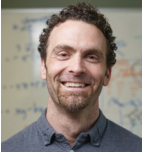
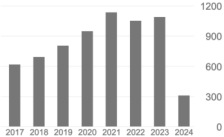
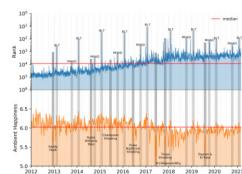
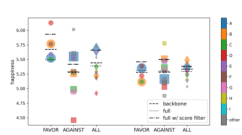
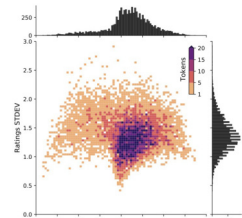
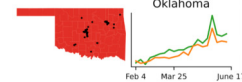
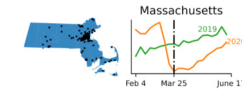
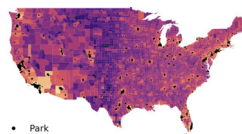
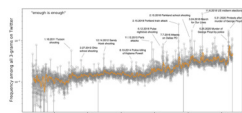
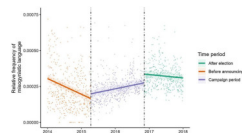
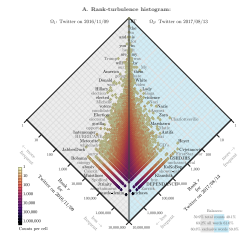
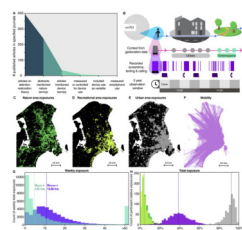


APPOINTMENTS: CURRENT	Professor, Department of Mathematics & Statistics, University of Vermont Co-Director, Computational Story Lab , Co-Founder, Hedonometer.org Director, Vermont Advanced Computing Center Associate Director, Vermont Complex Systems Center Department of Computer Science, College of Engineering & Mathematical Sciences Faculty Fellow, Gund Institute for Environment													
FORMER	Associate Professor, Department of Mathematics & Statistics Assistant Professor, Department of Mathematics & Statistics Director of the Graduate Program, Department of Mathematics & Statistics Mathematics & Climate Research Network Node PI Visiting Associate Scientist, Earth System Science Interdisciplinary Center, University of Maryland	2012-2019 2006-2012 2014-2019												
CONTACT	website: http://uvm.edu/~cdanfort email: chris.danforth@uvm.edu twitter: @chrisdanforth													
EDUCATION	University of Maryland , College Park, Maryland Ph.D., Applied Mathematics and Scientific Computation (AMSC) Advisors: James Yorke & Eugenia Kalnay M.S., Applied Mathematics and Scientific Computation	May 2006 December 2004												
	Bates College , Lewiston, ME. Magna Cum Laude, BS with Honors in Mathematics & Physics, Phi Beta Kappa	May 2001												
RECENT FUNDING	• \$20M Harnessing the Data Revolution for Vermont: The Science of Online Corpora, Knowledge, and Stories, Co-PI, National Science Foundation EPSCoR, 2023-2028. • \$10M MassMutual Center of Excellence in Complex Systems & Data Science, PI, 2017-2028. • \$3M Lived Experiences Measured Using Rings Study, PI, MassMutual, 2022-24. • \$1M NSF MRI: Acquisition of a massive database to accelerate data science discovery 2021-2023. • \$1M Google Open-Source Complex Ecosystems and Networks (OCEAN) project, 2020-2022. • \$1M AMD Donates Computing Power to VACC for COVID-19 Research, PI, 2020-2021.													
HONORS	University Scholar Award ‘for sustained excellence in research, creative, & scholarly activities’ ‘Best Paper Engaged in Quantitative Description on an Under-studied Phenomenon’ inaugural winner named by the Journal of Quantitative Description: Digital Media Kroepsch-Maurice Excellence in Teaching Award Outstanding CEMS Faculty Member award for “internal respect and external impact” Flint Professor of Mathematical, Natural, and Technical Science , Endowed Chair	2024 2024 2021-2022 2019 2013-2018												
PATENTS	<i>Methods for dynamic visualization of clinical parameters over time</i> 10188302													
Publications: HIGHLIGHTS	Instagram photos reveal predictive markers of depression . A. G. Reece, C. M. Danforth. EPJ Data Science. 2017. Among top 20 most discussed studies in 2017 (out of 2M) [Altmetric]. Human Language Reveals a Universal Positivity Bias . P. S. Dodds et. al., Proceedings of the National Academy of Sciences. 2015. The Geography of Happiness: Connecting Twitter sentiment and expression, demographics, and objective characteristics of place . L. Mitchell [†] , K. D. Harris [✉] , M. R. Frank [✉] , P. S. Dodds, C. M. Danforth. PLoS ONE. 2013. Temporal Patterns of Happiness in a Global-Scale Social Network: Hedonometrics & Twitter . P.S. Dodds, K.D. Harris [✉] , I.M. Kloumann [#] , C.A. Bliss [✉] , C. M. Danforth. PLoS ONE. 2011.													
CITATIONS	Co-author of over 100 peer-reviewed scientific publications Recipient of over 8,500 citations according to Google Scholar with h-index 39 <i>Updated May 2024</i>	<table><thead><tr><th></th><th>All</th><th>Since 2019</th></tr></thead><tbody><tr><td>Citations</td><td>8495</td><td>5354</td></tr><tr><td>h-index</td><td>39</td><td>31</td></tr><tr><td>i10-index</td><td>71</td><td>62</td></tr></tbody></table> 		All	Since 2019	Citations	8495	5354	h-index	39	31	i10-index	71	62
	All	Since 2019												
Citations	8495	5354												
h-index	39	31												
i10-index	71	62												

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105. *Nature Exposure is Associated With Reduced Smartphone Use.*

K. Minor, K. L. Glavind, A. J. Schwartz, C. M. Danforth, S. Lehmann, A. Bjerre-Nielsen. *Environment and Behavior*. 2023.

104. *Allotaxonomy and rank-turbulence divergence: A universal instrument for comparing complex systems.* P. S. Dodds, J. R. Minot[✉], M. V. Arnold[✉], T. Alshaabi[✉], J. L. Adams, D. R. Dewhurst[✉], T. J. Gray, M. R. Frank, A. J. Reagan, C. M. Danforth. *EPJ Data Science*. 2023.

