**Abhimanyu Pallavi Sudhir**

# Formal education

* University of Warwick PhD Computer Science 2022-26 – supervisor: Long-Tran-Thanh
* Imperial College London Undergraduate Masters (MSci) Math 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 primary work focuses on topics at the intersection of markets and AI, especially AI alignment.

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

*Related write-ups and talks.*

* Lesswrong post (2024): [“Reinforcement learning from market feedback, and other uses of information markets”](https://www.lesswrong.com/posts/Y79tkWhvHi8GgLN2q/reinforcement-learning-from-market-feedback-and-other-uses)
* LessWrong post (2023): [“Betting on what is un-falsifiable and un-verifiable”](https://www.lesswrong.com/posts/id84oe3LxdzoqinKA/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](https://abhimanyu.io/legacy_writing/PhD_presentations/caif.pdf)
* LessWrong post (2022): [“Meaningful things are those the universe possesses a semantics for”](https://www.lesswrong.com/posts/xqxXrAohXSD3akYCg/meaningful-things-are-those-the-universe-possesses-a)

## Consistency checks and forecasting (2024)

Developed a Consistency Benchmark for LLM forecasters, along with a principled arbitrage-based metric for inconsistency and a novel consistency calibration method similar to Platt scaling.

* Abhimanyu Pallavi Sudhir\*, Alejandro Alvarez, Adam Shen, and Daniel Paleka\* (2024), “Consistency Checks for Language Model Forecasters” *Workshop paper, accepted to:* Agentic Markets Workshop at ICML 2024; NextGenAISafety Workshop at ICML 2024; Oxford ELLIS Robust LLMs Workshop 2024

## Scalable Oversight Benchmark (2024)

Ongoing collaboration with a team supervised by Arjun Panickssery and Nina Rimsky, to develop a comprehensive benchmark for Scalable Oversight protocols.

## General mathematics (Undergraduate work and prior)

* Abhimanyu Pallavi Sudhir (2019), “Infinitesimal translations and a multivariate Grünwald-Letnikov calculus”, [arxiv.org/abs/1904.02710](https://arxiv.org/abs/1904.02710)
* Abhimanyu Pallavi Sudhir (2019), “Generalisations of the determinant to interdimensional transformations: a review,” [arxiv.org/abs/1904.08097](https://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](https://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](https://link.springer.com/article/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](https://link.springer.com/article/10.1007/s00006-013-0416-2)

# Academic service

* *Teaching Assistant for CS255: Artificial Intelligence (Warwick)* 2024
* *Reviewer for NextGenAISafety Workshop at ICML 2024* 2024
* *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

## Costly (2024)

Wrote the Python package costly for estimating costs and running times of complex LLM workflows/experiments/pipelines in advance before spending money, via simulations.

Project page: [github.com/abhimanyupallavisudhir/costly](https://github.com/abhimanyupallavisudhir/costly)

Install: pip install costly

## 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](https://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](https://abhimanyu.io/legacy_writing/Imperial_reports/urop.pdf)

Presentation: [abhimanyu.io/legacy\_writing/Imperial\_presentations/lie\_theory.pdf](https://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](https://github.com/leanprover-community/mathlib4/blob/3a7e6bb77ec51d8009107923a4c071a9473ecc5c/Mathlib/Order/Filter/FilterProduct.lean) and [Hyperreal.lean](https://github.com/leanprover-community/mathlib4/blob/3a7e6bb77ec51d8009107923a4c071a9473ecc5c/Mathlib/Data/Real/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/](https://xenaproject.wordpress.com/2019/05/06/m1f-imperial-undergraduates-and-lean/)

## PhysicsOverflow (2014-15)

Co-founded [PhysicsOverflow](https://physicsoverflow.org), a postgraduate-level physics Q&A site and open peer review system. See [en.wikipedia.org/wiki/PhysicsOverflow](https://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](https://dx.doi.org/10.1142/S2251158X15000193)

## Links

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* Blog: [TheWindingNumber.blogspot.com](https://thewindingnumber.blogspot.com/)
* Google Scholar: [scholar.google.com/citations?user=lb38BjYAAAAJ](https://scholar.google.com/citations?user=lb38BjYAAAAJ&hl=en)
* Github: [github.com/abhimanyupallavisudhir](https://github.com/abhimanyupallavisudhir)
* LessWrong: [lesswrong.com/users/abhimanyu-pallavi-sudhir](https://www.lesswrong.com/users/abhimanyu-pallavi-sudhir)