Jaimie Murdock, Ph.D.

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EDUCATION

Doctor of Philosophy, Informatics and Cognitive Science   June 2019
Indiana University, Bloomington, IN
Dissertation: Topic Modeling the Reading and Writing Behavior of Information Foragers
Committee: Colin Allen (co-chair), Staša Milojević (co-chair), Michael Jones, Peter Todd
Concentration: Complex Networks and Systems

Bachelor of Science, Computer Science (with honors)   December 2010
Indiana University, Bloomington, IN
Concentrations: Artificial Intelligence and Programming Languages
Founder, Computer Science Club

Bachelor of Science, Cognitive Science   December 2010
Indiana University, Bloomington, IN
Co-chair, Midwest Undergratuate Cognitive Science Conference (MUCSC)
President, Student Organization for Cogntive Science (SOCS)

POSITIONS HELD

Sandia National Laboratory, Albuquerque, NM   October 2019 – present
Senior Member of Technical Staff   `https://sandia.gov/ccr/`
Machine Intelligence and Data Visualization Department

Cornell University, Ithaca, NY (remote)   January 2018 – October 2019
Web Applications Developer   `https://arXiv.org/`
Cornell University Libraries

Internet Archive, San Francisco, CA (remote)   March – December 2017
Web Crawl Engineer   `https://archive.org/`
Web Archiving & Data Services

Indiana University, Bloomington, IN   August 2011 – August 2013
Visiting Research Associate   `https://inphoproject.org/`
Cognitive Science Program

PUBLICATIONS

Journal Articles

[1] Jeffery Y. Tsao, Robert G. Abbott, Douglas Cale Crowder, Saaketh Desai, Remi P.M. Dingreville, James Elliott Fowler, Anthony Garland, Prasad P. Iyer, Jaimie Murdock, Scott T. Steinmetz, Kevin A. Yarritu, Curtis M. Johnson, and David J. Stracuzzi. "AI for Technoscientific Discovery: A Human-Inspired Architecture". *Journal of Creativity* 34.2 (2024), p. 100077. ISSN: 2713-3745. DOI: `10.1016/j.yjoc.2024.100077`. URL: `https://www.sciencedirect.com/science/article/pii/S2713374524000037`.

[2] Asmeret Naugle, Daniel Krofcheck, Christina Warrender, Kiran Lakkaraju, Laura Swiler, Stephen Verzi, Ben Emery, Jaimie Murdock, Michael Bernard, and Vicente Romero. "What can simulation test beds teach us about social science? Results of the ground truth program". *Computational and Mathematical Organization Theory* (2022). DOI: `10.1007/s10588-021-09349-6`.

[3] Colin Allen, Hongliang Luo, Jaimie Murdock, Jianghuai Pu, Xiaohong Wang, Yanjie Zhai, and Zhao Kun. "Topic Modeling the Hàn diǎn Ancient Classics (汉典古籍)". *Journal of Cultural Analytics* (2017). DOI: `10.22148/16.016`. arXiv: `1702.00860`.

[4] Jaimie Murdock, Colin Allen, Katy Börner, Robert Light, Simon McAlister, Robert Rose, Doori Rose, Jun Otsuka, David Bourget, John Lawrence, Andrew Ravenscroft, and Chris Reed. "Multi-level Computational Methods for Interdisciplinary Research in the HathiTrust Digital Library". *PLOS ONE* 12.9 (2017), e0184188. DOI: `10.1371/journal.pone.0184188`. arXiv: `1702.01090`.

[5] Jaimie Murdock, Colin Allen, and Simon DeDeo. "Exploration and Exploitation of Victorian Science in Darwin's Reading Notebooks". *Cognition* 159 (2017), pp. 117–126. DOI: `10.1016/j.cognition.2016.11.012`. arXiv: `1509.07175`.