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99. *Park visitation and walkshed demographics in the United States.*

K. Linnell[✉], M. Fudolig[†], L. Bloomfield[†], T. McAndrew, T. H. Ricketts, J. P. M. O'Neil-Dunne, P. S. Dodds, C. M. Danforth. *In Review*. 2023.

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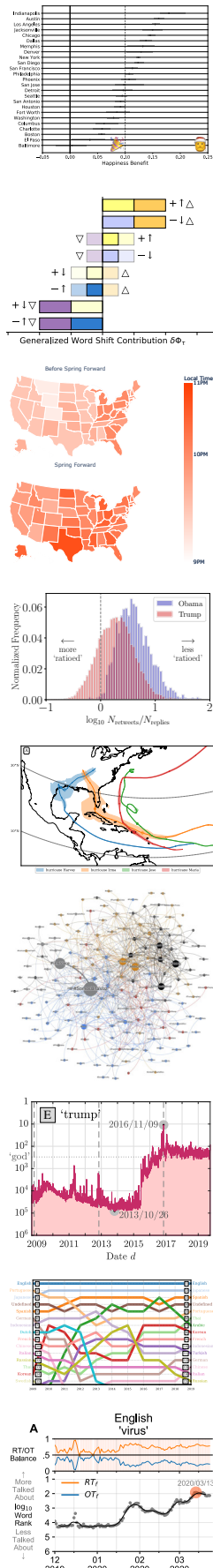
92. *Doomscrolling During COVID-19: The Negative Association Between Daily Social and Traditional Media Consumption and Mental Health Symptoms During the COVID-19 Pandemic.* M. Price, A. C. Legrand, Z. M. F. Brier, K. van Stolk-Cooke, K. Peck, P. S. Dodds, C. M. Danforth, Z. W. Adams. *Psychological Trauma: Theory, Research, Practice, and Policy*. 2022.

91. *Fame and Ultrafame: Measuring and comparing daily levels of 'being talked about' for U.S. presidents, their rivals, God, countries, and K-pop.*

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A. Schwartz[#], P. S. Dodds, J. P. M. O'Neil-Dunne, T. Ricketts, C. M. Danforth.
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89. *Ecological and Coevolutionary Dynamics in Modern Markets Yield Nonstationarity in Market Efficiencies.* C. M. Van Oort[#], J. H. Ring[#], D. R. Dewhurst[#], C. M. Danforth, B.F. Tivnan.
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81. *Hashtags and hurricanes: Characterizing exogenous collective attention to natural disasters on Twitter.* M. V. Arnold[#], D. R. Dewhurst[#], T. Alshaabi[#], J. R. Minot[#], J. L. Adams, C. M. Danforth, P. S. Dodds. PLOS ONE. 2021.

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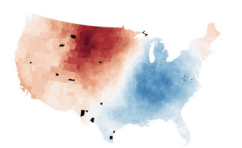
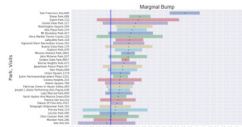
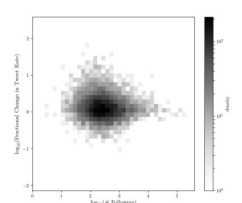
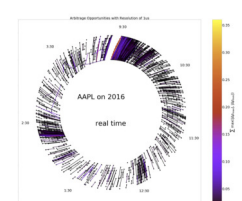
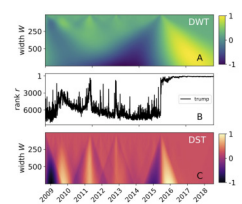
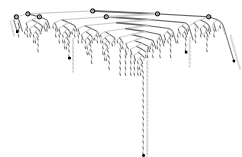
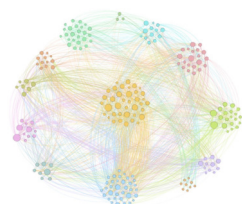
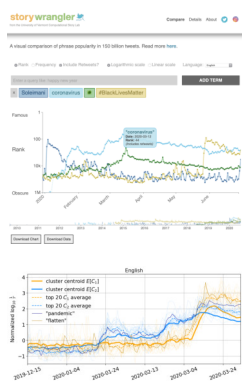
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T. Alshaabi[#], M. V. Arnold[#], J. R. Minot[#], J. L. Adams, D. R. Dewhurst[#], A. J. Reagan, R. Muhamad, C. M. Danforth, P. S. Dodds.
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74. *Divergent modes of online collective attention to the COVID-19 pandemic are associated with future caseload variance.* D. R. Dewhurst[#], T. Alshaabi[#], M. V. Arnold[#], J. R. Minot[#], C. M. Danforth, P. S. Dodds. arXiv.org 2020.

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70. *The shocklet transform: A decomposition method for the identification of local, mechanism-driven dynamics in sociotechnical time series.* D. R. Dewhurst[#], T. Alshaabi[#], D. Kiley, M. V. Arnold[#], J. R. Minot[#], C. M. Danforth, P. S. Dodds.

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69. *Scaling of inefficiencies in the U.S. equity markets: Evidence from three market indices and more than 2900 securities.*

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B. F. Tivnan, D. R. Dewhurst[#], C. M. Van Oort[#], J. H. Ring[#], T. J. Gray[#], B. F. Tivnan, M. T. K. Kohler, M. T. McMahon, D. Slater, J. Veneman, C. M. Danforth.
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66. *Social media usage patterns during natural hazards.*

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65. *Story Arcs in Serious Illness: Natural Language Processing features of Palliative Care Conversations.* L. Ross[#], C. M. Danforth, M. J. Eppstein, L. Clarfeld[#], B. Durieux[#], C. Gramling[#], L. Hirsch[#], D. M. Rizzo, B. Gramling.

