MK.
    17th International Mesothelioma Interest Group (iMig) Conference, Philadelphia 26-29, 2025

BOOKS, BOOK CHAPTERS AND MONOGRAPHS

1. Ganapathiraju MK. *Speech Recognition on MPEG/Audio*
   M. Egg. Thesis, Indian Institute of Science, 1998.
2. Ganapathiraju, MK and Carbonell J. Relevance of Cluster Size in MMR Summarization
   Class Report with 15+ Citations. Carnegie Mellon University, Pittsburgh, PA 2002

3. Ganapathiraju MK, Balakrishnan N, Reddy R, Klein-Seetharaman J. Computational Biology and Language. **Lecture Notes in Artificial Intelligence**, LNCS/LNAI. 2004. 3345.

4. Ganapathiraju MK, Manoharan V, Reddy R, Judith Klein-Seetharaman J. Collaborative Discovery and Biological Language Modeling Interface. **Lecture Notes in Artificial Intelligence**, LNCS/LNAI. 2006. 3864.

5. Ganapathiraju MK. *Application of Language Technologies to Biology: Feature Recognition and Modeling for Transmembrane Helix Prediction* **PhD Thesis**, Carnegie Mellon University, CMU-LTI-07-004, 2007

6. Schleker S, Ananthasubramanian S, Klein-Seetharaman J, Ganapathiraju MK. Prediction of intra- and inter-species PPIs facilitating systems biology studies. **Protein-Protein Interactions in Drug Discovery**. Wiley-VCH GmbH & Co. 2013. 21-53.

OTHER PUBLICATIONS:

PUBLISHED ABSTRACTS

1. Klein-Seetharaman J, Ganapathiraju MK, Rosenfeld R, Carbonell J, Reddy R. Differences in usage of local combinations of amino acids in various genomes. International Symp. Crystallography and Bioinformatics in Structural Biology. India. 2001.

2. Ganapathiraju MK, Klein-Seetharaman J, Rosenfeld R, Carbonell J, Reddy R. Comparative n-gram analysis of genome sequences. International Symp. Crystallography and Bioinformatics in Structural Biology. India. 2001.

3. Wehner J, Ganapathiraju MK. An Algorithm to Guide the Selection of Specific Molecules for Future Web-Lab Experiments. Advancing Practice, Instruction and Innovation through Informatics; Pittsburgh, PA. 2008.

4. Mohamed T, Mitchell A, Ganapathiraju MK. Open Access Toolkit for Nonparametric Explorative Pattern Mining to Detect Events Relating to Disease in Large Scale Genome Sequences. Advancing Practice, Instruction and Innovation through Informatics. Pittsburgh, PA. 2008.

5. Ganapathiraju MK, Thahir M. PNI systems biology: Computational prediction of novel interactions of inflammatory proteins with accuracy on-par with experimental methods. Brain, Behavior, and Immunity. 24, S46. 2010.

6. Ganapathiraju MK, Thahir M. Cytokine interactome to accelerate discovery in deciphering molecular interactions among psycho neuro immuno inflammo processes. Brain, Behavior, and Immunity. 25, S237-S238. 2011.

7. Ganapathiraju MK, Sweet RA, Thahir M. Newly discovered PPIs of schizophrenia genes and their biomedical significance. Brain, Behavior, and Immunity. 25, S227. 2011.

8. Sarkar SN, Zhang Y, Zhu J, Forero A, Ganapathiraju MK, Hartmann R and Coyne C. The

oligoadenylate synthetase-like protein enhances cellular antiviral activity through RIG-I pathway. **The Journal of Immunology**, 188 (1 Supplement) 68.3, 2012

9. Zhu J, Zhang Y, Cuevas R, Forero A, Dhar J, Ibsen M, Schmid-Burgk J, Schmidt T, Ganapathiraju MK, Fujita T, Hartmann R, Chen Z, Barik S, Hornung V, Coyne C, Sarkar S. Antiviral activity of human OASL is mediated by mimicking ubiquitin chains to activate RIG-I pathway **The Journal of Immunology,** 192 (1 Supplement). pp 122.18-122.18, 2014.