[6] Jared Lorince, Sam Zorowitz, Jaimie Murdock, and Peter Todd. "Wisdom of the Few? "Supertaggers" in Collaborative Tagging Systems". *Journal of Web Science* 1.1 (2015). DOI: `10.1561/106.00000002`. arXiv: `1502.02777`.

Book Chapters

[7] Colin Allen and Jaimie Murdock. "LDA Topic Modeling: Contexts for the History & Philosophy of Science". In: *The Dynamics of Science: Computational Frontiers in History and Philosophy of Science*. Ed. by Grant Ramsay and Andreas De Block. Preprint: `http://philsci-archive.pitt.edu/17261/`. University of Pittsburgh Press, 2022.

[8] Jaimie Murdock, Cameron Buckner, and Colin Allen. "Evaluating Dynamic Ontologies". In: *Knowledge Discovery, Knowledge Engineering, and Knowledge Management: Second International Joint Conference, IC3K 2010, Valencia, Spain, October 25-28, 2010, Revised Selected Papers*. Ed. by Ana Fred, Jan L. G. Dietz, Kecheng Liu, and Joaquim Filipe. Vol. 272. Communications in Computer and Information Science. Springer-Verlag, 2013, pp. 258–275. DOI: `10.1007/978-3-642-29764-9_18`.

Conference Papers

[9] Jaimie Murdock, Colin Allen, and Simon DeDeo. "Quantitative and Qualitative Approaches to the Development of Darwin's Origin of Species". *Current Research in Digital History* 1 (2018). DOI: `10.31835/crdh.2018.14`. arXiv: `1802.09944`.

[10] Jaimie Murdock, Jacob Jett, Tim Cole, Yu Ma, J. Stephen Downie, and Beth Plale. "Towards Publishing Secure Capsule-Based Analysis". *2017 ACM/IEEE Joint Conference on Digital Libraries (JCDL)*. Toronto, Ontario, Canada, June 2017. DOI: `10.1109/JCDL.2017.7991585`.

[11] Jared Lorince, Sam Zorowitz, Jaimie Murdock, and Peter Todd. ""Supertagger" behavior in building folksonomies". *WebSci '14: Proceedings of the 2014 ACM Conference on Web Science*. Bloomington, Indiana, USA, June 2014, pp. 129–138. DOI: `10.1145/2615569.2615686`.

[12] Jaimie Murdock, Cameron Buckner, and Colin Allen. "Containing the Semantic Explosion". *Proceedings of the WWW2012 conference workshop PhiloWeb 2012: "Web and Philosophy, Why and What For?"* Ed. by Alexandre Monnin, Harry Halpin, and Leslie Carr. Vol. 859. CEUR Workshop Proceedings. Apr. 2012.

[13] Jaimie Murdock and Colin Allen. "InPhO for All: Why APIs Matter". *Journal of the Chicago Colloquium on Digital Humanities and Computer Science* 1.3 (Nov. 2011).

[14] Jaimie Murdock and Larry S. Yaeger. "Identifying Species by Genetic Clustering". *Advances in Artificial Life: 20th Anniversary Edition - Back to the Origins of Alife, ECAL 2011*. Paris, France: MIT Press, Aug. 2011, pp. 564–572.

[15] Jaimie Murdock, Cameron Buckner, and Colin Allen. "Two Methods for Evaluating Dynamic Ontologies". *Proceedings of the 2nd International Conference on Knowledge Engineering and Ontology Development (KEOD)*. Ed. by Ana Fred and Joaquim Filipe. Vol. 272. Revised and expanded in [8]. Valencia, Spain: Springer-Verlag, Oct. 2010, pp. 110–122. DOI: `10.5220/0003101601100122`.