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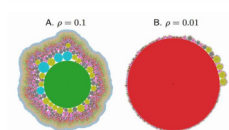
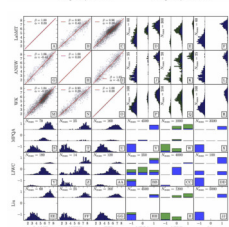
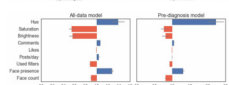
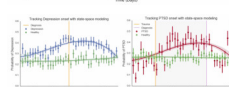
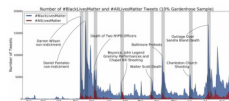
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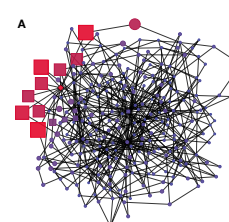
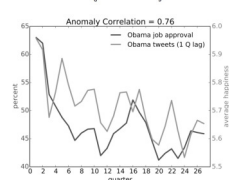
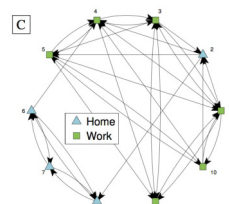
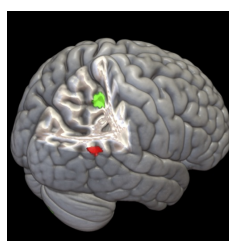
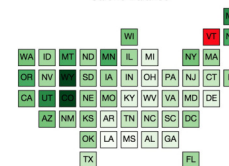
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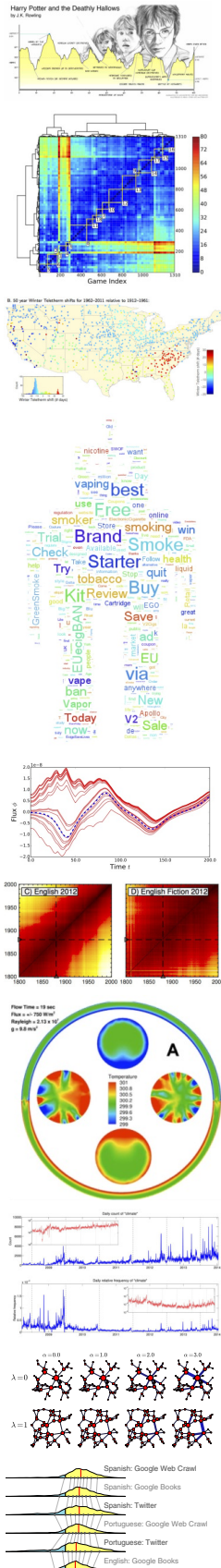


Caloric Balance



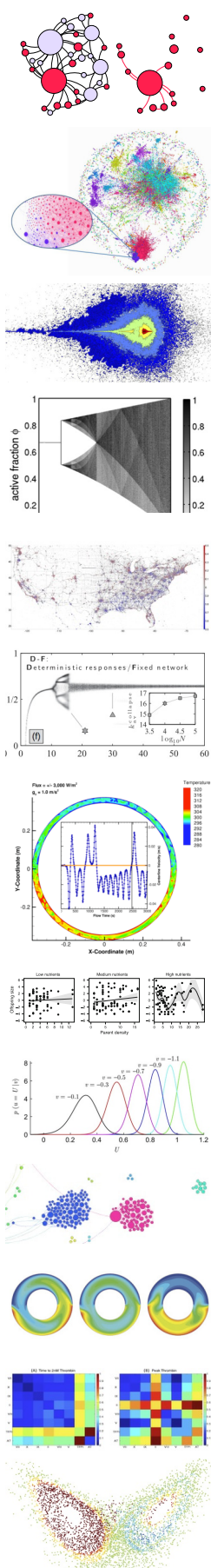
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52. *Connecting every bit of knowledge: The structure of Wikipedia's First Link Network*. M. Ibrahim[#], C. M. Danforth, P. S. Dodds. Journal of Computational Science. 2017.
51. *What we write about when we write about causality: Features of causal statements across large-scale social discourse*. T. C. McAndrew[#], J. C. Bongard, C. M. Danforth, P. S. Dodds, P. D. H. Hines., J. P. Bagrow. 2016 IEEE/ACM Int Conference on Advances in Social Networks Analysis & Mining.
50. *Zipf's law is a consequence of coherent language production*. J. R. Williams[#], J. P. Bagrow, A. J. Reagan[#], S. E. Alajajian[#], C. M. Danforth, P. S. Dodds. arXiv.org 2016.
49. *Data-driven Functional Mapping of the Human Brain*. N. A. Allgaier[#], J. Bongard, P. S. Dodds, C. M. Danforth, H. Garavan et al. arXiv.org 2016.
48. *Constructing a taxonomy of fine-grained human movement and activity motifs through social media*. M. R. Frank[#], J. R. Williams[#], L. Mitchell[†], J. P. Bagrow, P. S. Dodds, C. M. Danforth. arXiv.org 2016.
47. *Public Opinion Polling with Twitter*. E. Cody[#], A. J. Reagan[#], P. S. Dodds, C. M. Danforth. arXiv.org 2016.
46. *Shadow networks: Discovering hidden nodes with models of information flow*. J. P. Bagrow, S. Desu[#], M. R. Frank[#], N. Manukyan[#], L. Mitchell[†], A. Reagan[#], E. E. Bloedorn, L. B. Booker, L. K. Branting, M. J. Smith, B. F. Tivnan, C. M. Danforth, P. S. Dodds, J. C. Bongard. arXiv.org 2016.

