Dr. Alexander D. Wissner-Gross

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Overview

Dr. Alexander D. Wissner-Gross is an award-winning computer scientist, entrepreneur, advisor, and investor. He serves as President and Chief Scientist of Gemedy and Managing Director of Reified and has taught at Harvard and MIT. He has received 128 major distinctions, authored 23 publications, been granted 24 issued, pending, and provisional patents, and founded, advised, and invested in more than 33 technology companies. In 1998 and 1999, respectively, he won the USA Computer Olympiad and the Intel Science Talent Search. In 2003, he became the last person in MIT history to earn a triple major, with bachelor's degrees in Physics, Electrical Science and Engineering, and Mathematics, and graduated first in his class from the MIT School of Engineering with a Marshall Scholarship. In 2007, he completed his Ph.D. in Physics at Harvard, where his research on neuromorphic computing, machine learning, and programmable matter was awarded the Hertz Foundation's Doctoral Thesis Prize. A thought leader in artificial intelligence and cyber-physical systems, he is a contributing author of the New York Times Science Bestseller, *This Idea Must Die*, and the Amazon #1 New Release, *What to Think About Machines That Think*. A popular TED speaker, his talks have been viewed more than 2 million times and translated into 27 languages. His work has been featured in more than 200 press outlets worldwide, including The Wall Street Journal, BusinessWeek, CNN, USA Today, and Wired.

Education

2003-2007	Ph.D., Physics, Harvard University (Hertz Fellow; Hertz Doctoral Thesis Prize Winner)
	A.M., Physics, Harvard University
1999-2003	S.B., Physics, Massachusetts Institute of Technology
	S.B., Electrical Science and Engineering, Massachusetts Institute of Technology
	S.B., Mathematics, Massachusetts Institute of Technology
	(1st out of ~550 in MIT School of Engineering class as Henry Ford II Scholar)
1995-1999	Great Neck South High School, Great Neck, NY (1st out of 225)

Industrial Experience

2019-Present	Founder and Managing Director, Reified, LLC (startup investing and advising)
2011-Present	Founder, President, and Chief Scientist, Gemedy, Inc. (intelligent government systems)
2007-2016	Founder, Enernetics, Inc. (web analytics; acquired by Sustainable Travel International in 2016)
2006-2011	Founder and Partner, Maxtile Holdings GP
	(software incubator; acquired by Surf My Ads, Inc., in 2007 and ISC / Mindhive Inc. in 2011)

Academic Experience

2023-Present	Judge, President's Innovation Challenge, Harvard University
2017-Present	Alumni Expert in Residence, Massachusetts Institute of Technology
2012-2021	Institute Fellow and Associate, Institute for Applied Computational Science, Harvard University
2012-2020	SEAS Expert in Residence, Harvard Innovation Lab, Harvard University
2010-2019	Research Affiliate, Media Laboratory, Massachusetts Institute of Technology
2008-2010	Ziff Fellow, Computer Science, Harvard University

Government Experience

2023-Present	Reviewer, MassVentures
2016-Present	Subject Matter Expert, Homeland Defense and Security Information Analysis Center (HDIAC)
2016-2017	Task Force Observer (Design and Acquisition of Software for Defense Systems), Defense Science Board

Philanthropic Experience

2023	Co-Curator, TEDxBoston
2018-Present	Advisory Board Member, Brain Preservation Foundation
2016-Present	Organizing Committee Member, MIT Alumni Angels of Boston
2016-Present	Advisory Board Member, Organ Preservation Alliance
2015-Present	Scientific Advisory Board Member, The Lifeboat Foundation
2013-2020	Founding Member, W3C Sustainable Web Design Community Group
2010-Present	Fellowship Interviewer, The Fannie and John Hertz Foundation

Editorial and Refereeing Experience

ACM Computer-Human Interaction, Applied Physics Letters, Applied Sciences, Computer Graphics International, Econometrics, Energies, Entropy, IEEE Sensors Journal, IEEE Transactions of Knowledge and Data Engineering, Journal of Electronic Materials, Mathematics, Military Cyber Affairs, Nano Letters, Physica A, Physical Review X (Ad Hoc Editorial Board Member), Physical Review Letters, Proceedings of the National Academy of Sciences, Processes, Recent Patents on Nanotechnology (Editorial Board Member), Recent Patents on Space Technology, Software: Practice and Experience, Symmetry