Conference Abstracts

[16] James Pustejovsky, Marc Verhagen, Keongmin Rim, Yu Ma, Liang Ran, Samitha Liyanage, Jaimie Murdock, Robert H. McDonald, and Beth Plale. "Enhancing Access to Digital Media: The Language Application Grid in the HTRC Data Capsule". *PEARC '17: Proceedings of the Practice and Experience in Advanced Research Computing 2017 on Sustainability, Success and Impact*. Poster. New Orleans, Louisiana, USA, July 2017, 60:1–60:3. DOI: `10.1145/3093338.3104171`.

[17] Jaimie Murdock and Colin Allen. "Visualization Techniques for Topic Model Checking". *AAAI-15: Proceedings of the Twenty-Ninth AAAI Conference on Artificial Intelligence*. Demo of `https://hypershelf.org`. Austin, Texas, USA, Jan. 2015, pp. 4284–4285.

[18] Jaimie Murdock, Jiaan Zeng, and Robert H. McDonald. "Topic Exploration with the HTRC Data Capsule for Non-Consumptive Research". *JCDL '15: Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries*. Tutorial. Knoxville, Tennessee, USA, June 2015, p. 295. DOI: `10.1145/2756406.2756929`.

[19] Timo Sztyler, Jakob Huber, Jan Noessner, Jaimie Murdock, Colin Allen, and Mathias Niepert. "LODE: Linking Digital Humanities Content to the Web of Data". *JCDL '14: Proceedings of the 14th ACM/IEEE-CS Joint Conference on Digital Libraries*. Demo. London, United Kingdom, Sept. 2014, pp. 423–424.

[20] Jaimie Murdock, Robert Light, Colin Allen, and Katy Börner. "Mapping the Intersection of Science and Philosophy". *JCDL '13, Proceedings of the 13th ACM/IEEE-CS Joint Conference on Digital Libraries*. Poster. Indianapolis, Indiana, USA, July 2013, pp. 405–406. DOI: `10.1145/2467696.2467777`.

[21] Jaimie Murdock and Larry S. Yaeger. "Genetic Clustering for the Identification of Species". *GECCO '11. Proceedings of the 13th Annual Conference Companion on Genetic and Evolutionary Computation*. Poster. Expanded in [14]. Dublin, Ireland, July 2011, pp. 29–30. DOI: `10.1145/2001858.2001875`.

[22] Mathias Niepert, Cameron Buckner, Jaimie Murdock, and Colin Allen. "InPhO: A System for Collaboratively Populating and Extending a Dynamic Ontology". *JCDL '08: Proceedings of the 8th ACM/IEEE-CS Joint Conference on Digital Libraries*. Poster. Pittsburgh, Pennsylvania, USA, June 2008, p. 429. DOI: `10.1145/1378889.1378976`.

Miscellaneous

[23] Jaimie Murdock, Edward R. Carroll, and Kathryn Gray. *The Model Assessment Wizard (MAW): A Visualization System for Ontology Constraint Violations*. SAND2023-14860. Albuquerque, NM: Sandia National Laboratories, 2023. URL: `https://prod-ng.sandia.gov/sand_doc/2023/2314860.pdf`.

[24] Jaimie Murdock and Edward R. Carroll. *Simplifying and Visualizing the Ontology of Systems Engineering Models*. SAND2021-7079. Albuquerque, NM: Sandia National Laboratories, 2021. URL: `https://prod-ng.sandia.gov/sand_doc/2021/217079.pdf`.

[25] Jaimie Murdock. "Topic Modeling the Reading and Writing Behavior of Information Foragers". Chapters 4 and 5 published as [5, 9]. PhD thesis. Indiana University, June 2019. arXiv: `1907.00488`.

[26] Jaimie Murdock, Jiaan Zeng, and Colin Allen. *Towards Evaluation of Cultural-scale Claims in Light of Topic Model Sampling Effects*. Advanced Collaborative Support Technical Report. HathiTrust Research Center, June 2016. arXiv: `1512.05004`.

[27] Jakob Huber, Timo Sztyler, Jan Noessner, Jaimie Murdock, Colin Allen, and Mathias Niepert. *LODE: Linking Digital Humanities Conetnt to the Web of Data*. Expanded pre-print of abstract published in [19]. 2014. arXiv: `1406.0216`.

