

# Curriculum Vitae

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## I. POSITIONS HELD

- Associate Professor, Social and Decision Sciences, Carnegie Mellon University, 2021–. Assistant Professor, 2017–2021.
- External Professor, Complexity Science Hub, Vienna, Austria, 2017–.
- External Professor, Santa Fe Institute, Santa Fe, New Mexico, 2014–.
- Assistant Professor, School of Informatics and Computing; Faculty in Cognitive Science, College of Arts & Sciences. Indiana University, 2014–2016.
- Omidyar Fellow of the Santa Fe Institute, Santa Fe, New Mexico, 2010–2013.
- Postdoctoral Fellow of the Institute for the Physics and Mathematics of the Universe, University of Tokyo, 2009.
- Postdoctoral Fellow of the Kavli Institute for Cosmological Physics, University of Chicago, 2006–2009.

## II. EDUCATION

- Princeton University, Department of Astrophysical Sciences. Ph.D., 2006. Thesis: “Dark Energy : Theory and Observational Prospects.” Thesis Advisor: David Spergel. Thesis committee: Jerry Ostriker (Princeton, Astrophysics), Paul Steinhardt (Princeton, Physics).
- Cambridge University, Department of Applied Mathematics and Theoretical Physics. MSt., 2001. Part III of Mathematical Tripos (one year Masters) *Distinction* grade. Thesis: “Non-Gaussian Perturbations in the Cosmic Microwave Background.” Thesis Advisor: E. P. S. Shellard. King’s College Scholar Award.
- Harvard University, Department of Astrophysics. A.B., *Magna cum laude*. 2000. Thesis: “General Relativistic Constraints on Anomalous X-ray Pulsar Emission Models.” Thesis Advisors: Ramesh Narayan and Dimitrios Psaltis.

## III. AWARDS AND HONORS

- William S. Dietrich III Career Development Chair, Carnegie Mellon, 2021.
- Cozzarelli Prize for best Behavioral Sciences paper in *Proceedings of the National Academy of Sciences*, 2018.
- Foundational Questions Institute Essay Prize, 2018.

#### IV. FELLOWSHIP STUDENTS MENTORED

##### Postdoctoral Researchers & Ph.D. Candidates

- Kara Kedrick (postdoc; previously Psychology, University of Minnesota; joint advisor with Kevin Zollmann; Fall 2023—).
- Roman Tikhonov (postdoc; previously Psychology, St. Petersburg University; Summer 2022—Summer 2023).
- Duncan Wood (SDS PhD).
- Caitlan Fealing (SDS PhD; with Russell Golman).
- Chase MacDonald (SDS Ph.D.; with John Miller and Coty Gonzales).
- Molly Lewis (postdoc; jointly funded and mentored with CMU Psychology).
- Christina Boyce-Jacino (SDS Ph.D.; dissertation advisor with Gretchen Chapman; now postdoc, Army Research Office).
- Zachary Wojtowicz (SDS Ph.D; now postdoc, Harvard University Department of Economics).
- Sabina Sloman (SDS Ph.D.; with Danny Oppenheimer; now postdoc, University of Manchester).

##### Predocctoral Fellows at the Laboratory for Social Minds

- Victor M. Poulsen (Fall 2022—Summer 2023; previously Cognitive Science, Aarhus University).
- Robin Na (Spring 2021—Summer 2022; previously at New England Complex Systems Institute; now Ph.D. candidate, MIT Sloan School).
- Water Veit (Winter 2019; now Ph.D. candidate in Philosophy, University of Sydney).
- Madeline Kehl (Summer 2019—Spring 2021; previously undergraduate, University of Pittsburgh; now Data Engineer, Arcadia.io).
- Chloe Perry (Fall 2018—Fall 2020; previously Master's, Rhetoric, CMU; now Ph.D. candidate in American Studies, University of Michigan).
- Kent Chang (Fall 2018—Fall 2020; previously Master's, Digital Humanities, University College London; now Ph.D. candidate in Information Science, University of California Berkeley).
- Scott Viteri (Fall 2018—Fall 2020; previously undergraduate, Massachusetts Institute of Technology; now Ph.D. candidate in Computer Science, Stanford University).
- Gabe Salmon (Summer 2018; previously undergraduate, Oberlin College; awarded National Science Foundation Graduate Research Fellowship on the basis of his research with us; now Ph.D. candidate, Biophysical Sciences, California Institute of Technology).
- Will Thompson (Summer 2018; undergraduate, St. John's College, Santa Fe (SJC); awarded Ariel Funding from SJC; now researcher at Los Alamos National Laboratories).

## Undergraduate Fellows at the Laboratory for Social Minds

- Bonnie Yang (Summer 2024; undergraduate, Barnard College, Mathematics). Co-advised with Dr. Marina Dubova, Santa Fe Institute.
- Dillon Guludec (Spring 2023—; undergraduate, Tepper, CMU. Highway to Undergraduate Research in the Academic Year (HURAY) fellow; SURF fellow award. Co-advised with Dr. Kara Kedrick).
- Zachary Novack (Spring 2020—Summer 2022; undergraduate, Statistics, CMU; awarded SURG & Dietrich Senior Honors funding for lab research; named Andrew Carnegie Scholar 2021).
- Peter Ball (Spring 2020—Summer 2021; undergraduate at University of McGill; co-advised with Prof. Richard Jean So).
- Zhenzhen Liu (Spring 2019—Spring 2021; undergraduate, Statistics, CMU; now Ph.D. candidate in Information Science, Cornell University).
- Serena (Sihan) Dong (Summer, Fall 2018; undergraduate, SDS, CMU; now Deloitte, Hybrid Business Ventures).

Gender balance of students mentored: 10 female / 14 male.