Teaching Experience

Jan 2023	Guest Lecturer, MIT 6.S090 nanoStories: Workshop on Science Communication at the Nanoscale
Spring 2018	Guest Lecturer, George Mason University CYSE 499 Blockchain Technology
Fall 2016	Guest Lecturer, Harvard APCOMP 298R Interdisciplinary Seminar in Computational Science & Engineering
Jan 2012-2015	Creator and Instructor, Harvard IACS Computational Science Ventures
Spring 2007	Guest Lecturer, Harvard Freshman Seminar 22e Molecular Motors: Wizards of the Nanoworld
Spring 2006	Teaching Fellow, Harvard Physics 15a Introductory Mechanics and Relativity
Jan 2001	Creator and Instructor, MIT 6.370 IEEE/ACM (Battlecode) Programming Competition

Doctoral Committee Memberships

2020	John Paul F. Mintz ("Measuring the Effects of Artificial Intelligence Agents on Military-Strategic Behavior", Ph.D. in Military Strategy, School of Advanced Air and Space Studies, Air University, Maxwell AFB, Alabama)

Distinctions

2019	Contributing Author, Amazon #1 Best Seller in Science Essays & Commentary ("The Last Unknowns")
2019	Contributing Author, Amazon #1 New Release in Science Essays & Commentary ("The Last Unknowns")
2018	Certificate of Appreciation, U.S. Department of the Army
2016	Contributing Author, Amazon #1 New Release in Science Essays & Commentary ("Know This")
2016	Hive Global Leader
2016	SBA Emerging Business Leader (E200)
2015	Contributing Author, Amazon #1 New Release in Artificial Intelligence ("What to Think About Machines That Think")
2015	American Men & Women of Science
2015	Secretary of Defense Challenge Coin Recipient
2015	Renaissance Weekend Participant
2015	Contributing Author, #19 on New York Times Science Best Sellers List ("This Idea Must Die")
2015	Contributing Author, #5 on Northern California Indie Bestseller List ("This Idea Must Die")
2015	MIT Gathering of Titans Collaborator
2015	Google Solve for X Moonshot Pioneer
2014	Northrop Grumman Information Systems' Supplier Excellence Award
2014	TED Talk of the Week (ranked among top 20% of all TED Talks by views)
2013	Gifted Citizen Entrepreneurship Award Finalist
2013	Biggest Brain Award, Frog Design Inc.
2012	Elected to Young Engineers Organization (YEO)
2012	Featured Intel ISEF Alumnus, Society for Science & the Public
2012	Brain Sciences Foundation Fellowship
2012	Certificate of Recognition, Harvard Institute for Applied Computational Science
2011	Elected to Philosophical Society of Washington (PSW)
2011	Forbes 30 Under 30 Rising Stars of Science Nominee
2010	Science News of the Year (Technology), Society for Science & the Public
2009	Featured Young Innovator, NSF National Science Board
2009	Certificate of Appreciation, IEEE Computer Society of Connecticut
2008	Crunchies Startup Award Finalist ("Most Likely to Make the World a Better Place")
2008	Hertz Doctoral Thesis Prize Winner, Fannie and John Hertz Foundation
2008	Featured Entrepreneur, MIT Chairman's Salon
2008	Y Combinator Founder
2008	Winner, Summer@Highland Entrepreneurship Program (declined)
2008	Ziff Environmental Fellowship, Harvard University Center for the Environment
2007	Harold T. White Prize for Excellence in Teaching, Harvard Physics Department