[28] Colin Allen, Jaimie Murdock, Cameron Buckner, and Robert Rose. "Computational Philosophy and the Examined Text: A Tale of Two Encyclopedias". *American Philosophical Association Newsletter on Philosophy and Computers* 12.2 (2013), pp. 28–30.

[29] Colin Allen and the InPhO Group. "Cross-Cutting Categorization Schemes in the Digital Humanities". *Isis* 104.3 (2013), pp. 573–583. DOI: `10.1086/673276`.

[30] Colin Allen, Jaimie Murdock, Cameron Buckner, and Scott Weingart. "An API for Philosophy". *American Philosophical Association Newsletter on Philosophy and Computers* 10.1 (2010), pp. 21–22.

TEACHING

Indiana University, Bloomington, IN

Foundations in Science and Mathematics
Introduction to Computer Science	June 2016
Introduction to Computer Science	June 2015

Department of History and Philosophy of Science and Medicine
HPSC-X420/X521 Computational Methods for HPS	January - May 2016

Cognitive Science Program
COGS-Q260 Programming for the Cognitive and Info. Sciences	January - March 2016
COGS-Q320 Computation in the Cognitive and Info. Sciences	March - May 2016
COGS-Q260 Programming for the Cognitive and Info. Sciences	January - March 2015
COGS-Q320 Computation in the Cognitive and Info. Sciences	March - May 2015

School of Informatics, Computing, and Engineering
INFO-I399 Research Methods	August - December 2013
CSCI-Y390 Independent Study	January - May 2013
CSCI-C343 Data Structures	August - December 2012
CSCI-C343 Data Structures	August - December 2010

PRESENTATIONS

AAAI Symposium on "Integrated Approaches to Computational Discovery" November 7, 2024
Using Reasoning to Evaluate Scientific Discoveries

International Council of Systems Engineers Symposium July 17, 2023
Lessons Learned from Defining an Applied Systems Engineering Ontology at Sandia National Labs

Digital History of Science Working Group at CHSTM November 3, 2021
The Origin of the Origin: Understanding Darwin's Delay through his Reading Notebooks

Workshop on Classifying Philosophy: Problems and Strategies March 31, 2021
Comparing Philosophy Categorization Systems

Current Research in Digital History 2018 March 17, 2018
The Development of Darwin's Origin of Species

Joint Conference on Digital Libraries 2017 June 20, 2017
Towards Publishing Secure Capsule-based Analysis

HTRC User Group Meeting March 2, 2017
HTRC Data Capsule - faster, bigger, better

Philosophy of Science Association 2016 Meeting November 4, 2016
Darwin's Semantic Voyage

Guest lecture in ILS-Z657 Digital Humanities November 3, 2016
From Texts to InPhO (and back!)

International Conference on Thinking 2016 August 4, 2016
The Cognitive Science of Darwin's Delay

HASTAC 2016 Workshop
From Texts to InPhO (and back!)
May 13, 2016

HASTAC 2016
Darwin's Semantic Voyage
May 12, 2016

Maryland Insitute for Technology in the Humanities (MITH) Staff Talk
Darwin's Semantic Voyage
Apirl 19, 2016

IU CCCP Lab Meeting
From Texts to InPhO (and back!)
April 13, 2016

IU Intelligent and Interactive Systems Seminar
Darwin's Semantic Voyage
March 23, 2016

Pestilli Research Laboratory
Topic Modeling: A Practical Introduction
March 4, 2016

IU Speech and Hearing Science Graduate Seminar
Visualizing Scientific Data
February 26, 2016

Guest Lecture in HPSC-X521 Digital Methods for HPS
Topic Modeling: A Practical Introduction
February 18, 2016