## V. CMU SERVICE

- Faculty Search Committee Chair for Social and Decision Sciences / ICSD. 2023—
- Four lectures to CMU Alumni/ae as part of Jahanian Presidential Tour (Seattle, Palo Alto, New York, Pittsburgh). Donor lecture for Dietrich Day (Pittsburgh). 2023, 2024.
- Institute for Complex Social Dynamics Board. 2023—
- SDS Department Future Directions Committee, member; 2023—
- SDS Department Grant Committee, member; 2023—
- Review and promotion committee for pre-tenure and teaching-track faculty in SDS. One in 2022; one in 2023.
- SDS Graduate Student Climate Committee. 2021—
- Humanities at CMU Steering Committee. 2021—
- CMU/Pitt Collaboratory Against Hate. Steering Committee. 2021—2023
- Three lectures in support of Nik Gurney’s Summer “mini-bubbles”. 2020.
- Human Analytics (HumAn) Minor. Cross-Campus Teaching Initiative in Social, Cognitive, and Data Science. Committee member. 2018—
- Speaker, Social and Decision Sciences Executive Education Program, 2019.
- Taught “Intelligence” (one-month CMU-Qatar Campus Course). Fall 2019.
- Search committee for Assistant Professor position, Department of Physics, 2018.

Other significant service: Board of Reviewers for *Cognitive Science*; Editorial board for *Journal of Cultural Analytics*. Reviewer for journals in cognitive science (*Cognition*, *Cognitive Science*, *TiCS*, etc.), social science, information sciences, cultural analytics (*Nature Human Behavior*, *Entropy*, *PNAS*, *Philosophical Transactions*, etc.) Reviewer/nominator under confidentiality agreement for certain prize fellowships. External faculty at the Santa Fe Institute. External faculty at the Complexity Science Hub, Vienna. Pre-tenure letters for non-SDS departments. Non-SDS dissertation committees: Avery J. Wiscomb (CMU, LCS, 2021); Alexander Barron (IU, Complex Systems, 2021).

## VI. GRANTS AND FUNDING

Total grants and gifts from external/non-CMU sources, since joining CMU: \$1,219,057.

### A. Federal and Government Support

- “Machine Society: The Impact of Large Language Models on Human Culture” (SEP-210974038). European Union Marie Curie Global Fellowship (HE-MSCA-2023-PF). Associated partner (postdoctoral mentor) for PI Fabian Baumann. Approx €240,000 over three years. Applied for, 2023; not awarded.
- “From Archaeology to the Global Soundbank: Machine learning on (very) small data”. National Science Foundation ACCESS Explore Supercomputer Time Allocation at Pittsburgh Supercomputing Center. HUM220003 and HUM230001. Lead PI. 1.9M CPU-hours, \$22,800 equivalent, **Awarded**, 2022, 2023.
- “Foundations and Applications of Cultural Analytics in the Humanities”. Funding for a new Institute for Advanced Topics in the Digital Humanities. National Endowment for the Humanities. Co-PI with David Kinney at the Santa Fe Institute. \$229,639, **Awarded**, 2020.
- Doctoral Dissertation Research in DRMS: Judgments of Answerers and the Answers They Give. Supporting Christina Boyce-Jacino. National Science Foundation. \$23,420, **Awarded**, 2020.
- “Being Heard: Cultural Evolution from Laboratory to Archive.” National Endowment for the Humanities. Lead PI at CMU, with subaward to Fritz Breithaupt’s Experimental Humanities Laboratory at Indiana University. \$324,976, Not awarded, 2018.
- “The Role of Information in Structured Conflict.” Army Research Office. Lead PI at CMU, with subaward to Santa Fe Institute and the Interacting Minds Center, Aarhus University, Denmark. \$350,698 over two years, **Awarded**, 2017.

### B. Foundation Support

- “Summer Institute for Artificial Intelligence in Humanities Research”. Proposal to the Schmidt Foundation; PI with David Kinney (Washington University St Louis) and Meredith Martin (Princeton University). In prep, 2024.
- “Socratic Methods at Scale: Just-in-time Clustering and Analysis of Qualitative Student Responses in Large Lectures”. Proposal for the Generative AI + Education Tools: Seed Grant Program. Internal to CMU, with Co-PI Kevin Zollman. Applied for, 2024; not awarded.
- “Thinking together better, with machines: Revolutionizing Group-Based Discussions through LLM Interventions.” SONY Faculty Research Award Program. \$100,000. Applied for, 2023; not awarded.
- “Statistical Inference of Online Radicalization in Extremist Communities.” Dietrich College Senior Honors Program (\$6,500) and Small Undergraduate Research

Grant (SURG; \$300). Internal Summer funding for undergraduate research project, **Awarded**, 2021.

- Exploratory Studies in Cultural Evolution. John Templeton Foundation (JTF). \$50,000, **Awarded**, 2020.
- “Better Explanations Project.” General Support of the Laboratory for Social Minds. Survival and Flourishing Fund via Founders for Good. \$20,000, **Awarded**, 2019; \$11,000, **Awarded**, 2021. \$244,000, **Awarded**, 2022.
- “Creativity and Stasis in Science.” Templeton World Charity Foundation (TWCF). PI. \$40,000 over two years, **Awarded**, 2019.
- “The Mars Colony Game.” Interacting Minds Center, Aarhus, Denmark. Co-PI with Dan Mønster. \$15,000 over one year, to cover experiment costs, **Awarded**, 2019.