Publications:
CONTINUED



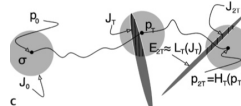
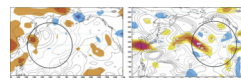
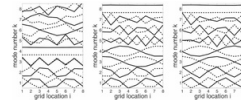
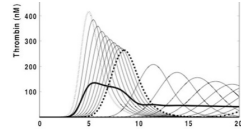
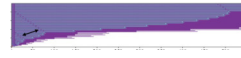
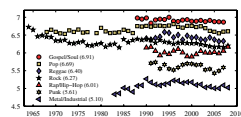
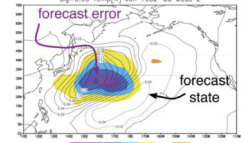
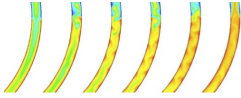
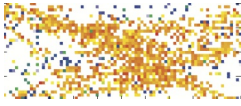
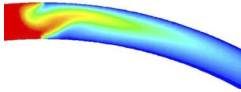
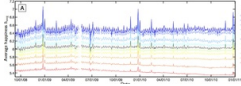
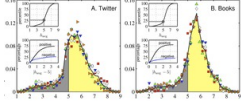
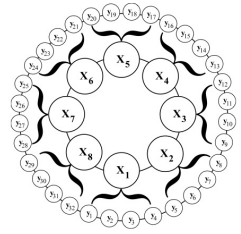
45. *The emotional arcs of stories are dominated by six basic shapes.*
A. J. Reagan[#], L. Mitchell[†], D. Kiley[#], C. M. Danforth, P. S. Dodds.
EPJ Data Science. 2016.
44. *The game story space of professional sports: Australian Rules Football.*
D. P. Kiley[#], A. J. Reagan[#], L. Mitchell, C. M. Danforth, P. S. Dodds.
Physical Review E. 2016.
43. *Tracking Climate Change through the Spatiotemporal Dynamics of the Teletherms, the Statistically Hottest and Coldest Days of the Year.*
P. S. Dodds, L. Mitchell[†], A. J. Reagan[#], C. M. Danforth.
PLoS ONE. 2016.
42. *Vaporous Marketing: Uncovering Pervasive Electronic Cigarette Advertisements on Twitter.*
E. Clark[#], C. A. Jones, J. R. Williams[#], A. N. Kurti, C. M. Danforth, P. S. Dodds.
PLoS ONE. 2016.
41. *Sifting Robotic from Organic Text, A Natural Language Approach for Detecting Automation on Twitter*
E. Clark[#], J.R. Williams[#], R.A. Galbraith, C.A. Jones, C. M. Danforth, P.S. Dodds.
Journal of Computational Science. 2016.
40. *Transitions in climate change awareness between Hurricanes Katrina and Sandy.*
E. Cody[#], J. P. Bagrow, P. S. Dodds, J. Stephens, C. M. Danforth.
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39. *Predicting Flow Reversals in a Computational Fluid Dynamics Simulated Thermosyphon using Data Assimilation.*
A. J. Reagan[#], Y. Dubief, P. S. Dodds, C. M. Danforth.
PLoS ONE. 2016.
38. *Characterizing the Google Books corpus: Strong limits to inferences of socio-cultural & linguistic evolution.* E. A. Pechenick[#], C. M. Danforth, P. S. Dodds.
PLoS ONE. 2015.
37. *Chaotic Natural Convection in a Toroidal Thermosyphon with Heat Flux Boundaries.*
W. F. Louisos, D. L. Hitt, C. M. Danforth. 2015.
International Journal of Heat & Mass Transfer. Vol 88, pg. 492-507.
36. *Climate Change sentiment on Twitter: An unsolicited public opinion poll.*
E. Cody[#], A. J. Reagan[#], L. Mitchell[†], P. S. Dodds, C. M. Danforth.
PLoS ONE. 2015.
35. *Identifying missing dictionary entries with frequency-conserving context models.*
J. R. Williams[#], E. Clark[#], J. P. Bagrow, C. M. Danforth, P. S. Dodds. 2015.
Physical Review E. 2016.
34. *Zipf's law holds for phrases, not words.*
J. R. Williams[#], S. Desu[#], E. Clark[#], P. R. Lessard[#], J. P. Bagrow, C. M. Danforth, P. S. Dodds.
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33. *Text mixing shapes the anatomy of rank-frequency distributions: A modern Zipfian mechanics for natural language.* J. R. Williams[#], J. P. Bagrow, C. M. Danforth, P. S. Dodds.
Physical Review E. 2015.
32. *Robustness of Spatial Micronetworks.*
T. C. McAndrew[#], C. M. Danforth, J. P. Bagrow.
Physical Review E. 2015.
31. *Human Language Reveals a Universal Positivity Bias.*
P. S. Dodds, E. Clark[#], S. Desu[#], M. R. Frank[#], A. Reagan[#], J. R. Williams[#], L. Mitchell[†], K. D. Harris[#], I. M. Kloumann[#], J. P. Bagrow, K. Megerdooimian, M. T. McMahon, B. F. Tivnan, C. M. Danforth.
Proceedings of the National Academy of Sciences. 2015.

Publications:
CONTINUED



30. *Standing Swells Surveyed Showing Surprisingly Stable Solutions for the Lorenz '96 Model*
M. R. Frank[✉], L. Mitchell[†], P. S. Dodds, C. M. Danforth.
International Journal of Bifurcation and Chaos. Vol. 24, No. 10. 2014.
29. *Estimation of Global Network Statistics from Incomplete Data.*
C. A. Bliss[✉], C. M. Danforth, P. S. Dodds.
PLoS ONE. 2014.
28. *Computational Studies of Multiple-particle Nonlinear Dynamics in a Spatio-Temporally Periodic Potential.*
O. Myers[✉], J. Wu, J. S. Marshall, C. M. Danforth.
Journal of Applied Physics. Vol. 115, 244908. 2014.
27. *An Evolutionary Algorithm Approach to Link Prediction in Dynamic Social Networks.*
C. A. Bliss[✉], M. R. Frank[✉], C. M. Danforth, P. S. Dodds.
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26. *Happiness and the Patterns of Life: A Study of Geolocated Tweets.*
M. R. Frank[✉], L. Mitchell[†], P. S. Dodds, C. M. Danforth.
Scientific Reports 2013. Vol. 3, No: 2625
25. *Dynamical influence processes on networks: General theory and applications to social contagion.*
K. D. Harris[✉], C. M. Danforth, P. S. Dodds.
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24. *The Geography of Happiness: Connecting Twitter sentiment and expression, demographics, and objective characteristics of place.*
L. Mitchell[†], K. D. Harris[✉], M. R. Frank[✉], P. S. Dodds, C. M. Danforth.
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23. *Limited Imitation Contagion on Random Networks: Chaos, Universality, and Unpredictability.*
P. S. Dodds, K. D. Harris[✉], C. M. Danforth.
Physical Review Letters. 110, 158701. 2013.
22. *Chaotic Flow in a 2D Natural Convection Loop with Heat Flux Boundaries.*
W. F. Louisos, D. L. Hitt, C. M. Danforth.
International Journal of Heat & Mass Transfer.
Vol. 61, June 2013, Pages 565-576.
21. *Nutrient Enrichment Alters Weedy Plant Population Dynamics.*
J. Molofsky, C. M. Danforth, E. E. Crone.
Population Ecology. 2013.
20. *Estimating Distance to Critical Transitions from Time-series Synchrophasor Data.*
E. Cotilla-Sanchez[✉], P. Hines, C. M. Danforth.
IEEE Transactions on Smart Grid. 2012.
19. *Twitter Reciprocal Reply Networks Exhibit Assortativity with respect to Happiness.*
C. A. Bliss[✉], I. M. Kloumann[#], K. D. Harris[✉], C. M. Danforth, P. S. Dodds.
Journal of Computational Science. **3**, No 5, Pg. 388 - 397, 2012.
18. *Predicting Flow Reversals in Chaotic Natural Convection using Data Assimilation.*
K. D. Harris[✉], E.-H. Ridouane[†], D. L. Hitt, C. M. Danforth.
Tellus A 2012, 64, 17598.
17. *Defining the Boundaries of Normal Thrombin Generation: Investigations into Hemostasis.*
C. M. Danforth, T. Orfeo, S.J. Everse, K.G. Mann, K. Brummel-Ziedins.
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16. *Empirical Correction of a Toy Climate Model.*
N. Allgaier[✉], K. D. Harris[✉], C. M. Danforth.
Physical Review E. **85**, 026201. 2012.