IU CCCP Lab Meeting
Topic Modeling: A Practical Introduction
February 10, 2016

HathiTrust Research Center User Group
Charles Darwin, Information Foraging, and Non-consumptive Research
November 11, 2015

Student Organization for Cognitive Science
Darwin's Semantic Voyage
October 27, 2015

CLingDing: IU Computational Linguistics Discussion Group
Darwin's Semantic Voyage
October 23, 2015

2015 Conference on Complex Systems (CCS'15)
Darwin's Semantic Voyage
October 2, 2015

Guest Lecture in STAT-S675 Statistical Learning
Exploration and Exploitation of Darwin's Reading Notebooks
September 11, 2015

International Center for Jefferson Studies Fellows' Forum
Polymathic and Polygraphic: Thomas Jefferson's Mind
June 4, 2015

Interactive Cognitive Systems Open House
Visualization Techniques for LDA
April 17, 2015

Goldstone, Landy, Todd Lab
Topic-Driven Foraging
April 10, 2015

IU SoIC Informatics PhD Un-poster Session
Darwin's Semantic Voyage
April 8, 2015

APA Pacific Division Invited Symposia
Comparing Topic Models of Digital Philosophy Resources
April 4, 2015

HathiTrust Research Center Uncamp
Topic Modeling with the HTRC Data Capsule
March 30, 2015

Network Science Talks @ IU
Topics Over Time: Into Darwin's Mind
March 9, 2015

IU Cognitive Computing Lab	November 5, 2014
Making Pretty Pictures w/Topic Models	
HathiTrust Research Center Uncamp	September 9, 2013
InPhO and HathiTrust: Digging for Philosophy in the Sciences	
International Association for Computing and Philosophy Annual Meeting	July 17, 2013
Simulating Expertise through Subcorpus Modeling	
Berkeley Institute of Design Lunch Series	August 7, 2012
A Tale of Two Encyclopedias	
WWW2012 Philoweb Workshop	April 17, 2012
Containing the Semantic Explosion	
IU Computer Science Club Tech Talk	November 17, 2011
Practical Parallelism	
IU Student Organization for Cognitive Science	November 15, 2011
Categorization	
Int. Conf. on Knowledge Engineering and Ontology Development	October 26, 2010
Two Methods for Evaluating Dynamic Ontologies	

AWARDS

Fellow, International Center for Jefferson Studies (ICJS)	May 2015
Provost's Award for Undergraduate Research and Creative Activity	April 2010
Cognitive Science Program Outstanding Contribution Award	April 2009
Hutton Honors College Arthur Metz Scholar	April 2007

CONSULTING

University of Pittsburgh	January 2019 - Present
The Internet Philosophy Ontology Project	`https://inphoproject.org`
University of Victoria	April 2015 - August 2017
Linked Modernisms	`http://linkedmods.uvic.ca`
Stanford University	June - August 2014
Stanford Encyclopedia of Philosophy	`https://plato.stanford.edu`
University of Alabama	October 2010 - August 2011
Syriac Reference Portal	`https://syriaca.org`
Logic Pedallers for McGraw-Hill	October 2008 - May 2009
Power of Logic Web Tutor	`http://www.poweroflogic.com`

MENTORING

Postdoc: Ryn Gray

Graduate (Sandia): Cengis Alkini, Ryn Gray

Graduate (InPhO Project): Aishwarya Iyer, Adithya Nagaraj Tirumale, Rohit Zawar

Undergraduate (Sandia): Ryan Roche

Undergraduate (InPhO Project): Evan Boggs, Tim Downey, Hannah Eli, Alex Frost, Lauren Gaynor, Bradi Heaberlin, Ram Iyer, Ryan Penelton, Wesley Pettyjohn, Jessie Pusateri, Loran Saggu, Kirtan Sakariya, Jesse Squires, Justin Stamets, Aish Thamba, Samuel Waggoner, Catherine Xu, Sara Zhang, Sam Zorowitz