### C. Private Sector Support

- Support of the Laboratory for Social Minds for work related to the Collaboratory Against Hate. Gift from CMU Donors. \$5000, **Awarded**, 2021; \$7500, **Awarded**, 2022.
- General Support of the Laboratory for Social Minds. Principal Financial. \$50,000, **Awarded**, 2020; \$100,000, **Awarded**, 2021.
- General Support of the Laboratory for Social Minds. Bail Capital. \$50,000, **Awarded**, 2020.

## VII. PUBLICATIONS

Articles listed as “in prep”, “in review”, “revise & resubmit”, or “in press” available on request. Following traditions in the biological and physical sciences, I usually place the early career collaborator as the first author.

### A. Working Papers

1. From “um” to “yeah”: Producing, predicting, and regulating information flow in human conversation. Claire Augusta Bergey & **Simon DeDeo**. In review, *Proceedings of the National Academy of Sciences*, 2024.
2. The paradox of mental proof: artificial intelligence makes low-trust cooperation harder by making thinking easier. Zachary Wojtowicz & Simon DeDeo. In review. <https://arxiv.org/abs/2407.14452>. 2024
3. From Drift to Recombination in Cultural Evolution. Kara Kedrick & Simon DeDeo. Submitted, *Trends in Cognitive Science*. 2024.
4. Friction and the Case Against Efficiency in Social Media. Valentina Semenova, Simon DeDeo, Renee DiResta, Joe Bak-Coleman, Chris Kempes, Jan Eissfeldt, Chris Slowe, Susan Benesch, Thalia Wheatley, John Irons, Joshua Garland, Paul Smaldino, Seungwoong Ha, Annie Stephenson. In review, *Nature Human Behavior*, 2024.
5. Sameness entices, but novelty enchants in fan fiction online. Elise Jing, Simon DeDeo, Yong-Yeol Ahn. In review, *Nature Humanities and Social Sciences Communications*, 2024.
6. The Cognitive Science of Extremist Ideologies Online. Chloe Perry & **Simon DeDeo**. <https://arxiv.org/abs/2110.00626>. Preparing for resubmission, 2024.
7. Bound by Genre: Persistent Patterns in the 20th Century Russian Diary. Tatyana Gershkovich, Madeline Kehl & Simon DeDeo. *Russian Studies*. In review, 2024.
8. Consilience and cultural evolution in the Philosophical Transactions of the Royal Society. Gabe Salmon, Will Thompson, and **Simon DeDeo**. Preparing for submission, *Cognitive Science*. 2024.
9. Chinese astroturf and ineffective computational propaganda beyond the Great Firewall. Andy Zhao & **Simon DeDeo**. Preparing for resubmission, 2024.

### B. Chapters in Edited Volumes

10. How Collaboration Breaks Down. **Simon DeDeo**, Jenna Bednar, Eric Beinhocker, Esther Chevrot-Bianco, Zachary DuBois, Dorte Døjbak Håkonsson, Jônatas Manzolli, and Ferdinand von Siemens. In: *The Nature and Dynamics of Collaboration*, edited by Paul F. M. J. Verschure, Jenna Bednar, Bhavani Rao, Andreas Roepstorff, and Ferdinand von Siemens. Strüngmann Forum Reports, volume 34, series editor, Julia R. Lupp. Cambridge, MA: The MIT Press, in press. 2024. Preprint online.



11. Andrey Kolmogorov’s “Three approaches to the quantitative definition of information”. **Simon DeDeo**. Chapter in *Classic Papers in Complexity*, D. C. Krakauer, ed. Santa Fe, NM: SFI Press, 2023.
12. Gregory Chaitin’s “On the Length of Programs for Computing Finite Binary Sequences”. **Simon DeDeo**. Chapter in *Classic Papers in Complexity*, D. C. Krakauer, ed. Santa Fe, NM: SFI Press, 2023.
13. Cooperation, Interaction, Search: Computational approaches to the psychology of asking and answering questions. Christina Boyce-Jacino & **Simon DeDeo**. Peer reviewed chapter for *The Atlas of Language Analysis in Psychology*, edited by Morteza Dehghani & Ryan Boyd. Guilford Press. Published. 2022.
14. From Virus to Symptom. **Simon DeDeo**. Chapter in *Complexity after COVID*, D. C. Krakauer and G. B. West, eds. Santa Fe, NM: SFI Press, 2021.

### C. Invited Commentaries

15. Using big data to track major shifts in human cognition. **Simon DeDeo**. Invited Commentary. *Proceedings of the National Academy of Sciences*, 119 (4). 2022.
16. Private vs Public: A Dual Model for Resource-Constrained Conflict Representations. **Simon DeDeo**. *Behavioral and Brain Sciences*, 45(e102). Commentary on target article by David Pietraszewski. 2022.
17. From equality to hierarchy. **Simon DeDeo** & Elizabeth Hobson. Invited Commentary on Social Hierarchies. *Proceedings of the National Academy of Sciences*, 118 (21). 2021.

### D. Peer Reviewed Conference Proceedings

18. Cascades, Leaps, and Strawmen: How Explanations Evolve. Kara Kedrick, Kevin Zollman & **Simon DeDeo**. Accepted as full paper publication, *CogSci*. 2024.
19. Prediction, Explanation, and Control Under Free Exploration. Roman Tikhonov & **Simon DeDeo**. Accepted as full paper to *CogSci*. 2023.
20. Cognitive Attractors and the Cultural Evolution of Religion. Victor Møller Poulsen & **Simon DeDeo**. Accepted as full paper to *CogSci*. 2023.
21. The Role of Causal Reasoning in Complex Cooperation. Chase McDonald & Simon DeDeo. Accepted as abstract only to *CogSci*. 2023.
22. How Predictive Minds Explain and Control Dynamical Systems. Roman Tikhonov, Sarah Marzen & **Simon DeDeo**. Accepted as full paper to NeurIPS Workshop on Information-Theoretic Principles in Cognitive Systems. <https://openreview.net/forum?id=xk41NgCFxrj>. 2022.