2007	Nominee, Derek C. Bok Award for Excellence in Graduate Student Teaching of Undergraduates
2007	Dan David Prize Scholarship for Future Energy applications, Tel Aviv University
2007	Graduate Student Silver Award, Materials Research Society
2006	Finalist, named one of top 6 directors in amateur category, Materials Research Film Festival
2006	Nanotechnology paper selected for Institute of Physics Journal Highlights
2006	Book Prize, Harvard's Derek Bok Center for Teaching and Learning
2006	Harvard University Certificate of Distinction in Teaching
2006	Nominee, Harvard's Joseph R. Levenson Memorial Teaching Prize (only Physics nominee)
2004	First place (5km race) and Second place (500m race) team in division, Jichuan Cup International Dragon Boat Invitational Tournament for University Students in Tianjin, China
2003	Harvard Purcell Fellowship
2003	Malcolm Cotton Brown Award as top ranked MIT senior pursuing experimental physics
2003	Elected to Sigma Xi (scientific research) honor society
2003	Elected to Sigma Pi Sigma (physics) honor society
2003	Elected to Phi Beta Kappa (arts and sciences) honor society
2003	Runner-Up, Stanford Entrepreneur's Challenge
2003	Finalist, Carrot Capital Business Plan Challenge
2003	Finalist, MIT $50K Entrepreneurship Competition
2003	Henry Ford II Scholar Award, MIT School of Engineering
2003	Fannie and John Hertz Foundation Fellowship
2003	One of 20 named to USA Today All-USA 1st Academic College Team
2003	National Defense Science and Engineering Graduate Fellowship (declined)
2003	DOE Computational Science Graduate Fellowship (declined)
2003	NSF Graduate Research Fellowship (declined)
2003	Stanford Graduate Fellowship (declined)
2003	Caltech Richard P. Feynman Fellowship (declined)
2003	Yale Leigh Page Prize (declined)
2002	British Marshall Scholarship (declined)
2002	Winner in Tiny Technologies Category, MIT $1K Entrepreneurship Competition
2002	Elected to Tau Beta Pi (engineering) honor society
2002	Elected to Eta Kappa Nu (electrical & computer engineering) honor society
2002	First place nationally, Inaugural Intel Undergraduate Research Award
2001	Barry M. Goldwater Scholar
2001	Letters of commendation (top 2%) in 3 of the 4 core MIT EECS courses
2000	Director's Award, MITRE Corporation
2000	National Dean's List
1999	First Place, Ray L. Summa 34th Bomb Group Scholarship Award
1999	National Winner, New Technology, NITA Young Inventors & Creators Competition
1999	American Academy of Achievement's Salute to Excellence (personally sponsored by Lemelson Foundation)
1999	First place nationally, American Scholastic Mathematics Association (ASMA)
1999	Honorable Mention, First Step to Nobel Prize in Physics
1999	Valedictorian, Great Neck South High School
1999	National Winner, 10th Place, Intel Science Talent Search
1999	Inducted into National Young Inventors' Hall of Fame, National Gallery for America's Young Inventors
1999	One of 20 named to USA Today All-USA 1st Academic High School Team
1999	Lucent Global Science Scholar
1999	United States Navy Science Achievement Award
1999	Tandy Technology Scholar
1999	Grand Prize Winner, USA Math Talent Search (USAMTS)
1999	First Place, Army Physics Award, International Science and Engineering Fair (ISEF)
1999	Intel Best Use of PC Award, International Science and Engineering Fair
1999	Second Place, Physics Grand Award, International Science and Engineering Fair
1999	Second Place, Air Force Physics Award, International Science and Engineering Fair
1999	American Association of Physics Teachers Award, International Science and Engineering Fair
1999	Citation for Excellence, Nassau County Legislature
1999	International Honor Winner, Canadian Open Mathematics Challenge
1999	Honored Scholar, National Alliance for Excellence
1999	National AP Scholar
1999	National Merit Finalist

1998-1999	Who's Who Among American High School Students
1998-1999	First place in Senior Division with perfect score, American Computer Science League (ACSL)
1998	Member of U.S. team at International Olympiad in Informatics (IOI)
1998	Second place nationally, USA Computer Olympiad Finals
1998	First place individual, Fall Open Competition of USA Computer Olympiad
1998	First place nationally with perfect score, USA Math Talent Search (USAMTS)
1998	Winner and top-scoring American, Email Informatics Competition (EIC)
1998	Winner, Long Island Software Award
1998	Highest Scoring Student Award, American Scholastic Mathematics Association (ASMA)
1998	George Washington University School of Engineering & Applied Science Medal
1998	National Winner, Computer Science, NITA Young Inventors & Creators Competition
1998	Third place American and 14th place internationally, Central European Olympiad in Informatics (CEOI)
1998	First place out of 20,000 students with perfect score, Canadian Mathematics Fermat Competition
1998	First Place, C++, Continental Math League Computer Contest
1997	Fourth Place, Intel Grand Award in Computer Science, International Science and Engineering Fair
1997	Fourth place nationally, USA Computer Olympiad Fall Championship
1997	First place, American Computer Science League (ACSL)
1997	Top scoring U.S. sophomore, American Computer Science League (ACSL)
1997	Ross Young Scholar, Ohio State University
1997	AT&T Student Software Award, Long Island Software Awards
1997	Certificate of Achievement, Mathematical Contest in Modeling
1997	Certificate of Merit, The Assembly of the State of New York
1997	Certificate of Distinction, American High School Mathematics Examination
1997	Summa Cum Laude, National Latin Exam
1996-1998	Columbia University Science Honors Program
1996	Brandeis Summer Odyssey Young Scholar
1996	Perfect Score, National Latin Exam
1995-1996	Creative Problem-Solving Institute for Gifted and Talented Students
1995	Summa Cum Laude, National Latin Exam
1995	First Place, Pascal, Continental Math League Computer Contest
1994-1995	John Hopkins Center for Talented Youth (CTY)
1994	State and Regional Award, Mathematics and Verbal Talent Search
1992-1993	Performed with the New York City Opera Children's Chorus

