Abhimanyu Pallavi Sudhir

AI researcher working on program markets in the context of AI and bounded rationality.

Formal education

- University of Warwick · PhD Computer Science · 2022-26 – supervisor: Long-Tran-Thanh
- Imperial College London · MSci Mathematics · 2018-22 – 1st class honors

Internships

- Goldman Sachs · AI Research Intern · Jan-Aug 2021, London – Developed and implemented novel methods in NLP and recurrent neural networks for financial forecasting

Research

Markets and AI (PhD work)

My current work focuses on building an algorithmic model of market dynamics to design AI agents with a market-based structure, and developing prediction market mechanisms to elicit beliefs about latent space variables to boost interpretability.

- Abhimanyu Pallavi Sudhir and Long-Tran Thanh (2024), "Betting on what is neither verifiable nor falsifiable", arxiv.org/abs/2402.14021
- Abhimanyu Pallavi Sudhir (2021), "A mathematical definition of property rights in a Debreu economy", arxiv.org/abs/2107.09651

> *Related write-ups and talks.*
>
> — LessWrong post (2023): "Betting on what is un-falsifiable and un-verifiable"
>
> — Poster at the Co-operative AI Foundation (CAIF) summer workshop, 2023: abhimanyu.io/legacy_writing/PhD_presentations/caif.pdf
>
> — LessWrong post (2022): "Meaningful things are those the universe possesses a semantics for"

Consistency checks and forecasting (Berkeley SPAR – spring 2024)

Ongoing collaboration with an ETH Zurich team supervised by Daniel Paleka to develop a consistency benchmark for LLM forecasters, as part of the Berkeley Supervised Program for Alignment Research.

General mathematics (Undergraduate work and prior)

- Abhimanyu Pallavi Sudhir (2019), "Infinitesimal translations and a multivariate Grünwald-Letnikov calculus", arxiv.org/abs/1904.02710
- Abhimanyu Pallavi Sudhir (2019), "Generalisations of the determinant to interdimensional transformations: a review," arxiv.org/abs/1904.08097
- Abhimanyu Pallavi Sudhir (2018), "The generalized Cauchy derivative as a principal value of the Grünwald-Letnikov fractional derivative for divergent expansions," arxiv.org/abs/1809.08051
- Abhimanyu Pallavi Sudhir (2014), "On the Determinant-like function and the Vector Determinant," *Advances in Applied Clifford Algebras* (24-3: 805-807), doi:10.1007/s00006-014-0455-3
- Abhimanyu Pallavi Sudhir (2013), "Defining the Determinant-like function for m by n matrices using the exterior algebra," *Advances in Applied Clifford Algebras* (23-4: 787-792), doi:10.1007/s00006-013-0416-2

Academic service

- *Teaching Assistant for CS141: Functional Programming (Warwick)* · 2023
- *Reviewer for Advances in Applied Clifford Algebras (Springer)* · 2020

Courses and workshops attended

- *Co-operative AI Foundation* · Jul 2023 · workshop on AI and cooperative game theory

Other projects

Equivariant learning (2021-22)

Final-year MSci project with Professor Jeroen Lamb at Imperial College London exploring equivariant learning and causal DAGs.

Report: abhimanyu.io/legacy_writing/Imperial_reports/m4r.pdf

Lie theory (2019)

Undergraduate research project with Professor Richard Thomas at Imperial College London on Lie groups and algebras.

Report: abhimanyu.io/legacy_writing/Imperial_reports/urop.pdf
Presentation: abhimanyu.io/legacy_writing/Imperial_presentations/lie_theory.pdf

Lean (2018-19)

Computerized formal proving in Lean with Professor Kevin Buzzard at Imperial College London.

- Wrote the FilterProduct.lean and Hyperreal.lean modules for the Lean math library
- Formalized the first-year "Foundations of Analysis" module exam Blog post: xenaproject.wordpress.com/2019/05/06/m1f-imperial-undergraduates-and-lean/

PhysicsOverflow (2014-15)

Co-founded PhysicsOverflow, a postgraduate-level physics Q&A site and open peer review system. See en.wikipedia.org/wiki/PhysicsOverflow for more details.

- Abhimanyu Pallavi Sudhir and Rahel Knoepfel (2015), "PhysicsOverflow: A postgraduate-level physics Q&A site and open peer review system," *Asia-Pacific Physics Newsletter* (4-1: 53-55), doi:10.1142/S2251158X15000193

Links

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- Website: abhimanyu.io
- Blog: TheWindingNumber.blogspot.com
- Google Scholar: scholar.google.com/citations?user=lb38BjYAAAAJ
- Github: github.com/abhimanyupallavisudhir
- LessWrong: lesswrong.com/users/abhimanyu-pallavi-sudhir