23. The Diversity of Argument-Making in the Wild: from Assumptions and Definitions to Causation and Anecdote in Reddit’s “Change My View”. Robin W. Na & **Simon DeDeo**. Accepted as oral & paper presentation, *CogSci*. <https://arxiv.org/abs/2205.07938>. 2022.

### E. Peer-Reviewed Journal Articles

24. AlephZero and Mathematical Experience. **Simon DeDeo**. In press, *Bulletin of the American Mathematical Society*. 2024.
25. Large language models in the labyrinth: Possibility spaces and moral constraints. Victor Møller Poulsen & **Simon DeDeo**. *Possibility Studies & Society* 1 (4), 471-488. 2023.
26. Prediction, Explanation, and Control: The Use of Mental Models in Dynamic Environments. Roman Tikhonov & **Simon DeDeo**. *Open Mind* 7, 894-916. 2023.
27. Inferring Cultural Landscapes with the Inverse Ising Model. Victor Møller Poulsen & **Simon DeDeo**. *Entropy*. 25(2), 264. 2023.
28. The Cultural Transmission of Tacit Knowledge. Helena Miton & **Simon DeDeo**. *Journal of the Royal Society Interface*. 19: 20220238. 2022.
29. Epistemic Phase Transitions in Mathematical Proofs. Scott Viteri & **Simon DeDeo**. arXiv:2004.00055. *Cognition*, 225, 105120. 2022.
30. Learning communicative acts in children’s conversations: a Hidden Topic Markov Model analysis of the CHILDES corpus. Claire Bergey, Zoe Marshall, Dan Yurovsky, Simon DeDeo. *Topics in Cognitive Science*. Awarded the Cognitive Science Society’s Computational Modeling Prize in Language, 2021. Best of Papers from the 2021 Cognitive Science Society Conference. *Topics in Cognitive Science*, 14(2), 388-399. 2022
31. Aggression heuristics underlie animal dominance hierarchies and provide evidence of group-level social information. Elizabeth Hobson, Dan Mønster, Simon DeDeo. *Proceedings of the National Academy of Sciences*, 118(10). 2021.
32. Can we detect conditioned variation in political speech? Two kinds of discussion and types of conversation. Sabina Sloman, Daniel Oppenheimer, Simon DeDeo. *PLoS ONE*, 16(2). e0246689. 2021.
33. From Power to Consilience: Explanatory Values Enact Bayesian Reasoning. Zachary Wojtowicz & **Simon DeDeo**. *Trends in Cognitive Science*, 24(12) 981–993. 2020.
34. Divergence and the Complexity of Difference in Text and Culture. Kent Chang & **Simon DeDeo**. *Journal of Cultural Analytics*. doi:10.22148/001c.17585. 2020.
35. Opacity, Obscurity, and the Geometry of Question-Asking. Christina Boyce-Jacino, **Simon DeDeo**. *Cognition* 196, 104071. 2020.

36. How we do things with words: Analyzing text as social and cultural data. Dong Nguyen, Maria Liakata, Simon DeDeo, Jacob Eisenstein, David Mimno, Rebekah Tromble, Jane Winters. *Frontiers in Artificial Intelligence*, 3(62). 2020.
37. How Surprising is the French Revolution? Insights and Information Theory. Rebecca Spang and Simon DeDeo. Workshop for Eighteenth Century Studies, 67–74. 2019
38. Individuals, institutions, and innovation in the debates of the French Revolution. Alexander T. J. Barron, Jenny Huang, Rebecca Spang, **Simon DeDeo**. *Proceedings of the National Academy of Sciences*, 115.18: 4607-4612. Awarded Cozzarelli Prize. Full data release at [https://github.com/CogentMentat/FRevNCA\\_CuratedData](https://github.com/CogentMentat/FRevNCA_CuratedData). 2018.
39. State power and elite autonomy in a networked civil society: The board interlocking of Chinese non-profits. Ji Ma, **Simon DeDeo**. *Social Networks*, 54, 291-302. 2018.
40. Crosswords, Quiz Shows, and the Geometry of Question-Asking. Christina Boyce-Jacino and Simon DeDeo. CogSci-2018 Conference (Poster and Abstract). 2018.
41. Quantitative and Qualitative Approaches to the Development of Darwin’s Origin of Species. Jaimie Murdock, Colin Allen, and Simon DeDeo. *Current Research in Digital History* (1) 10.31835/crdh.2018.14. 2018.
42. An Interview-Based Study of Pioneering Experiences in Teaching and Learning Complex Systems in Higher Education. Joseph T. Lizier, Michael S. Harré, Melanie Mitchell, Simon DeDeo, Conor Finn, Kristian Lindgren, Amanda L. Lizier, Hiroki Sayama. *Complexity*. Article ID 7306871. 2018.
43. The Evolution of Lossy Compression. Sarah Marzen & **Simon DeDeo**. *Journal of The Royal Society Interface* 14 (130). Pages 20170166. 2017.
44. Exploration and exploitation of Victorian science in Darwin’s reading notebooks. Jaimie Murdock, Colin Allen, **Simon DeDeo**. *Cognition* 159, 117-126. 2017.
45. Conflict and computation on Wikipedia: A finite-state machine analysis of editor interactions. **Simon DeDeo**. *Future Internet* 8 (3), Pages 31–54. 2016.
46. The Evolution of Wikipedia’s Norm Network. Bradi Heaberlin, **Simon DeDeo**. *Future Internet*, 8(2), 14–35. 2016.
47. The Many Faces of State Space Compression. David Wolpert, Eric Libby, Joshua A Grochow, Simon DeDeo. Chapter for *From Matter to Life: Information and Causality* (Cambridge University Press). 199–243. Edited by Sara Imari Walker, Paul C.W. Davies, George Ellis. 2016.
48. Major Transitions in Political Order. **Simon DeDeo**. Chapter for *From Matter to Life: Information and Causality* (Cambridge University Press). 393–429. Edited by Sara Imari Walker, Paul C.W. Davies, George Ellis. 2016.
49. Weak universality in sensory tradeoffs. Sarah Marzen, **Simon DeDeo**. *Physical Review E* 94 (6). Pages 060101. 2016.