10. Cheng S, Gupta R, Hammond T, Viswanathan LC, Ganapathiraju MK. Distribution of Palindromes in the Human Genome. Journal of Pathology Informatics, 5: 12. 2014.

11. Ganapathiraju MK, Chaparala S, Lo C. Cilia, an organelle central to sychoneuroimmunology–A characterization through its interactome. Brain, Behavior, and Immunity, 57 (e33-e34). 2016.
12. Ganapathiraju MK, Balakrishnan N. T188: Massive Open Online Discovery ‘Mood’ For Schizophrenia Research. Schizophrenia Bulletin. 2018 April 1; 44(Suppl 1): S189. doi: 10.1093/schbul/sby016.464.

13. Ganapathiraju M, Chaparala S, Lo C. Elucidating the Role of Cilia in Neuropsychiatric Diseases Through Interactome Analysis. **Schizophrenia Bulletin**. 2018 Apr 1;44(suppl_1):S298-9.

14. Karunakaran KB and Ganapathiraju MK. Alzheimer’s Disease, Aging and the Sonic Hedgehog Pathway Connections Highlighted through Protein Interactome, Alzheimer's & Dementia. The Journal of the Alzheimer's Association, 15 (7) pp. P1012-P1013, 2019.

15. Gao J, Rivera GM, Sen M, Shtrahman M, Ganapathiraju MK . Large Scale Discovery of Palindromes and Inverted Repeats in Viral Genomes. **International Conference on Computational Biology**, Brisbane, Australia, November 2023.

16. Xiao Y, Ibrahim M, and Ganapathiraju MK. Classical and Modern Language Modeling Techniques for Transmembrane Helix Prediction.
Intelligent Systems for Molecular Biology, Montreal, ON, Canada, 2024.

NON-PEERED REVIEWED PUBLICATIONS:

1. Sundaravadivel P, Kougianos E, Mohanty SP, Ganapathiraju MK.
Everything You Wanted to Know about Smart Health Care: Evaluating the Different Technologies and Components of the Internet of Things for Better Health.
IEEE Consumer Electronics Magazine. 2018 Jan;7(1):18-28.
doi: 10.1109/MCE.2017.2755378.

2. Thapliyal H, Michael K, Mohanty SP, Srinivas MB, Ganapathiraju MK.
Consumer Technology-Based Solutions for COVID-19 (Editorial)
IEEE Consumer Electronics Magazine. 2021 Feb 4;10(2):64-5.

THESIS AND REPORTS

1. Ganapathiraju MK**.** Speech Recognition on MPEG/Audio. **M. Egg. Thesis**, Indian Institute of Science. 1998.

2. Ganapathiraju MK, Carbonell J. Relevance of Cluster Size in MMR Summarization Class Report with 15+ citations. Carnegie Mellon University, Pittsburgh, PA. 2002.
3. Ganapathiraju MK. Application of Language Technologies to Biology: Feature Recognition and Modeling for Transmembrane Helix Prediction, **PhD Thesis**, Carnegie Mellon University, CMU-LTI-07-004. 2007.