Publications

23.	L. Lawley, W. Frey, P. Mullen, A. D. Wissner-Gross, "Joint sparsity-biased variational graph autoencoders," Journal of Defense Modeling and Simulation: Applications, Methodology, Technology 18, 239-246 (2021).
22.	A. D. Wissner-Gross, J. C. Willard, N. Weston, "Tamper-proofing imagery from distributed sensors using learned blockchain consensus," IEEE Applied Imagery and Pattern Recognition 2020, 1-4 (2021).
21.	A. D. Wissner-Gross, S. Kapa, J. Lee, D. Keenan, N. Drapeau, K. Londoner, "Computational reconstruction of electrocardiogram lead placement," Computing in Cardiology 2020, 1-3 (2020).
20.	A. D. Wissner-Gross, N. Weston, M. Vindiola, "Adaptive online learning for human-robot teaming in dynamic environments," IEEE Applied Imagery and Pattern Recognition 2019, 1-4 (2020).
19.	A. D. Wissner-Gross, "Can general-purpose computers be constructed out of pure gravity?" The Last Unknowns, 314 (ed., J. Brockman, 2019).
18.	A. D. Wissner-Gross, "Datasets over algorithms," Know This: Today's Most Interesting and Important Scientific Ideas, Discoveries, and Developments, 475-477 (ed., J. Brockman, 2017).
17.	A. D. Wissner-Gross, "Engines of freedom," What To Think About Machines That Think: Today's Leading Thinkers On The Age Of Machine Intelligence, 418-420 (ed., J. Brockman, HarperCollins, 2015).
16.	A. D. Wissner-Gross, "Intelligence as a property," This Idea Must Die: Scientific Theories That Are Blocking Progress, 277 (ed. J. Brockman, HarperCollins, 2015).
15.	A. D. Wissner-Gross, C. E. Freer, "Causal entropic forces," Phys. Rev. Lett. 110, 168702 (2013).
14.	A. D. Wissner-Gross, T. M. Sullivan, "Participatory telerobotics," Proc. SPIE 8758, 87580O (2013).
13.	A. D. Wissner-Gross, C. E. Freer, "Relativistic statistical arbitrage," Phys. Rev. E 82, 056104 (2010).
12.	A. D. Wissner-Gross, "Dielectrophoretic architectures," Bio-Inspired and Nanoscale Integrated Computing, 155-173 (ed. M. Eshaghian-Wilner, Wiley, 2009).
11.	A. D. Wissner-Gross, "Intruder dynamics on vibrofluidized granular surfaces," Mater. Res. Soc. Symp. Proc. 1152E, TT03-01 (2009).
10.	A. D. Wissner-Gross, "Pattern formation without favored local interactions," J. Cell. Auto. 4, 27-36 (2008).