50. Wrong side of the tracks: Big Data and Protected Categories. **Simon DeDeo**. Chapter for *Big Data is Not a Monolith* (MIT Press). 31–41. Edited by Cassidy R. Sugimoto, Hamid Ekbia, Michael Mattioli. 2016.
51. Optimal High-Level Descriptions of Dynamical Systems. David H Wolpert, Joshua A Grochow, Eric Libby & **Simon DeDeo**. Chapter for *From Matter to Life: Information and Causality* (Cambridge University Press). Edited by Sara Imari Walker, Paul C.W. Davies, George Ellis. 2016.
52. Social feedback and the emergence of rank in animal society. Elizabeth Hobson & **Simon DeDeo**. *PLoS Computational Biology* 11(9). Page e1004411. 2015.
53. Group Minds and the Case of Wikipedia. **Simon DeDeo**. *Human Computation* 1:1. 5–29. 2014.
54. The Civilizing Process in London’s Old Bailey. Sara Klingenstein, Tim Hitchcock, & **Simon DeDeo**. *Proceedings of the National Academy of Sciences*. 111 (26) 9419-9424. 2014.
55. Robust Compressed Sensing and Sparse Coding with the Difference Map. Will Landercker, Rick Chartrand & Simon DeDeo. *European Conference on Computer Vision*, Part III, LNCS 8691, pp. 315–329 (2014).
56. Demystifying Information-Theoretic Clustering. Greg Ver Steeg, Aram Galstyan, Fei Sha & Simon DeDeo. *Proceedings of Machine Learning Research*, 32(1):19-27, 2014.
57. Dynamical structure of a traditional South American social network. Paul L. Hooper, **Simon DeDeo**, Ann E. Caldwell Hooper, Michael Gurven, Hillard S. Kaplan. *Entropy*, 15, 4932-4955. 2013.
58. Estimating Functions of Distributions Defined over Spaces of Unknown Size. David Wolpert, **Simon DeDeo**. *Entropy* 15, 4668-4699. 2013.
59. Collective Phenomena and Non-Finite State Computation in a Human Social System. **Simon DeDeo**. *PLoS ONE* 8(10), page e75818. doi:10.1371/journal.pone.0075818. arXiv:1212.0018 [cs.SI]. 2013.
60. Bootstrap Methods for the Empirical Study of Decision-Making and Information Flows in Social Systems. **Simon DeDeo**, Robert Hawkins, Sara Klingenstein & Tim Hitchcock. *Entropy*, 15(6), 2246-2276. arXiv:1302.0907 [cs.IT]. 2013.
61. Dynamics and Processing in Finite Self-Similar Networks. **Simon DeDeo** & David Krakauer. *Journal of the Royal Society Interface* 9(74), 2131-2144. 2012.
62. Evidence of strategic periodicities in collective conflict dynamics. **Simon DeDeo**, David Krakauer, Jessica Flack. *Journal of the Royal Society Interface* 8(62):1260. 2011.
63. Effective Theories for Circuits and Automata. **Simon DeDeo**. *Chaos* 21, page 037106. 2011.

64. Parallel Complexity of Random Boolean Circuits. Jon Machta, Simon DeDeo, Stephan Mertens & Cris Moore. *Journal of Statistical Mechanics* 4: page 04015–. 2011.
65. Inductive Game Theory and the Dynamics of Animal Conflict. **Simon DeDeo**, David Krakauer & Jessica Flack. *PLoS Computational Biology* 6(5): page e1000782–. 2010.
66. Intelligent Data Analysis of Intelligent Systems. David Krakauer, Jessica Flack, Simon DeDeo, Doyne Farmer & Daniel Rockmore. *Advances in Intelligent Data Analysis IX*. 8-17. 2010.
67. Neutron Stars in  $f(R)$  Gravity with Perturbative Constraints. Alan Cooney, Simon DeDeo & Dimitrios Psaltis. *Physical Review D* 82, page 064033–. 2010.
68. Gravity with Perturbative Constraints: Dark Energy Without New Degrees of Freedom. Alan Cooney, **Simon DeDeo** & Dimitrios Psaltis. *Physical Review D* 79, page 044033–. 2009.
69. Stable, Accelerating Universes in Modified Gravity. **Simon DeDeo** & Dimitrios Psaltis. *Physical Review D* 78, page 064013–. 2008.
70. Cluster Mass Estimators from CMB Temperature and Polarization Lensing. Wayne Hu, Simon DeDeo & Chris Vale. *New Journal of Physics* 9(12), page 441. 2007.
71. Particle Dark Energy. **Simon DeDeo**. *Physical Review D* 73, page 043520. 2006.
72. CH<sub>3</sub>CN Observations toward Southern Massive Star-forming Regions. Esteban Araya, Peter Hofner, Stan Kurtz, Leonardo Bronfman & Simon DeDeo. *Astrophysical Journal Supplement* 157(2). 297–301. 2005.
73. Towards New Tests of Strong-field Gravity with Measurements of Surface Atomic Line Redshifts from Neutron Stars. **Simon DeDeo** & Dimitrios Psaltis. *Physical Review Letters* 90, page 141101–. 2003.
74. Effects of the Sound Speed of Quintessence on the Microwave Background and Large Scale Structure. **Simon DeDeo**, R. R. Caldwell & Paul J. Steinhardt *Physical Review D* 67, page 103509–. 2003.
75. Eternal time machine in (2+1)-dimensional anti-de Sitter space. **Simon DeDeo**, J. Richard Gott. *Physical Review D* 66, page 084020–. 2002.
76. General Relativistic Constraints on Emission Models of Anomalous X-Ray Pulsars. **Simon DeDeo**, Dimitrios Psaltis, Ramesh Narayan. *Astrophysical Journal* 559, 346–542. 2001.
77. Photon Propagation around Compact Objects and the Inferred Properties of Thermally Emitting Neutron Stars. Dimitrios Psaltis, Feryal Özel, Simon DeDeo. *Astrophysical Journal* 544, 390–396. (2000).
78. Improved frequency stability of the dual-noble-gas maser. D. Bear, T. E. Chupp, K. Cooper, S. DeDeo, M. Rosenberry, R. E. Stoner, & R. L. Walsworth. *Physical Review A* 57, 5006–5008. 1998.