INVITED TALKS

1. Bioinformatics – or Convergenetix? Centre for Development of Advanced Computing (C-DAC); India. 2005.
2. Discovery of human protein-protein interactions using machine learning. Dublin City University. Dublin, Ireland. 2011.
3. Computational Discovery of Human Interactome. Indian Institute of Technology, Hyderabad, AP, India. 2012.
4. Large Scale Data Analytics in Computational Systems Biology. Indo-US Collaborative Workshop on Large Scale Data Analytics and Intelligent Services. Bangalore, India. 2012.
5. Neuropsychiatric interactome prediction. Brain Research Session, IISc Global Alumni Conference, Chicago, USA. 2013.
6. Study of neuropsychiatric diseases through predicted protein-protein interactions. Presented at: International Conference on Computational Intelligence; 2014 Dec 27-28; Visakhapatnam, AP, India. 2014.
7. Plenary Talk: Discovery of Human Interactome. Presented at: 13th International Conference on Information Technology; 2014 Dec 22-24; Bhubaneswar, India. 2014.
8. Pitt's Science 2016: Schizophrenia Interactome Discovery and Dissemination. 2016.
9. Plenary Talk: Fourth Paradigm Conference: From Data to Discovery. Indian Institute of Science Education and Research (IISER), Bhopal, India. Jan 27-30, 2020.
10. Invited Talk: Indian Institute of Science American Medical Informatics Association Early Career Sunday Seminars, Online, 22 Nov, 2020.
11. Overcoming healthcare challenges by means of technology: can we prevent future pandemics? ZINC 2021: Zooming Innovation in Consumer Technologies International Conference, Novi Sad, Serbia, 27 May 2021.
12. Invited Talk: Artificial Intelligence: Advances in Speech, Language, Biology and Medicine, Diya Research Featured Speaker Series, Online, July 25, 2021.
13. Keynote Talk: The 22nd International Conference on Bioinformatics, Special Summit on Education and Training in Bioinformatics, Brisbane, Australia, Nov 12-15, 2023

PROFESSIONAL ACTIVITIES

TEACHING

Graduate Student Teaching

Year	Course	Title	Role
2005 (?)	-	Molecular Biophysics	Teaching Assistant
2004	-	Research Projects in Comp. Biology	Director and Faculty
2008	BIOINF 2011	Introduction to Biomedical Informatics	Faculty
2009	BIOINF 2051	Introduction to Bioinformatics	Faculty
2010	BIOINF2015	Mathematical Foundations	Faculty
2010	BIOINF 2116	Algorithms for Computational and Predictive Biomedicine	Faculty
2012	BIOINF 2051	Introduction to Bioinformatics	Faculty
2012	BIOINF 2012	Problem-Oriented Programming	Faculty
2012	BIOINF 2016	Translational Informatics	Director and Lecturer
2013	BIOINF 2051	Foundations of Bioinformatics	Faculty
2013	BIOINF 2012	Problem Oriented Programming	Faculty
2013	BIOINF 2132	Special Topic: Grantsmanship	Faculty
2014	BIOINF 2119	Probabilistic Methods in Artifical Intelligence	Faculty
2015	BIOINF 2051	Foundations of Bioinformatics	Faculty
2015	BIOINF 2119	Probabilistic Methods in Artifical Intelligence	Faculty
2016	BIOINF 2119	Probabilistic Methods in Artifical Intelligence	Faculty
2017	BIOINF 2119	Probabilistic Methods in Artifical Intelligence	Faculty
2017	BIOINF 2174	Foundations of Translational Bioinformatics	Director & Lecturer
2017	BIOINF 2051	Foundations of Bioinformatics	Director & Lecturer
2018	BIOINF 2051	Foundations of Bioinformatics	Lecturer
2019	BIOINF 2174	Foundations of Translational Bioinformatics	Director & Lecturer
2019	BIOINF 2070	Foundations of Biomedical Informatics – I	Lecturer
2019	IITP01	Artificial Intelligence: Knowledge Representation & Problem Solving	Director and Lecturer
2020	BIOINF 2071	Foundations of Biomedical Informatics – II	Director and Lecturer

2020	IITP01	Artificial Intelligence: Knowledge Representation & Problem Solving	Director and Lecturer
2020	BIOINF 2070	Foundations of Biomedical Informatics – I	Lecturer
2021	BIOINF 2071	Foundations of Biomedical Informatics – II	Director and Lecturer
2024	BIOINF 2026	Foundations of Algorithms	Director and Lecturer
2025	BIOINF 2026	Foundations of Algorithms	Director and Lecturer

UNDERGRADUATE STUDENT TEACHING

2022 Fall	02251	Great Ideas in Computational Biology	Director and Lecturer
2022 Fall	15112	Fundamentals of Programming and Computer Science	Lecturer
2023 Spring	02250	Introduction to Computational Biology	Director and Lecturer
2023 Spring	15110	Principles of Computing	Codirector & Lecturer
2023 Fall	15110	Principles of Computing	Codirector & Lecturer
2024 Spring	02251	Great Ideas in Computational Biology	Director and Lecturer
2024 Spring	02250	Introduction to Computational Biology	Director and Lecturer