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15. *Aggressive Shadowing of a Low-Dimensional Model of Atmospheric Dynamics.*
R. Lieb-Lappen[#], C. M. Danforth.
Physica D. Volume 241, Issue 6, 637-648. 2012.

14. *Positivity of the English Language.*
I. M. Kloumann[#], C. M. Danforth, K. D. Harris[#], C. A. Bliss[#], P. S. Dodds.
PLoS ONE 7(1): e29484. 2012.

13. *Temporal Patterns of Happiness in a Global-Scale Social Network: Hedonometrics & Twitter.*
P.S. Dodds, K.D. Harris[#], I.M. Kloumann[#], C.A. Bliss[#], C. M. Danforth.
PLoS ONE 6(12): e26752. 2011.

Top 1% most cited PLoS ONE articles.

12. *A Numerical Investigation of 3-D Flow Regimes in a Toroidal Natural Convection Loop.*
E.-H. Ridouane[†], C. M. Danforth, D. L. Hitt.
Int Journal of Heat & Mass Transfer. 2011.

11. *The Interplay of Chaos between the Terrestrial and Giant Planets.*
W. Hayes, A. Malykh[#], C. M. Danforth.
Monthly Notices of the Royal Astronomical Society. 2010.

10. *A 2-D Numerical Study Of Chaotic Flow In a Natural Convection Loop.*
E.-H. Ridouane[†], C. M. Danforth, D. L. Hitt.
Int Jrn Heat & Mass Transfer. 2009.

9. *Accounting for Model Errors in Ensemble Data Assimilation.*
H. Li, E. Kalnay, T. Miyoshi, C. M. Danforth.
Monthly Weather Review. **137**, No. 10, 3407-3419. 2009.

8. *Complex Dynamic Behavior During Transition in a Solid Combustion Model.*
J. Yu, L. K. Gross, C. M. Danforth.
Complexity.
14, No. 6. 2009.

7. *Measuring the Happiness of Large-Scale Written Expression: Songs, Blogs, and Presidents.*
P. S. Dodds, C. M. Danforth.
Journal of Happiness Studies. 2009.

6. *Dynamic Structure of Networks Updated According to Simple, Local Rules.*
K. L. Morrow[#], T. Rowland, C. M. Danforth.
Physical Review E. **80**, 016103. 2009.

5. *The Impact of Uncertainty in a Blood Coagulation Model.*
C. M. Danforth, T. Orfeo, K.G. Mann, K. Brummel-Ziedins, S.J. Everse.
Mathematical Medicine & Biology. 2009.

4. *Impact of Empirical Model Correction on Nonlinear Error Growth.*
C. M. Danforth, E. Kalnay.
Geophysical Research Letters, **35**, L24805. 2008.

3. *Using Singular Value Decomposition to Parameterize State-Dependent Model Errors.*
C. M. Danforth, E. Kalnay.
Journal of the Atmospheric Sciences, **65**, No. 4, 1467-1478 (2008).

2. *Estimating and Correcting Global Weather Model Error.*
C. M. Danforth, E. Kalnay, T. Miyoshi.
Monthly Weather Review, **135**, No. 2, 281-299 (2007).

1. *Making Forecasts for Chaotic Physical Processes.*
C. M. Danforth, J. A. Yorke.
Physical Review Letters, **96**, 144102 (2006).