Other Publications (preprint only, not peer reviewed, or for popular audiences)

79. When Science is a Game. **Simon DeDeo**. <https://arxiv.org/abs/2006.05994>. 2020.
80. Lévy Flights of the Collective Imagination. Will Thompson, Zachary Wojtowicz, **Simon DeDeo**. <https://arxiv.org/abs/1812.04013>. 2020.
81. Origin Gaps and the Eternal Sunshine of the Second-Order Pendulum. **Simon DeDeo**. Book chapter in *Wandering Towards a Goal*. Edited by Aguirre A., Foster B., Merali Z. Springer, Cham. Awarded FQxI Essay Prize. 2018.
82. Org-scale analytics: Today’s startups build societies. Do it right. Seth Frey, Grace Benefield, Clark Bernier, Maarten Bos, Ceren Budak, Simon DeDeo, Rosta Farzan, Benjamin Mako Hill, Abigail Jacobs, Saiph Savage, Aaron Shaw. *Towards Data Science*, 2019.
83. Computational Analysis of the Wilson Social Cohesion Study. **Simon DeDeo**. White paper contribution for report to United Nations Children’s Fund (UNICEF), on the condition of Syrian Refugee Camps in Jordan. Project Leader Lydia Wilson. 2018.
84. The Paradox Manifesto. **Simon DeDeo**. *Cambridge Literary Review*, Vol 11. 14–19. 2018.
85. Information Theory for Intelligent People, **Simon DeDeo**. Circulating notes, reprinted as a Sante Fe Institute Working Paper. <https://sites.santafe.edu/~simon/it.pdf>. 2018.
86. Bayesian Reasoning for Intelligent People, **Simon DeDeo**. Circulating notes. <https://sites.santafe.edu/~simon/br.pdf>. 2018.
87. Report to the House of Lords of the United Kingdom on the Future of Artificial Intelligence. Joint submission with members of the Alan Turing Institute. London, UK. Summer 2017.
88. Apostrophes. *AGNI* 75 (2012); *Typo Magazine* 16 (2012); *Fence* (Winter 2012).
89. Cora Diamond: “What time is it on the Sun?”. **Simon DeDeo**. *Harvard Review of Philosophy* 8 (1), 69–81. 2000. <https://philarchive.org/archive/DIAWTI>
90. Studying the Rotation Curve and Matter Clumping of the Milky Way using the 21 cm Neutral Hydrogen Hyperfine Transition Line. **Simon DeDeo**. Presentation, awarded 8th Place in the Westinghouse Science Talent Search. 6 March 1996.
91. Mac Hack. **Simon DeDeo**. Published pseudonymously. *2600: The Hacker Quarterly* 10(4). Winter, 1993.

### VIII. TEACHING AT SUMMER AND WINTER SCHOOLS

- Santa Fe Institute Winter School, Mumbai, India. 5–8 December 2023.
- Foundations and Applications of Humanities Analytics. National Endowment for the Humanities Advanced Seminar. Co-organizer and lead lecturer for online and one week intensive in-person seminar. Summer 2022 and 2023.
- Future Theories of Intelligence. Four 2.5 hour graduate-level seminars for the New Centre for Practice and Research. <https://thenewcentre.org/seminars/introduction-future-theo> November 2021.
- Complexity Science Hub Vienna Winter School. Winter 2021.
- Winter Workshop on Complex Systems. ETH Zurich. Winter 2020.
- Santa Fe Institute Complex Systems Summer School. Multiple lectures and short-term research mentorships. Every Summer, 2010—2020.
- New England Complex Systems Institute. Summer 2019.
- Renormalization MOOC. Seven-part series on advanced methods. <https://renorm.complexityexplorer.org>. Santa Fe Institute. 2017.
- Maximum Entropy Methods MOOC. Twelve-unit series on advanced methods. <https://maxent.complexityexplorer.org>. Santa Fe Institute. 2017.