9. A. D. Wissner-Gross, T. M. Sullivan, "Multicolor symbology for remotely scannable 2D barcodes," Proc. SPIE 6623, 662304 (2008).
8. L. Cong, A. D. Wissner-Gross, "Interrogating single molecules," Rec. Pat. Nanotech. 2, 19-24 (2008).
7. A. D. Wissner-Gross, "Physically programmable surfaces," Ph.D. Thesis, Department of Physics, Harvard University (2007).
6. A. D. Wissner-Gross, E. Kaxiras, "Diamond stabilization of ice multilayers at human body temperature," Phys. Rev. E Rapid Comm. 76, 020501 (2007).
5. A. Hatzor-de Picciotto, A. D. Wissner-Gross, G. Lavallee, P. S. Weiss, "Arrays of Cu(2+)-complexed organic clusters grown on gold nano dots," J. Exp. Nanosci. 2, 3-11 (2007).
4. A. D. Wissner-Gross, T. M. Sullivan, "From codex to poster," Libr. J. 132, S12-S13 (2007).
3. A. D. Wissner-Gross, "Dielectrophoretic reconfiguration of nanowire interconnects," Nanotechnology 17, 4986-4990 (2006).
2. A. D. Wissner-Gross, "Preparation of topical reading lists from the link structure of Wikipedia," Proc. IEEE ICALT 6, 825-829 (2006).
1. E. Wissner-Gross, A. D. Wissner-Gross, "People with disabilities," Journalism Across Cultures, 203-220 (ed. F. Cropp, Iowa State Press, 2003).

Patents

24. A. D. Wissner-Gross, T. M. Sullivan, "Surveillance using low-dimensional sensors," U.S. Provisional Patent Application 62/617,772 (2018).
23. A. D. Wissner-Gross, T. M. Sullivan, "System and method for extracting and exploiting causal networks," U.S. Provisional Patent Application 62/243,193 (2015).
22. A. D. Wissner-Gross, T. M. Sullivan, "Environmental footprint monitor for computer networks," U.S. Patent 8,862,721 B2 (2014).
21. A. D. Wissner-Gross, et al., "Identifying where to buy ingredients of a recipe," U.S. Patent Application 14/289,412 (2014).
20. A. D. Wissner-Gross, et al., "Providing an altered shopping experience in retail environments," U.S. Patent Application 14/289,382 (2014).
19. A. D. Wissner-Gross, "Process for electromagnetic vitrification," U.S. Provisional Patent Application 62/003,241 (2014).
18. C. E. Freer, A. D. Wissner-Gross, "System and method for relativistic statistical securities trading," U.S. Patent 8,635,133 (2014).
17. A. D. Wissner-Gross, et al., "Providing recreation and social activities in retail environments," U.S. Patent Application 13/710,227 (2014).
16. A. D. Wissner-Gross, et al., "Providing a proximity triggered response in a video display," U.S. Patent Application 13/710,053 (2014).
15. A. D. Wissner-Gross, et al., "In-store guidance systems and methods," U.S. Patent Application 13/710,204 (2013).
14. A. D. Wissner-Gross, et al., "Back-to-back video displays," U.S. Patent Application 13/875,890 (2013).
13. A. D. Wissner-Gross, T. M. Sullivan, "Data exfiltration attack detection," U.S. Provisional Patent Application 61/775,822 (2013).
12. A. D. Wissner-Gross, et al., "In-room hospitality devices and systems," U.S. Patent Application 13/770,841 (2013).
11. A. D. Wissner-Gross, "Causal entropy engine," U.S. Provisional Patent Application 61/738,573 (2012).
10. A. D. Wissner-Gross, et al., "User interface for accessing information about a retail store," U.S. Patent Application 13/710,163 (2012).
9. A. D. Wissner-Gross, et al., "Smart device location in retail environments," U.S. Patent Application 13/710,126 (2012).
8. A. D. Wissner-Gross, T. M. Sullivan, "Human-based telerobotic and telepresence method," U.S. Provisional Patent Application 61/705,657 (2012).
7. A. D. Wissner-Gross, T. M. Sullivan, "Method and apparatus for human-powered mobile visual search and feedback," U.S. Patent 8,073,864 (2011).
6. A. D. Wissner-Gross, T. M. Sullivan, "System and method for electronically certifying relationships," U.S. Provisional Patent Application 61/361,144 (2010).
5. A. D. Wissner-Gross, "Method for creating a topical reading list," U.S. Patent 7,739,294 (2010).
4. A. D. Wissner-Gross, E. Kaxiras, "Diamond stabilization of ice multilayers at human body temperature," U.S. Provisional Patent Application 61/053,737 (2008).
3. A. D. Wissner-Gross, T. M. Sullivan, "Multicolor symbology for remotely scannable codes," U.S. Provisional Patent Application 60/918,736 (2007).
2. A. D. Wissner-Gross, "Method of robotic manipulation utilizing patterned granular motion, " U.S. Patent 6,335,059 (2002).

1. A. D. Wissner-Gross, "Robotic manipulation system utilizing patterned granular motion," U.S. Patent 6,216,631 (2001).