Abhimanyu Pallavi Sudhir

AI and game theory researcher.

Formal

Education

- University of Warwick · PhD Computer Science · 2022-26 – supervisor: Long-Tran-Thanh
- Imperial College London · MSci Mathematics · 2018-22 – 1st class honors
- Dhirubhai Ambani International School, Mumbai · IB Diploma · 2013-18 – 44/45
- NUS High School, Singapore · 2012-13
- Bukit View Primary School, Singapore · 2006-11

Internships

- Goldman Sachs · AI Research Intern · Jan-Aug 2021
- Jane Street · Spring Week · 14-17 Apr 2020 – [cancelled due to COVID-19 lockdowns]
- Schroders · Spring Week · 12-13 Aug 2020 – [held virtually due to COVID-19 lockdowns]
- Jane Street · Fall Insight Day · 30 Oct 2018

Publications

AI and agent science

- Abhimanyu Pallavi Sudhir (2023), "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

General mathematics

- Abhimanyu Pallavi Sudhir (2019), "Infinitesimal translations and a multivariate Grünwald-Letnikov calculus", arxiv.org/abs/1904.02710
- 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 (2019), "Generalisations of the determinant to interdimensional transformations: a review," arxiv.org/abs/1904.08097
- ~~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 (2014), "On the Properties of the Determinant-like function," (presented at International Conferences on Mathematical Sciences, Chennai, July 17-19, 2014).~~
- ~~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~~
- ~~Abhimanyu Pallavi Sudhir (2012), "The Representation of Matrices in unit vector notation," *Journal of Mathematics Research* (4-4: 86-91), doi:10.5539/jmr.v4n4p86~~
- ~~All of the crank stuff I posted to PhysicsForums as a kid~~

Miscellaneous

- 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

Projects

Pet projects

- *The mind-killer* · 2022-present · Personal non-academic blog [Substack]
- *The Winding Number* · 2016-present · Personal academic blog; sample articles [1][2][3][4]

- *Co-founded PhyscisOverflow* · 2014-18 · [Website][Wikipedia]
- ~~*The Mathematics and Physics Encyclopedia* · 2010-14 · [Book][Wiki][Blog][YT channel]~~

Academic service

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

Write-ups and talks

- *Betting on what is not verifiable nor falsifiable* · 2023 · PhD
  - Annual Report [pdf]
  - Warwick Postgraduate colloquium (Dec 2023) & Warwick Cake Talk (Nov 2023) [ppt]
- *Bounded rationality and such* · 2022-23 · PhD
  - "Algorithmic information is at the root of all our problems", Warwick Postgraduate colloquium (Mar 2023) [ppt]
  - "Incompleteness theorems and firing philosophers", Warwick Cake Talk (Feb 2023) [ppt]
  - PhD proposal [pdf]
- *When does equivariant learning make sense?* · 2021-22 · final-year project with Jeroen Lamb
- *A mathematical definition of property rights* · 2021
  - Imperial Undergraduate Colloquium (Feb 2022)
  - Sheffield SIAM-IMA Applied Math Conference (July 2021) [ppt]
- *Local normal forms of analytical maps near fixed points* · 2020 · group report and presentation
- *Lie theory: the topology of groups* · 2019 · UROP reading project with Richard Thomas
  - Warwick-Imperial Autumn Meeting (Mar 2022) [cancelled due to COVID-19 lockdowns]
  - Imperial Undergraduate Colloquium (Oct 2019) [report][ppt]
  - Imperial 3-minute thesis competition (Oct 2019)
- *Ultraproducts and hyperreals* · 2018-19 · computerized formal proving with Kevin Buzzard
  - Files in the Lean math library on Github, ≈1500 loc [hyperreal][ultraproduct][germ]
  - Formalization of college math exams [announcement post]
  - Poster presentation (Jun 2019) [poster]
- *Fractional calculus* · 2017-19
  - IMA Tomorrow's Mathematicians Today IMA TMT (Feb 2019) [ppt]
  - Imperial Undergraduate Colloquium (Nov 2018)
- ~~*Generalized determinants* · 2012-19~~
  - ~~Intel ISEF (May 2015) + precursor rounds~~
  - ~~International Conference on Mathematical Sciences 2014 (Jul 2014)~~

Courses

- *Machine Learning and Applied Statistics* · Jul 2019 · summer course at Imperial College Business School; 7.5 ECTS, score: 97.5%

Awards

- Scholarships
  - Warwick PhD (2022-26) – departmental full scholarship
  - ICBS Machine Learning Summer course (2019) – departmental full scholarship
- Conferences and science fairs
  - IMA TMT, London (2019) – among 4 shortlisted for GCHQ prize
  - Intel ISEF, Pittsburgh (2015) – AMS Karl Menger Award
  - ~~International Conference on Mathematical Sciences 2014 – Best Paper Award~~

  - IRIS National Science Fair (2014) – Gold; Amul Top 3; GUJCOST Merit Award
  - IRIS National Science Fair (2013) – Silver; Special Physics Prize
- Problem-solving and olympiads
  - Imperial Mathematics Competition (2019) – nationwide finalist
  - IIT Math Olympiad (2017) – sixth place nationally in India
  - Regional Mathematical Olympiad (2016) – Merit
- Kid competitions
  - 2012 Bukit Panjang High School Mathematics and Science Challenge – Team 1st
  - 2012 American Mathematics Contest – Certificate of Achievement
  - 2012 Rio Tinto Science Contest – High Dist
  - 2011 Singapore Mathematical Olympiad Junior – Honorable Mention
  - 2011 Singapore Mathematical Olympiad for Primary Schools – Gold
  - 2011 Singapore and ASEAN Schools' Math Olympiad – Gold
  - 2011 Anglo-Chinese Young Whizzes' Challenge – Gold; Team Round – Team 2nd
  - 2011 River Valley Math Comp – Individual 1st; Team 1st; Team round – 2nd; Platinum
  - 2011 St. Andrew's Math and Science Comp – Individual 1st; Team 1st; Team round – 1st
  - 2011 Mathematical Olympiad Talent Quest – Bronze; Team Round – Team 3rd
  - 2011 Australian Mathematics Competition – High Dist
  - 2011 Rio Tinto Science Contest – Credit
  - 2011 UNSW ICAS – Math/Sci/English (Dist) Computers (Credit)
  - 2010 NUSHS Singapore Primary Science Olympiad – Gold
  - 2010 NUSHS National Math Olympiad of Singapore – Bronze
  - 2010 Anglo-Chinese Mathlympics – Individual 3rd; Gold
  - 2010 Anglo-Chinese Young Whizzes' Challenge – Gold
  - 2010 Singapore and ASEAN Schools' Math Olympiad – Gold
  - 2010 Australian Mathematics Competition – Dist
  - 2010 UNSW ICAS – Math (HighDist) Science (Dist) English/Writing/Computers (Credit)
  - 2009 UNSW ICAS – Math (HighDist) Science (Dist) English (Credit)
  - 2009 Australian Mathematics Competition (Dist)
  - 2008 UNSW ICAS – Math/Science/English (Dist)
  - 2008 Australian Mathematics Competition (Credit)

Links

- Contact: [email][phone]
- Websites: [Copypasta.substack][TheWindingNumber.blogspot][Homepage][PhysicsOverflow]
- Profiles: [StackExchange][LessWrong][Twitter][LinkedIn][Scholar][ORCID][Github][~~PhysicsForums~~]
- Random applets and such: [RShiny_Bayesian_inference][KhanAcademy_applets][Misc_neural_network_stuff]

Key: Regular, Archived, ~~Disowned~~