Lectures for High School Students (UPCI Summer Academy)

Year	Program	Title	Role
2013	CoSBBI	Introduction to Protein Interactions	Faculty
2013	CoSBBI	Programming Fundamentals	Faculty
2014	CoSBBI	Introduction to Protein Interactions	Faculty

RESEARCH MENTORING AND ADVISING

Postdoctoral Associates/Scholars

Year	Name	Role	Where they are now
2013	Usha Kuppuswamy	Primary Advisor	MindSpec/5AM solutions
2013-2014	Sandeep Singhal	Primary Advisor	Cancer Res. Inst. of Northern Alberta
2014-2016	Vijayalakshmi Avali	Primary Advisor	Cognizant Solutions

Doctoral Students

Year	Name	Role	Where they are now
2008-2010	Heather Piwowar	Thesis Committee	ImpactStory (Cofounder)
2010-2013	Chad Kimmel	Thesis Committee	Wright Patterson Air Force Base

2010-2013	Kevin McDade	Thesis Committee	
2011-2012	Usha Kuppuswamy	Thesis Committee	Continued as postdoc
2016	Khushboo Thaker	Primary Advisor	
2017-2022	Brandan Dunham	Primary Advisor	
2017-2021	Kylia Williams	Thesis Committee	
2017-2022	Kalyani B. Karunakaran	Research Mentor	
2020-Now	Jon. Klonowski	Thesis Committee	

Master's Students

Year	Name	Role	Where they are now
2008-2009	Asia D. Mitchell	Research Advisor	Oregon Health & Sci Univ
2008-2010	Thahir P. Mohamed	Research Advisor	Amazon
2009	Chad Kimmel	Thesis Committee	Continued as PhD student
2009-2010	H. Osmanbeyogulu	Research Advisor	DBMI Faculty
2009-2012	S. Ananthasub.	Research Advisor	Google
2011-2013	Naoki Orii	Research Advisor	Groupon
2011-2012	Tarum Sharma	Research Advisor	Microsoft
2011-2012	Anish B. Chakka	Research Advisor	
2012-2014	Suyoun Kim	Research Advisor	CMU
2012-2013	Lav. Viswanathan	Research Advisor	Yahoo!
2013-2015	Adam Roth	Research Advisor	HealthStratica
2013-2015	Hoahan Wang	Research Advisor	PhD student, CMU
2013-2015	Adam Handen	Research Advisor	Systems Programmer at Pitt
2014-2015	Aman Gupta	Research Advisor	PhD student, CMU
2014-2016	S. Subramanian	Research Advisor	PhD student, Canada
2015-2016	Varshar Embar	Research Advisor	MindMeld
2017	Sai S. Varanasi	Sys. Dev. Mentor	
2017	Chandramouli Ratnam	Thesis Committee	Univ. of Pittsburgh
2017	Anand Varanasi	Sys. Dev. Mentor	Moderna
2017	Tiffany Carruthers	Sys. Dev. Mentor	Innovu
2018	Pooja Ghatge	Sys. Dev. Mentor	Teletracking

2019	Ryan Hausler	Member of Thesis	Univ of Pennsylvania
2020-2021	American Eagle	Saetbyul Lee	Sys. Dev. Mentor
2020-2021	Xueming Yang	Sys. Dev. Mentor	Amazon
2025-2026	Manikya Rathna	Research Advisor	

