SOUMYA BANERJEE

PUBLICATIONS

The top five papers are presented first.

Refereed Journal Papers

1) A class-contrastive human-interpretable machine learning approach to predict mortality in severe mental illness, S. Banerjee, P. Lio, P. Jones, R. Cardinal, *Nature Partner Journal Schizophrenia*, 7, 60, 2021 * (*Nature publishing group, Impact Factor = 6.3*)

I developed an explainable machine learning technique to predict mortality. This was applied to data from hospital electronic healthcare records. I worked closely with clinicians to develop this model.

2) Optogenetic tuning reveals Rho amplification-dependent dynamics of a cell contraction signal network, D. Kamps, J. Koch, V. Juma, E. Campillo, M. Graessl, S. Banerjee, T. Mazel, X. Chen, Y. Wu, S. Portet, A. Madzvamuse, P. Nalbant, L. Dehmelt, *Cell Reports*, 33(9):108467, 2020 (*Cell Press publishing group*, Impact Factor = 8.1)

3) Deconvolution of monocyte responses in inflammatory bowel disease reveals an IL-1 cytokine network that regulates IL-23 in genetic and acquired IL-10 resistance, D. Aschenbrenner, M. Quaranta, S. Banerjee, et al. *Gut,* 2020 (*British Medical Journal publishing group*, Impact Factor = 19.8)

The work integrates clinical data with genomic information to predict if patients would respond to therapy. My role was leading the computational effort and liaising with clinicians.

4) Hydroxychloroquine: balancing the needs of LMICs during the COVID-19 pandemic, S. Banerjee, *Lancet Rheumatology*, 2(7):385-386, 2020

The work analyses the demand surge for hydroxychloroquine and the effect it may have on patients in developing nations.

4) Influence of correlated antigen presentation on T cell negative selection in the thymus, S. Banerjee, S.J. Chapman, *Journal of the Royal Society Interface*, 15(148), 20180311, 2018 (Impact Factor = 4.3) *

I built a computer model that integrates genomic data on how the immune system is trained to recognize pathogens. I liaised with biologists and led the computational work.

5) Modelling the effects of phylogeny and body size on within-host pathogen replication and immune response, S. Banerjee, A. Perelson, M. Moses, *Journal of the Royal Society Interface*, 14(136), 20170479, 2017 (Impact Factor = 4.3) *

6) Towards a Quantitative Understanding of Within Host Dynamics of West Nile Virus Infection, S. Banerjee, J. Guedj, R. Ribeiro, M. Moses & A. Perelson, *Journal of the Royal Society Interface*, 13(117), 20160130, 2016 (Impact Factor = 4.3) *

7) Predictive metabolomic profiling of microbial communities using amplicon or metagenomic sequences, H. Mallick, E. Franzosa, L. McIver, S. Banerjee, et al., *Nature Communications*, 10(1):3136, 2019 (Impact Factor = 11.8) *

This paper integrates clinical data with genomic data on the gut microbiome. I liaised with clinicians, experimentalists and industry experts and built the first draft of the machine learning model.

8) Patient and public involvement to build trust in artificial intelligence: a framework, tools and case studies, S.Banerjee, P. Alsop, L. Jones, R. Cardinal, *Patterns*, 3(6):100506, 2022
(*Cell Press publishing group*)

9) An excitable Rho GTPase signaling network generates dynamic subcellular contraction patterns, M. Graessl, J. Koch, A. Calderon, S. Banerjee, T. Mazel, N. Schulze, J. Jungkurth, A. Koseska, L. Dehmelt, P. Nalbant, *Journal of Cell Biology*, 216(12), 4271-4285, 2017 (Impact Factor = 9.7)

10) Involving patients in artificial intelligence research to build trustworthy systems, S. Banerjee, S. Griffiths, *AI & Society*, 2023

11) Software Application Profile: ShinyDataSHIELD—an R Shiny application to perform federated non-disclosive data analysis in multicohort studies, X. Escribà-Montagut, Y. Marcon, D. Avraam, S. Banerjee, T. Bishop, P. Burton, J. González, *International Journal of Epidemiology,* dyac201, 2022
(*Oxford University Publishing Group, Impact Factor 9.8*)

12) dsSynthetic: Synthetic data generation for the DataSHIELD federated analysis system, S.Banerjee, T. Bishop, *BMC Research Notes*, 15(1):230, 2022

13) dsSurvival: Privacy preserving survival models for federated meta-analysis of clinical data, S.Banerjee, et al, *BMC Research Notes*, 15(1):197, 2022