Undergraduate Student [#] Graduate Student [†] Postdoc

Research Team:	Degree	Team Member	Year	Thesis Topic or Current Employment	10
	Postdoc	Laura Bloomfield! [*]	2021-	GUND Institute	
	Postdoc	Mikaela Fudolig [*]	2020-	MassMutual Center of Excellence	
	Postdoc	Lewis Mitchell [*]	2012-4	Senior Lecturer at University of Adelaide	
	Postdoc	El Hassan Ridouane	2011-2	United Technologies Research Center	
	PhD	Ashley Fehr [*]	202x	Complex Systems	
	PhD	Calla Beauregard [*]	202x	Complex Systems	
	PhD	Julia Zimmerman [*]	202x	Algorithmic Fairness	
	PhD	Will Thompson [*]	202x	Complex Systems	
	PhD	Mariah Boudreau [*] Π	202x	Mathematical Epidemiology	
	PhD	Yoshi Bird [*]	202x	Data science for homelessness services	
	PhD	Michael Arnold [*]	202x	Public Opinion from Social Media	
	PhD	Josh Minot [*]	2022	Data Scientist at MassMutual	
	PhD	Kelsey Linnell [*]	2022	Data Scientist at LL Bean	
	PhD	Danne Elbers [*]	2022	Bioinformatics Data Architect @ MAVERIC Boston VA	
	PhD	Thayer Alshaabi [*]	2021	Postdoc, Advanced Bioimaging Center, UC Berkeley	
	PhD	Colin Van Oort [*] #⌘	2021	Computational Finance Lead, MITRE Corporation	
	PhD	John Ring IV [*] # ✓	2021	Cybersecurity at MassMutual	
	PhD	Aaron Schwartz [*] !	2020	Data Scientist at Stryd	
	PhD	David Dewhurst [*] #	2020	Charles River Analytics	
	PhD	Tyler Gray [*]	2019	Mathematician at Institute for Defense Analyses	
	PhD	Eric Clark [*]	2018	Data Scientist at NeuroPath	
	PhD	Andy Reagan [*]	2017	Data Scientist at MassMutual	
	PhD	Emily Cody [*]	2016	Software Engineer at Adobe	
	PhD	Tom McAndrew [*] %	2016	TT Asst Prof, College of Health, Lehigh University	
	PhD	Jake Williams [*]	2015	TT Asst Prof, Information Sciences, Drexel University	
	PhD	Eitan Pechenick [*]	2015	Maine School of Science & Mathematics	
	PhD	Catherine Bliss [*]	2014	Faculty at SUNY	
	PhD	Nicholas Allgaier [*] +△	2014	Faculty at UVM	
	MS	Parisa Suchdev [*]	2023	Arabic Hedonometer	
	MS	Carter Ward [*] ⌘	2023	Vaccine Hesitancy	
	MS	Vanessa Myhaver [*]	2022	Mission Design Engineer at NASA Jet Propulsion Lab	
	MS	Amelia Tarren [*]	2022	Data Scientist at the Veteran's Administration	
	MS	Kelly Gothard [*]	2021	Data Scientist at Reddit	
	MS	Anne-Marie Stupinski [*]	2021	Data Scientist at Talkspace	
	MS	Todd DeLuca [*]	2021	Research Scientist at UVM	
	MS	Ethan Davis [*]	2021	Digital & Data Science Specialist, Lewis & Clark College	
	MS	Max Green [*]	2020	Data Scientist at Tomorrow.io	
	MS	Andy Metcalf [*]	2019	Data Scientist at Optimal Solutions Inc	
	MS	Sandhya Gopchandani [*]	2019	Machine Learning at iManage	
	MS	Ben Emery [*] ⌘	2019	Research Statistician at Sandia National Laboratory	
	MS	Abby Ross [*]	2017	Northfield Mount Hermon School	
	MS	Ryan Gallagher [*]	2017	Data Scientist at Alethea	
	MS	Dilan Kiley [*]	2016	Data Scientist at Zillow	
	MS	Sharon Alajajian [*]	2015	Admissions @ UC Berkeley	
	MS	Morgan Frank [*]	2014	TT Asst Prof, Informatics & Networked Systems, UPitt	
	MS	Mike Foley [*] #	2014	PhD student at Northeastern	
	MS	Kayla Horak [*]	2014	Statistician, Forest Products Lab	
	MS	Kameron D. Harris [*]	2012	TT Asst Prof, Computer Science, Western Washington	
	MS	Ross Lieb-Lappen [*]	2011	Faculty at Vermont Technical College	
	MS	Dan Brown	2008	Actuary at Prudential Financial	
	Staff	Andrea Elledge	2010-	Engagement Officer VACC	
	Staff	Melissa Parr	2018-	Program Manager VCSC	
	Staff	Rachel Dotey	2022-3	Data Engineer VACC	
	Staff	Kathryn Stanton \$&	2022-	Research Coordinator LEMURS	
	Staff	Jordan Llorin \$&	2022-	Research Coordinator LEMURS	
	Staff	Julia Kim \$&	2022-	Research Coordinator LEMURS	
CO-ADVISORS:					
* PETER DODDS					
+ JOSH BONGARD					
# BRIAN TIVNAN					
% JAMES BAGROW					
Ω DONNA RIZZO					
⌘ LIZZY POPE					
Π LAURENT HÉBERT-DUFRESNE					
⌘ SAFWAN WSHAH					
! TAYLOR RICKETTS					
△ HUGH GARAVAN					
⌘ MEREDITH NILES					
& MATT PRICE					
⌘ MAGGIE EPPSTEIN					
\$ RYAN MCGINNIS					
⌘ BOB GRAMLING					
⌘ SARAH NOWAK					
⌘ MATT MAHONEY					
✓ CHRIS SKALKA					
⌘ LESLEY-ANN DUPIGNY-GIROULX					

**Research
Team:**

Degree	Team Member	Year	Thesis Topic or Current Employment
UG	Isabelle Smith*	2024	Statistics for Public Health
UG	Murphy Peisel*	2024	Sentiment of Music Lyrics
UG	Delaney Woods*	2022	Emotional arcs of Stephen King novels
UG	Megan Ardren*	2021	Public opinion on Immigration
UG	Ben Kotzen*	2020	Game theory applied to cooperation in the US Congress
UG	Sophie Hodson*	2019	Data Scientist at Algorex Health
UG	Henry Mitchell* ¹	2019	Grad student at Johns Hopkins
UG	Lindsay Ross ²	2019	Software Engineer at Apple
UG	Laura Jennings* ³	2019	Actuary at River and Mercantile
UG	Sven McCall* ⁴	2018	Data Scientist at Fatmap
UG	Brendan Whitney* ⁵	2017	Data Scientist at Faraday
UG	Fletcher Hazlehurst*	2014	Programmer at Rock Gym Pro
UG	Suma Desu Bailis *	2013	Senior Machine Learning Engineer at Google
UG	Darcy Glenn &	2013	MS student at Univ College London
UG	Ashley McKhann &	2012	MS student at Harvard
UG	Isabel Kloumann*	2010	PhD Cornell, AI & Ethics at Facebook
UG	Kate Taggart*	2008	Engineering manager at HashiCorp

**COURSES
TAUGHT**

University of Vermont, Burlington, Vermont

Term	Course	#	UG	GR	Q1*	Q2 ⁺
F '10	Linear Algebra	124	33	0	4.74	3.78
F '11	Linear Algebra	124	37	0	4.76	3.55
S '14	Linear Algebra	124	48	0	4.89	3.60
F '14	Linear Algebra	124	47	1	4.83	3.86
F '16	Applied Linear Algebra	122	57	0	4.58	3.94
F '10	Intro to Numerical Analysis	237	28	6	4.52	3.90
F '11	Intro to Numerical Analysis	237	31	9	4.80	4.20
F '13	Intro to Numerical Analysis	237	21	7	4.74	3.63
F '17	Intro to Numerical Analysis	237	43	7	4.35	4.55
F '18	Intro to Numerical Analysis	237	19	7	4.64	4.64
F '20	Intro to Numerical Analysis	237	37	6	4.44	4.61
F '22	Intro to Numerical Analysis	237	18	6	4.62	4.69
S '10	Chaos, Fractals, & Dynamical Systems	266	31	6	4.62	4.62
S '11	Chaos, Fractals, & Dynamical Systems	266	24	8	4.83	4.39
S '13	Chaos, Fractals, & Dynamical Systems	266	24	9	4.44	4.40
S '14	Chaos, Fractals, & Dynamical Systems	266	18	10	5.00	4.37
S '15	Chaos, Fractals, & Dynamical Systems	266	24	10	4.91	4.65
S '16	Chaos, Fractals, & Dynamical Systems	266	30	7	4.71	4.83
S '17	Chaos, Fractals, & Dynamical Systems	266	32	4	4.50	4.69
S '18	Chaos, Fractals, & Dynamical Systems	266	28	4	4.45	4.91
S '19	Chaos, Fractals, & Dynamical Systems	266	35	5	4.81	4.69
S '21	Chaos, Fractals, & Dynamical Systems	266	22	14	4.65	4.92
S '22	Chaos, Fractals, & Dynamical Systems	266	17	8	4.64	4.86
S '23	Chaos, Fractals, & Dynamical Systems	266	15	9	4.36	4.43
F '15	Graduate Ordinary Differential Equations	330	2	4	5.00	3.50
F '16	Graduate Ordinary Differential Equations	330	1	8	4.50	4.50
F '21	Graduate Ordinary Differential Equations	330	4	9	4.89	4.78
S '16	Graduate Seminar: Complex Systems	382	4	11	4.50	3.58
S '21	Graduate Seminar: Data Ethics [#]	395	17	6	4.67	4.25