Graduate and Undergraduate Interns

Year	Name
2005	Prashanth Balajapalli, Phanindra Pydimarri
2009	Robert T. McLaughlin, Gabriel Ekemezie, Anna Stuphen, Rohini Sinha, S. Sriram, Naved Siddiqui, Davashish Ghosh, Geet Garg, Yanli Wang
2010	Isaac Haddad, Sean Myers, John M., Joshua Hunsberger, John Hofricther, Aaron Seckar, Adam Handen, Jessica Wehner
2013	Shelly A. Goldberg, Apoorva Kandakatla, Anis Adnani, Ellie C. Beam, Jennifer E. Ten Eyck
2014	Helen Li, Maysum Chaudri, Daniel Hui, Molly E. Johnson, Vasil Mico
2016	Josefina Correa, Mara Staines
2019	Amrita Reddy
2020	Prakriti Sreshta
2021	Richa Desai (co-advised by Dr. Yalini Senathirajah)
2021	Rohini Das (computer science), Vellore Institute of Technology, Vellore, India. Research Mentor.
2021-2022	George Rivera (nursing), Nueva Ecija University of Science and Technology, Philippines. Research Mentor.
2021-2022	Madhura Sen (computer science), Vellore Institute of Technology, Vellore, India. Research Mentor.
2022	Xingyi Yang (computational biology), University of Pittsburgh. Research Mentor.
2022	Harish Kodavali (computational biology), University of Pittsburgh. Research Mentor.
2022-2024	Jingxiang (Eric) Gao (computer science), Carnegie Mellon University in Qatar. Research Mentor.
2023-2024	Malak Ibrahim (computer science), Carnegie Mellon University in Qatar. Independent-Study Guide.
2023	Xiaoqi Huang (computer science), Carnegie Mellon University in Qatar. Research Mentor.
2023-2024	Adan Jawad (computer science), Carnegie Mellon University in Qatar. Independent-Study Guide.

2023-2024	Adel Fergatova (biological science), Carnegie Mellon University in Qatar. Independent-Study Guide.
2024	Mounika Kavuri, CMU MS in Quantitative and Computational Biology, Independent-Study Guide.
2025	Anirudh Rajesh, Pitt SCI Undergraduate Student. Independent-Study Guide.

High School Students

Year	Name
2008	Adam Handen
2011	Emily Cocco
2013	Sophia Cheng, Ritwik Gupta, Tonya Hammond
2014	Thomas Nash
2015	Violet Turri
2017	Brian Kang
2018	Hailey Snodgrass and Jasmine Blank
2020	Srikar Siripuram, Sancharita Ramji
2021	Srivatsa Bellamkonda
2021	Sahana Mohan
2022-23	Unnati Seshadri
2025	Asher Peng
2025	Zeenia Pirani
2025	Kavinaya Murali

RESEARCH

Current Grant Support:

Grant Number:	5U24OH009077
Funding Source:	National Institute for Occupational Safety and Health (NIOSH), CDC
Grant Title:	National Mesothelioma Virtual Bank, Continued Innovation
Role in Project:	Co-I (PI Becich and Dacic)
Effort:	12.5%
Years Inclusive:	11/15/2024-08/25/2025
Source Amount:	$12,127

Pending Grant Support:

None

Prior Grant Support:

Grant Number: 612571
Funding Source: Mesothelioma Applied Research Foundation
Grant Title: Genetic Variants, Pathways and Drug Targets of Peritoneal Mesothelioma
Role in Project: MPI
Years Inclusive: 1/1/2019-12/31/2020 (NCE 06/30/2021)
Source Amount: $100,000

Grant Number: 18T-003
Funding Source: Stanley Medical Research Institute
Grant Title: Chromoglycate adjunctive therapy for patients with schizophrenia
Role in Project: Co-I (PI Nimgaonkar)
% Effort: <1%
Years Inclusive: 2/1/2019-8/31/2022
Source Amount: $691,824

Grant Number: n/a
Funding Source: Stanley Medical Research Institute
Grant Title: A Randomized Controlled Trial of Acetazolamide for Patients with Treatment Resistant Schizophrenia
Role in Project: Honorary Consultant (PI Nimgaonkar)
% Effort: <1%
Years Inclusive: 8/1/2019-8/31/2021
Source Amount: $685,449

Grant Number: 1R01MH094564-01
Funding Source: NIH (NIMH)
Grant Title: Discovery of Mental Health and Inflammation (MHAIN) Interactome
Role in Project: PI
Effort: 50-90% Calendar Months
Years Inclusive: 8/1/11 - 4/30/16 (No-cost extension until 8/31/17
Source Amount: $1,790,000