### IX. SELECTED PRESS, 2017—

- How the QAnon Conspiracy Seduces Normal People. Covers our work on the psychology of explanations. Faye Flam, *Bloomberg Opinion*. Accompanying Podcast. 30 January 2021.
- Humanities on a Non-Human Scale. Covers our new NEH Institute Grant. KUNM (NPR Affiliate). Three episodes, January 2021.
- How Close Are Computers to Automating Mathematical Reasoning? Covers our work on the cognitive science of mathematical proofs. Stephen Ornes, *Quanta Magazine*. 27 August 2020.
- NOVA: The Violence Paradox. PBS documentary with international distribution. Covers our work in the computational analysis of historical records. 20 November 2019.
- When the Humanities meet Big Data. *Christian Science Monitor*. 16 May 2018.
- The Bitcoin Paradox. The social science of cryptocurrencies. Simon DeDeo, *Nautilus Magazine*, <https://nautil.us/issue/55/trust/the-bitcoin-paradox>. 2017.
- Is Tribalism a Natural Malfunction? Simon DeDeo. *Nautilus Magazine*. <https://nautil.us/issue/52/the-hive/is-tribalism-a-natural-malfunction>. 2017
- New Math Untangles the Nature of Causality. *Wired Magazine*. 11 June 2017.
- Is Wiki-Journalism the Answer to Fake News? *Financial Times*, 12 May 2017.
- Tests to Prevent Algorithms Discriminating Unfairly. *New Scientist*, 29 March 2017.

## X. SELECTED INVITED TALKS, 2017—

1. Backchannels and Grice's Law. "Other Minds" Arizona State University BEYOND Center Workshop. 4 March 2024.
2. Large Language Models and Human Culture. Princeton LLM Forum Public Lecture Series, Center for Digital Humanities, Princeton University. 21 February 2024.
3. Possibility Architectures: Exploring Human Communication with Generative AI. Department of Psychology Invited Speaker Lunch, University of Wisconsin. 25 October 2023.
4. Possibility Architectures: Exploring Human Communication with Generative AI. CSS Speaker Seminar, S3@CMU. 5 October 2023.
5. Machine Learning for Archaeology. Database of Religious History Working Group. Santa Fe Institute. 6 July 2023.
6. Possibility Architectures: Exploring Human Communication with Generative AI. Alfred North Whitehead Honorary Lecture, Goldsmith's University of London. 24 May 2023.
7. Conspiracy Theories and Explanatory Values. Panelist for Santa Fe Institute's AcTion Network. 15 May 2023.
8. Possibility Architectures and the Surprisal Dynamics of Human Conversation. University of Chicago, Booth School of Business. 1 May 2023.
9. Possibility Architectures. Santa Fe Institute. 10 March 2023.
10. Machine Learning for Cultural Evolution. Stanford Graduate School of Business. 8 March 2023.
11. The Complex Dynamics of Online Extremism. Statistics Seminar Series. University of Texas, Austin. 4 November 2022.
12. Mathematics and Artificial Intelligence. Fields Medal Symposium. Invited Speaker and Discussant. 17 to 19 October 2022.
13. Coding the Past: The Challenges and Promise of Large-Scale Cultural Databases. Santa Fe Institute. 13 October 2022.
14. Possibilities Symposium. Invited Speaker and Discussant. John Templeton Foundation Meeting. Dublin, Ireland. 16 to 20 September 2022.
15. Sense-making at Scale. Santa Fe Institute. 22 July 2022.
16. Satisfying explanations and meaningful arguments: new results in the theory and practice of human epistemology. Invited lecture for Principles of Intelligent Behavior in Biological and Social Systems (PIBSS) Summer School. Prague, Czech Republic. 1 July 2022.
17. Language as a Window into Mind and Society. Invited speaker and discussant for working group led by Mahzarin Banaji. Santa Fe Institute. 2 to 6 June 2022.
18. Managing a Dramatically Changing World. Panel discussant with Austrian Federal Ministry Directors. Complexity Science Hub, Vienna, Austria. 30 May 2022.



19. Ernst Strungman Forum at the Frankfurt Institute of Advanced Studies: How Collaboration Arises and Why it Fails. Group “rapporteur” and lead author of group paper. 8 to 13 April 2022.
20. The Cognitive Science of Conspiracy. Bavarian Academy of Sciences. 29 April 2022.
21. Tacit Knowledge (joint talk with Helena Miton). Brunel Centre for Culture & Evolution, Brunel University, London, UK. 26 January 2022.
22. Consilience and the Cognitive Science of Scientific Explanation. Center for the Philosophy of Science, University of Pittsburgh, 16 November 2021.
23. Real World Extremist Ideologies. CounterBalance Seminar Series, Action Network, Santa Fe Institute. 26 May 2021.
24. The Tacit Truth of Tacit Knowledge. Strelka Institute, Russia. (Cancelled due to international events, 2021).
25. The Psychology of Conspiracy Theories. Dietrich Deep Dives. 21 April 2021.
26. Winter School Complexity Science Hub Lectures, Vienna. 23–25 March 2021.
27. Sense-Making at Scale. Colloquium. Institute for the Physics and Mathematics of the Universe. University of Tokyo, 16 February 2021.
28. Patterns in Scientific Speech. Heidelberg Institute for Theoretical Studies Meeting. Heidelberg University. 2 December 2020.
29. Sense-making at Scale. Alan Turing Institute. London, United Kingdom. 27 November 2020.
30. Explosive Proofs of Mathematical Truths. Center for the Philosophy of Science. University of Pittsburgh. 12 November 2020.
31. New Theories of Cultural Evolution. Ricardo Hausmann Growth Lab Seminar Series. Kennedy School of Government, Harvard University. 10 November 2020.
32. Information Theory and Cultural Evolution. Complexity Interactive Zoom Seminar. Santa Fe Institute. 26 October 2020.
33. Sense-Making at Scale. Cultural Data Analytics Open Lab Keynote. University of Tallinn, Estonia. 12 October 2020.
34. The Spread and Manipulation of Beliefs and Narratives. Santa Fe Institute Business Network. 7 October 2020.
35. Explanation-Making. Joint talk with Zach Wojtowicz. University of Pittsburgh Conspiracy Group. 25 June 2020.
36. Explosive Proofs of Mathematical Truths. Santa Fe Institute. 27 March 2020.
37. Sense-making at Scale. Data Science Lunch Seminar Series, NYU. 12 February 2020.
38. Seminar Leader, Winter Workshop on Complex Systems. ETH Zurich. 29 January 2020.
39. Ideas Matter. Trends, Ideas, and Leaders in History Working Group, Santa Fe Institute. 20 January 2020.