[#] Joint w/Peter Dodds, Randall Harp, Juniper Lovato

*What was the overall effectiveness of the instructor? (5-excellent)

⁺How academically and intellectually challenging was this course? (5-very difficult)

Measuring Happiness & Health with Social Media

- [Data Science Seminar](#), Institute for Mathematics & Applications. 2021.
- MIT Media Lab, Human Dynamics group. 2020.
- Keynote at Keystone Conference on Digital Health, Keystone, CO. 2019.
- Dartmouth College, Center for Technology & Behavioral Health, 2019.
- Duke University, Center for Applied Genomics and Precision Medicine, 2018.
- Brigham Young University, Department of Mathematics, 2018.
- Brown University, Inaugural seminar of the Brown Data Science Initiative, 2017.

Limits to Socio-Cultural Inference

- Northwestern Institute on Complex Systems, 2016.
- UMass Amherst, 2016.

Measuring the Happiness, Health, and Stories of Populations, MIT Media Lab, 2015.

Vermont Edition, Vermont Public Radio

- [Finding Math In Beer, Television & The Real World](#), 2019.
- [3.1416 Hey, It's \$\pi\$ Day](#), 2016.

Improving Numerical Weather Predictions using Ideas from Nonlinear Dynamics,

- University of Chicago, Scientific & Statistical Computing Seminar, 2013.
- Invited Address, MAA MATHFEST, Hartford, CT 2013.
- SIAM Conference on Applications of Dynamical Systems, Snowbird, UT 2013.

Taming Atmospheric Chaos with Big Data, UVM TEDx 2011, [Big Data: Big Stories](#).

The Hedonometer: A Remote-Sensor of Population-Level Happiness,

- University of Montreal, CRM, Grande Conference Publique, invited public lecture, 2014.
- Northwestern University, Network Frontiers Workshop, invited evening talk, 2013.
- University of Chicago, Computations in Science Seminar, 2013.
- Dartmouth College, SIAM Chapter Lecture, 2012.
- Clarkson University, 2012, · Bates College, Lewiston, ME, 2009.
- [ECHO Cafe Scientifique](#), Burlington, VT 2011.
- [Language and Technology Linguistics Symposium](#), Middlebury College, Middlebury, VT 2012.

Forecasting Chaotic Physical Systems

- NCAR Mathematics & Climate Summer School, Boulder, CO, 2010.
- Dartmouth College, Mathematics Colloquium, Hanover, NH, 2009.
- Cornell University, Institute for Computational Sustainability, Math & Climate, 2009.
- UC Berkeley Climate Change Summer School, MSRI, Berkeley, CA, 2008.
- Bates College, Department of Mathematics, Lewiston, ME, 2008.
- National Weather Service, Burlington, VT, 2009.

Measuring the Emotional Impact of Songs, Blogs, and Presidents,

- Bowdoin College, Department of Mathematics, Brunswick, ME, 2008.
- Saint Michael's College, Department of Psychology, Colchester, VT, 2009.
- Dartmouth College, Computer Science, Hanover, NH, 2009.
- Cornell University, Institute of Computational Sustainability, Ithaca, NY, 2009.

Chaos and the Mathematics of Prediction: Harry Potter, Hurricane Katrina, and Happiness,

- MD/DC/VA MAA Sectional Keynote, George Mason University, Fairfax, VA. 2010.
- MATHCOUNTS, US Coast Guard Academy, New London, CT. 2009, 2010.
- Battles Keynote, MAA Northeast Sectional, Saint Michael's College, Colchester, VT. 2008.
- MAA Northeastern Sectional Dinner Meeting, Simmons College, Boston, MA. 2008.

Estimating and Correcting Weather Model Error, 2006

- European Geosciences Union, Nonlinear Processes Model Error Session, Vienna, Austria.
- Naval Research Laboratory Marine Meteorology Division, Monterey, CA.
- Center for Ocean-Land-Atmosphere Studies, Calverton, MD.
- Department of Atmospheric & Oceanic Sciences, University of Maryland, College Park, MD.
- National Centers for Environmental Prediction, Camp Springs, MD.

Testimony for Vermont Task Force on Artificial Intelligence, 2019.

What Twitter tells us about our Happiness, World Economic Forum, 2017.

Invocation, UVM College of Engineering & Mathematical Sciences Graduation Ceremony, 2014.

Chaos in an Atmosphere Hanging on a Wall, Mathematics of Planet Earth, 2013.

Cascading Failures: Extreme Properties of Large Blackouts in the Electric Grid

Math Awareness Month 2011, Complexity Essay, with Paul Hines

Chaotic Convection in a Toy Climate, Math Awareness Month 2009, Climate Change Essay.

SELECTED PRESS

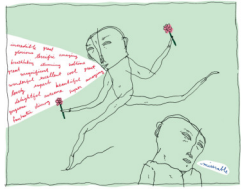
Using Data to Develop Personalized Recipes for Health
UVM Press Release. October 10, 2023.

Just how bad was this year?
Washington Post. December 31, 2020.



War in Ukraine has made Russian social-media users glum
The Economist. March 12, 2022.

Is Everybody Doing...OK?
Let's Ask Social Media
New York Times. October 12, 2020.



What Was the Happiest Day on the Internet This Decade?
The Ringer. March 5, 2019.

Whoooooa Duuuuude:
Why We Stretch Words in Tweets & Texts
Wired Magazine. May 27, 2020.