Grant Number: 3R01MH094564-02S2
Funding Source: NIH (NIMH)
Grant Title: Discovery of Mental Health and Inflammation (MHAIN) Interactome
Role in Project: PI
Effort: 0% (PI effort covered on parent grant)
Years Inclusive: 7/19/12 - 4/30/13/31/17
Source Amount: $144,539

Grant Number: 5U24OH009077-11
Funding Source: National Institute for Occupational Safety and Health (NIOSH), CDC

Grant Title:	National Mesothelioma Virtual Bank, Continued Innovation
Role in Project:	Co-I (PI Becich)
Effort:	30% & 64%
Years Inclusive:	9/1/2017-12/31/2018 & 02/01/2021 - present
Source Amount:	

Grant Reviewer

2013	Reviewer of BRAINS grants: Special Emphasis Panel: ZMH1 ERB-L(04), NIMH BRAINS: Biobehavioral Research Awards for Innovative New Scientists
2013	Reviewer of EUREKA grants: Special Emphasis Panel ZMH1 ERB-M(07), NIMH EUREKA: Exceptional Unconventional Research Enabling Knowledge Acceleration
2014	Reviewer of EUREKA grants: Special Emphasis Panel ZMH1 ERB-R (02), NIMH EUREKA: Exceptional Unconventional Research Enabling Knowledge Acceleration
2014	Reviewer of BRAIN Initiative grants: Special Emphasis Panel ZMH1-ERB-M(06), NIMH BRAIN Initiative: Brain Research through Advancing Innovative Neurotechnologies
2017	Reviewer for EBIT Study Section: Adhoc reviewer EBIT: Enabling Bioanalytical and Imaging Technologies
2017	Reviewer for CTD Network grants: Special Emphasis Panel ZCA1-SRB-2-M1, NCI CTD Network: Cancer Target Discovery and Development Network (U01s)
2019	Reviewer for Spaulding Rehabilitation Hospital Accelerator Program Proposal Consortia for Improving Medicine with Innovation and Technology (CIMIT)
2019	Reviewer for Hillman Developmental Funding Program Proposals UPMC Hillman Cancer Center
2020-25	Reviewer for Mesothelioma Applied Research Foundation Grant Proposals (SAB member)

Editorial Boards and Conference Program Committees

2012	AMIA Translational Bioinformatics Summit, San Francisco, CA Session Chair Disease Informatics Session
2012	Great Lakes Bioinformatics Conference, Ann Arbor, MI Session Chair Protein Interaction and Molecular Networks, Metagenomics Session
2013	Great Lakes Bioinformatics Conference, Pittsburgh, PA
2013	Indian Institute of Science Alumni Global Conference, Chicago, IL Track Chair Advancement of Mental Health Research Track
2015	International Symposium on Nanoelectronic and Information Systems, Indore, India Track Chair Cyber Physical Systems and Social Networks Track

2016	2nd IEEE International Symposium on Nanoelectronic and Information, Gwalior, India
2016	Program Chair International Conference on Information Technology, Bhubaneswar, India
2016 – 2019	Editorial Board Member, IEEE Consumer Electronics Magazine
2017	Program Chair International Conference on Information Technology, Bhubaneswar, India
2020	Consumer Technology-Based Solutions for COVID-19, Special Section, IEEE Consumer Electronics Magazine, 2020
2021-	Associate Editor, *Translational Systems Biology and In Silico Trials* section in *Frontiers in Systems Biology* journal

SERVICE

University Committees

2019 – 2022	Member, Conflict of Interest Committee, Pitt

Department Colloquium

Spring 2017 to Fall 2019	Director of Department of Biomedical Informatics Seminar Series