40. Plenary Talk. Computational Social Science Society of America. Via Zoom. 6 November 2019.
41. The Laboratory for Social Minds. CMU Qatar Introductory Research Talk. Qatar. 23 October 2019.
42. Frontiers of Cultural Analytics: Close Reading with Hidden Markov Models. NovelTM Conference, Banff, Canada. 17 October 2019.
43. The Epistemic Structure of Mathematics. Foundational Questions Institute Conference, Barga, Italy. 22 July 2019.
44. Second Data Science and Culture Conference (Co-organizer), Southern Methodist University, Taos Campus, Taos, NM. 1 July 2019.
45. “The Marriage (and Divorce) of Capitalism & Democracy”. Digital Humanities Literacy Guidebook, Filmed at CMU. 11 June 2019.
46. Complex Systems Summer School Lectures, Santa Fe Institute. June 2019.
47. Summer School Lectures, New England Complex Systems Institute. June 2019.
48. Cultural Evolution. Harvard Business School Digital Initiative. 8 May 2019.
49. Where do new things come from and what do we do when we get them? Midwest Undergraduate Cognitive Science Colloquium, Indiana University. 20 April 2019.
50. Behavior without Utility. Seminar on the Philosophy of Probability, Department of Philosophy, Rutgers, New Jersey. 8 April 2019.
51. Network Dynamics in Society, Culture, and Politics. CUNY Institute for the Theoretical Sciences. 5 April 2019.
52. Computational Social Science. School of International and Public Affairs, Columbia University. 4 April 2019.
53. Origin of Meaning. Arizona State University BEYOND Center, Tempe, AZ. 22 March 2019.
54. Psychohistory, Sandia National Laboratories and the Santa Fe Institute. 19 March 2019.
55. Information in Social Feedback (Meeting organizer), Santa Fe Institute. 4 February 2019.
56. Information Theory for the Digital Humanities (MOOC/Video Recordings), Santa Fe Institute. 14 January 2019.
57. Complexity for Cognition. Complex Systems Speaker Series, Carnegie Mellon University. 5 September 2018.
58. International Conference on Complex Systems (ICCS) Plenary Speaker. 24 July 2018.
59. Data Science and Culture Conference (Co-organizer), Southern Methodist University, Taos Campus, Taos, NM. 6 July 2018.
60. Complex Systems Summer School Lectures, Santa Fe Institute. June 2018.
61. New Directions in the Foundations of Physics, Viterbo, Italy. 7 June 2018.

62. Cognition and Data Science. Cognitive Science Colloquium, UC Merced. 23 April 2018.
63. Wikipedian Cooperation. Open Research Meeting, Perimeter Institute, Waterloo, Canada. 26 March 2018.
64. Data Science of Science. Cosmology Center, Carnegie Mellon University. 23 March 2018.
65. The Complexity of the Patenting System: Information, Uncertainty and Novelty, Santa Fe Institute. 12 March 2018.
66. Politics and Information. Organizations and Markets Series, Booth School of Business, UChicago. 20 February 2018.
67. The Meaning of Information. Santa Fe Institute. 18 January 2018.
68. Is artificial intelligence a threat to human culture? Y House Debate, Y House, New York, NY. 20 December 2017.
69. Dynamics of Novelty. Swartz Seminar, Center for Neural Science, NYU. 3 November 2017.
70. Innovation and Transience in Culture. NovelTM Conference, McGill University, Montreal, Canada, 26 October 2017.
71. The Data Science of Play. Alan Turing Institute, London, UK. 22 September 2017.
72. Patterns of peer production, NYU Tandon School of Engineering. 8 September 2017.
73. Conflict and Cooperation. Alpbach European Forum, Alpbach, Austria. 24 August 2017.
74. Politics of Information. Alan Turing Institute, London, UK. 13 July 2017.
75. Major Transitions in Culture. Centre de recherches interdisciplinaires (Interdisciplinary Research Center), Paris, France. 28 June 2017.
76. Complex Systems Summer School Lectures, Santa Fe Institute. June 2017.
77. Influence and Information. Y Conference, Y Combinator Research, San Francisco, CA. 9 June 2017.
78. The Data Science of Management. Special Presentation to Representatives of the Government of Singapore, Santa Fe Institute. 24 May 2017.
79. The Science of Counter Earth, Neukom Institute for Computational Science, Dartmouth College. 15 May 2017.
80. Information Theory in the French Revolution, Meeting of the Eighteenth Century Studies Association, Indiana University. 10 May 2017.
81. Quantifying Collective Behavior in Living Systems, Santa Fe Institute. 3 May 2017.
82. Princeton Political Economy & Text Analysis Meeting, Princeton, NJ. 28 April 2017.
83. Simons Foundation Lecture, Simons Center for Data Science, New York, NY. 19 April 2017.
84. Colloquium on Data Science and Culture, Southern Methodist University. 10 April 2017.

85. New Views on Social Feedback. DARPA Workshop at RAND on Social Behavioral Modeling and Simulation. 3 April 2017.
86. Science among the Machines. Google Research, Mountain View, CA. 20 March 2017.
87. Influence, Complexity and Networks: New Views for Business, Politics, Innovation, and Growth. Santa Fe Institute Business Network, Austen, Texas. 23 February 2017.
88. Dynamics of Wealth Inequality. Working group, Santa Fe Institute. 31 January 2017.