Your Instagram Posts May Hold Clues to Your Mental Health
New York Times. August 10, 2017.

Visiting a park boosts your happiness like Christmas morning, new research shows
Washington Post. August 21, 2019.

Researchers have quantified what makes us love Harry Potter
Washington Post. November 25, 2016.

Inside the Lab That's Quantifying Happiness
Outside Magazine. August 11, 2017.

Your Instagram feed can tell us if you're depressed
Washington Post. August 22, 2016.



According to the Words, the News Is Actually Good
New York Times. February 23, 2015.

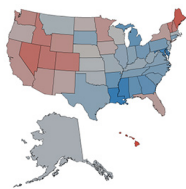
The Six Main Arcs in Storytelling, as Identified by an A.I.
The Atlantic. July 12, 2016.

If you're happy and you know it, write a tweet
NPR. February 10, 2015.

Seinfeld, Big Data & Measuring the Internet's Emotional Landscape
PBS Mediashift. March 16, 2015.

Languages Are Mostly Made of Happy Words
The Atlantic. February 11, 2015.

Spanish is the happiest language
Science Magazine. February 9, 2015.

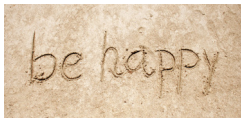


Where are the Happiest Tweeters?
Wall Street Journal. May 30, 2013.

Tomorrow's cities: How big data is changing the world
BBC News. August 27, 2013.

Amy Drinks in Napa
The Ellen Degeneres Show. February 28, 2013.

We're Happier When We're Farther From Home, Twitter Patterns Show
Discover Magazine. May 2, 2013.

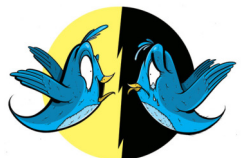


Happiest Cities on Twitter
NBC's Today Show. February 21, 2013.

Twitter study: Happiness rises the further you travel
BBC News. April 11, 2013.

Study of the Day: English Is an Overwhelmingly Positive Language
The Atlantic. January 23, 2012.

New Study Uses Tweets To Rank America's Happiest Cities, States
Time Magazine. February 25, 2013.



The Sentiments of Cities
Wired Magazine. January 5, 2012.

Happy Words Trump Negativity in the English Language
Wired Science, August 30, 2011.

The Geography of Happiness
The Atlantic. February 19, 2013.



Using Twitter as a Collective Mood Ring
New York Times. August 11, 2009.

The Design of Science: 10 Great Research Graphics
Wired Magazine. December 13, 2011.

Blogs: Happiness Barometers?
Science Magazine. August 7, 2009.

Social Scientists Wade Into The Tweet Stream
Science Magazine, September 30, 2011.

Does a Nation's Mood Lurk in its Songs and Blogs?
New York Times. August 3, 2009.

Hedonometer: Schott's Vocab Blog
New York Times. August 12, 2009.

How Happy is the Internet?
Science Magazine. August 3, 2009.

Taking the Pulse of Twitter
Wired Magazine, August 3, 2009.

CONSULTING	Quokka Labs, Burlington, VT.	2015-2022
	Social Sentinel, Burlington, VT.	2017-2018
	The MITRE Corporation, McLean, VA.	2009-2011

SERVICE	Examination Committees	University Committees
	20 PhD Thesis	Complex Systems Transdisciplinary Research Initiative
	30 Masters Thesis	Institute for the Environment University-Wide Task Committee
	40 Undergraduate Honors Thesis	Mathematics Graduate Program

Referee for academic journals:

Geophysical Research Letters	Proceedings of the National Academy of Sciences
Nature	Nature Scientific Data
Nature Computational Science	Nature Physics, Nature Human Behavior
Tellus, Chaos, Physica D	Proceedings of the Royal Society A
Scientific Reports, SIAM Review	Cognition & Emotion, Climate Dynamics
Digital Scholarship in the Humanities	Journal of Medical Internet Research
Monthly Weather Review	

Miscellaneous:

- PLoS ONE Editorial Board, Proposal review panelist for NSF, NASA.
- Captain of nationally ranked men's tennis team, Bates College, 2000/2001.

WORKSHOPS	<i>Network Frontier Workshop</i>	Northwestern, 2013.
	<i>Power Grids as Complex Networks</i>	Santa Fe Institute, 2012.
	<i>Data Assimilation and Climate Research</i>	NCAR, 2010.
	<i>The Mathematics of Terrorism</i>	Santa Fe Institute, 2009.
	<i>Connecting Weather and Climate in Theory, Models, & Observations</i>	NCAR, 2009.
	<i>Small Scales and Extreme Events: The Hurricane</i>	IPAM, UCLA, 2007.

FUNDING	• \$20M Harnessing the Data Revolution for Vermont: The Science of Online Corpora, Knowledge, and Stories, Co-PI, NSF EPSCoR, 2023-2028. • \$10M MassMutual Center of Excellence in Complex Systems & Data Science, PI, 2017-2028. • \$3M Lived Experiences Measured Using Rings Study, PI, MassMutual, 2022-24. • \$1M NSF MRI: Acquisition of a massive database to accelerate data science discovery 2021-2023. • \$1M Google Open-Source Complex Ecosystems and Networks (OCEAN) project, 2020-2022. • \$1M AMD Donates Computing Power to VACC for COVID-19 Research, PI, 2020-2021. • NSF-DMS grant <i>Collaborative Research: Mathematics and Climate Change Research Network</i>. September 1, 2010 - August 31, 2015, \$328,374, 5% academic year effort for UVM-PI Danforth. Established a Virtual Department of Climate Mathematics https://mcrn.hubzero.org • MITRE grant titled <i>Construction of hedonometer.org: An Instrument for Measuring Population-Level Sentiment in Real Time</i>. January 1, 2013 - December 31, 2013. \$380,000, 1/8 academic year + 1.5 summer months effort for Danforth, Joint PI w/Peter Dodds. • DARPA grant titled <i>Continually Plastic Modeling of Non-Stationary Systems</i>. September 1, 2011 - March 31, 2015, \$614,830, 1/8 academic year + 1/2 summer month effort for Co-PI Danforth. PI: Josh Bongard. • NASA-EPSCoR grant titled <i>Prediction and monitoring of ablation of thermal protective systems under atmospheric reentry conditions</i>. September 1, 2011 - December 31, 2014, \$750,000, 5% academic year effort for Co-PI Danforth. PI: Yves Dubief
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