Department Committees

2008 - 2022	Member, Curriculum Committee, Department of Biomedical Informatics (DBMI) Pitt
2008 - 2022	Member, Admissions Committee, DBMI
2008 - 2014	Member, Admissions Committee, The Intelligent Systems Program (ISP) Pitt
2009 - 2010	Member, Diversity Liaison
2014 - 2015	Member, Curriculum committee Integrative Systems Biology (ISB) Pitt
2020-2022	Committee for Comprehensive Evaluation of 2nd Year Ph.D. Students (DBMI) Pitt
2021-2022	Diversity, Equity and Inclusion Committee
2017-2019 & 2021	Director of Department of Biomedical Informatics Seminar Series
2024-	Member, Curriculum Committee, DBMI
2025-	Member, Preliminary Examination Committee, DBMI

CARNEGIE MELLON UNIVERSITY, QATAR

2023	Meeting of the Minds Abstract and Poster review
2022 – 2024	Research Experiences Committee Member

LIST of CURRENT RESEARCH INTERESTS

My research focuses on discovering the molecular mechanisms by which genes contribute to human disease and on disseminating these discoveries as actionable hypotheses for experimental biologists, thereby accelerating biological discovery. More broadly, I develop computational methods and machine-learning algorithms to address fundamental problems in molecular and biomedical sciences.

My recent and ongoing work spans several interconnected areas:

- **Computational discovery and prioritization of protein–protein interactions** (PPIs): Development of machine-learning algorithms for large-scale prediction of PPIs and translation of these predictions into biomedical insights.
- **Biomedical knowledge delivery and open science infrastructure**: Creation of web-based platforms that present “the right information in the right formats” to biologists, along with systems that support crowdsourced knowledge creation through gamification, nanopublications, and micro-attributions.
- **Inference analytics for translational prioritization**: Algorithms to systematically rank computational predictions based on their predicted mechanistic and biomedical impact.
- **Applications to disease biology**: Integration of these methods to study developmental disorders, neuropsychiatric disorders, rare diseases, and other disease clusters.

I am currently developing Generative AI agents for biologists, designed to aid in the interpretation of individual PPIs within functional, pathway, and disease contexts.

In parallel, I have entered the domain of clinical informatics and computational phenotyping, with ongoing efforts in rehabilitation medicine and long-term plans to generalize these techniques into broader algorithmic frameworks.

Building on my earlier work on n-gram analysis of proteome and genome sequences, I am developing computational approaches to identify disease-associated genomic patterns, specifically, tandem repeats, palindromes and inverted repeats.

Finally, drawing on my background in electronics and communications engineering, together with my expertise in biomedical informatics, I collaborate on projects in consumer health technologies and the Internet of Medical Things (IoT/IoMT) to advance individual and community health applications.

My research focus is on the discovery of molecular mechanisms by which genes play a role in disease, and dissemination of such discoveries as hypotheses to experimental biologists so that the biological discovery can be carried out at accelerated pace. More generally, my interest lies in developing applications and algorithms employing machine learning and computer and information technologies to solve relevant problems in molecular biology. Recent and ongoing work involves: (a) development of machine learning algorithms on large data sets to predict protein-protein interaction and to prioritize their translation to biomedical science, (b) development of web-based applications to presents “right information in right formats” to biologists and for the creation of Open Science Network to involve scientists in crowdsourcing for knowledge creation; to develop strategies involving gamification, nanopublications and microattributions to recruit and engage scientists for participating in the open science network, (c) development of inference analytics algorithms to prioritize translation of computational predictions based on their predicted impact on biomedical science. I am applying these methods to the study of various clustered disorders from developmental disorders to neuropsychiatric disorders as well as rare diseases.

I am currently researching Generative AI agents for biologists to aid in the interpretation of individual protein-protein interactions in relation to functional and disease relationships.

I recently started working in the domain of clinical informatics broadly, and computational phenotyping more specifically. Current efforts in applying this to rehab domain, but with the goal to expand this into more generic algorithms research.

Building upon highly successful methods that I developed earlier, called n-gram analysis of proteome and genome sequences, I am working on developing computational and bioinformatics methods to discover disease-associated genome patterns and protein variants.

Building on my unique background in electronics & communications engineering and my current position in biomedical informatics, I collaborate in the area of consumer electronics to develop individual/community health applications via internet of medical things (IoT/IoMT).