14) The early impact of COVID-19 on mental health and community physical health services and their patients' mortality in Cambridgeshire and Peterborough, UK, S. Chen, P. Jones, B. Underwood, A. Moore, E. Bullmore, S. Banerjee, et al., *Journal of Psychiatric Research*, 131, 244-254, 2020 (Impact factor = 4.4)

15) A spatial model of the efficiency of T cell search in the influenza infected lung, D. Levin, S. Forrest, S. Banerjee, M. Moses & F. Koster, *Journal of Theoretical Biology*, 398(7), 52-63, 2016 (Impact Factor = 2.2)

16) Competitive dynamics between criminals and law enforcement explains the super-linear scaling of crime in societies, S. Banerjee, Hentenryck, P.V. & Cebrian, M. *Palgrave Communications*, 1(1), 15022, 2015 (Nature Publishing Group)

I worked with a social-scientist to understand why per-capita crime is higher in bigger cities. I collected the data, interacted with the social scientist and built the model.

17) A bioorthogonal small-molecule switch system for controlling protein function in cells, P. Liu, A. Calderon, G. Konstantinidis, J. Hou, S. Voss, X. Chen, F. Li, S. Banerjee, J. Hoffmann, C. Theiss, L. Dehmelt & Y. Wu, *Angewandte Chemie*, 53(38), 10049-10055, 2014 (Impact Factor = 13.7)

18) Science and technology consortia in US biomedical research: A paradigm shift in response to unsustainable academic growth, Curt Balch, Hugo Arias-Pulido, S. Banerjee, Alex K. Lancaster, Kevin B. Clark, Michael Perilstein, Brian Hawkins, John Rhodes, Piotr Sliz, Jon Wilkins and Thomas W. Chittenden, *BioEssays*, 37(2), 119-122, 2014 (Impact Factor = 5.4)

19) Scale Invariance of Immune System Response Rates and Times: Perspectives on Immune System Architecture and Implications for Artificial Immune Systems, S. Banerjee & M. Moses, *Swarm Intelligence*, 4(4), 301-308, 2010 (Impact Factor = 2.1)

Refereed Conference Papers

NOTE: In my parent discipline (Computer Science), people submit to conferences and conferences are peer-reviewed

1) Analysis of a Planetary Scale Scientific Collaboration Dataset Reveals Novel Patterns, S. Banerjee, *Proceedings of the Complex Systems Digital Campus 2015 – World e-Conference, Conference on Complex Systems,* 2016 (peer-reviewed conference)
2) A Multi-Agent System Approach to Load-Balancing and Resource Allocation for Distributed Computing, S. Banerjee and J. Hecker, *Proceedings of the Complex Systems Digital Campus 2015 – World e-Conference, Conference on Complex Systems*, 2016 (peer-reviewed conference)

3) Computationally Simulating Intermodal Terminal Attractiveness and Demand, S. Banerjee et al., *Proceedings of the 23rd World Congress on Intelligent Transport Systems*, 2016
I worked with companies and built a model that predicts demand for logistics and supply chains.

4) Analysis of Demand and Operations of Intermodal Terminals, R. Garcia-Flores, S. Banerjee et al., *Proceedings of the 24th National Conference of the Australian Society for Operations Research*, 2016
5) Forecasting in the era of Big Data: Lessons and Pitfalls, Y. Tyshetskiy, S. Banerjee et al., *Proceedings of the Annual Conference of the International Association of Maritime Economists*, 2016
6) The Value of Inflammatory Signals in Adaptive Immune Responses, S. Banerjee, D. Levin, M. Moses, F. Koster & S. Forrest, *The 10th International Conference on Artificial Immune Systems (ICARIS)*, Lecture Notes in Computer Science, Volume 6825/2011, 1-14, 2011
7) Biologically Inspired Design Principles for Scalable, Robust, Adaptive, Decentralized Search and Automated Response (RADAR), M. Moses & S. Banerjee, *Proceedings of the 2011 IEEE Conference on Artificial Life*, 30-37, 2011
8) Modular RADAR: An Immune System Inspired Search and Response Strategy for Distributed Systems, S. Banerjee & M. Moses, *The 9th International Conference on Artificial Immune Systems (ICARIS)*, Lecture Notes in Computer Science, Volume 6209/2010, 116-129, 2010
9) A Hybrid Agent Based and Differential Equation Model of Body Size Effects on Pathogen Replication and Immune System Response, S. Banerjee & M. Moses, *The 8th International Conference on Artificial Immune Systems (ICARIS)*, Volume 5666-014, 2009

Refereed Book Chapters

Using Optimisation and Machine Learning to Validate the Value of Infrastructure Investments, R. Garcia-Flores, S. Banerjee, G. Mathews (2016) Book chapter in *Infrastructure Investments: Politics, Barriers and Economic Consequences*