

# BERNARD J. KOCH

## Computational Social Scientist & Sociologist

bernardkoch@ucla.edu

240-694-5019

[bernardjkoach.com](http://bernardjkoach.com)

[github.com/kochbj](https://github.com/kochbj)

[linkedin.com/in/bernardkoch](https://linkedin.com/in/bernardkoch)

### EDUCATION:

- Ph.D. in Sociology, University of California Los Angeles (2023 expected)
- C.Phil. in Sociology, University of California Los Angeles, 2020
- M.A. in Sociology, University of California Los Angeles, 2018
- B.A. in Biology with a Cognitive Science minor, Swarthmore College, 2013

### AWARDS:

- 2021 NeurIPS Datasets & Benchmarks Track, Best Paper (Top 2%)
- 2021, 2022 UCLA Sociology Sifton Undergraduate Research Mentorship Award
- 2018 California Workshop on Evolutionary Social Sciences Poster Award, 2<sup>nd</sup> Place
- 2014 NHGRI Genome Recognition of Employee Accomplishment and Talents Award (as team member)

### GRANTS, FELLOWSHIPS, and HONORARIA:

- University of California Dissertation Year Fellowship, 2022 (\$38,000)
- National Science Foundation Doctoral Dissertation Research Improvement Grant, 2021 (\$20,000)
- National Science Foundation Graduate Research Fellowship, 2018-2021 (\$138,000)
- Templeton Foundation Education Development Grant, Primary Investigator, Jun 2019 (\$5,700)
- University of California Graduate Research Mentorship Fellowship, 2017-2018 (\$38,000)
- University of California Graduate Summer Research Mentorship Fellowship, 2017, 2018 (\$12,000)
- University of California Dr. Ursula Mandel Scholarship, 2016 -2017 (\$15,000)
- University of California Dean's Scholar Award, 2016-2021 (~14,000, declined)
- Templeton Foundation Diverse Intelligence Summer Institute, Travel/Housing Full Scholarship, 2019
- Russell Sage Foundation Workshop for Social Science Genomics, Travel/Housing Full Scholarship, 2017

### PEER-REVIEWED PUBLICATIONS:

- Koch BJ, Denton E, Hanna A, Foster JG. Reduced, reused and recycled: The life of a machine learning dataset. *NeurIPS*:1-13 [oral, Best Paper Award], 2021. Media Coverage: [VentureBeat](#), [Alhub](#), [Unite.AI](#), [Mozilla](#)
- Jiang S, Koch BJ, Sun Y. HINTS: time series prediction via dynamic heterogeneous information network embedding. *WWW*:3158-3167, 2021.
- Brand JE, Xu J, Koch BJ, Geraldo PE. Uncovering sociological effect heterogeneity using tree-based machine learning. *Sociological Methodology*:189-223, 2021.
- Gjesfjeld E, Silvestro D, Chang J, Koch BJ, Foster JG, Alfaro ME. A quantitative workflow for modeling diversification in technological systems. *PLoS One*:1-16, 2020.
- Brand JE\*, Koch BJ\*, Xu J\*. Machine learning, in *SAGE Research Methods In the Social Sciences Foundation*:1-27, Paul Atkinson, Sara Delamont, Alexandru Cernat, Joseph W. Sakshaug, and Richard A. Williams. eds. 2020.
- Davidson PL, Koch BJ, Schnitzler CE, Henry JQ, Martindale MQ, Baxevanis AD, Browne WE. The maternal-zygotic transition and zygotic activation of the *Mnemiopsis leidyi* genome occurs within the first three

cleavage cycles. [Mol Reprod Dev.](#):1218–1229, 2017.

- Moreland RT, Nguyen AD, Ryan JF, Schnitzler CE, **Koch BJ**, Siewert K, Wolfsberg TG, Baxevanis AD. A customized web portal for the genome of the ctenophore *Mnemiopsis leidyi*. [BMC Genomics](#):1-13, 2014.
- Ryan JF, Pang K, Schnitzler CE, Nguyen A-D, Moreland RT, Simmons DK, **Koch BJ**, Havlak P, NISC Comparative Sequencing Program, Smith SA, Putnam N, Dunn CW, Wolfsberg TG, Mullikin JC, Martindale MQ, Baxevanis AD. The genome of the ctenophore *Mnemiopsis leidyi*. [Science](#):1336-1345, 2013.
- **Koch BJ**\*, Ryan JF\*, Baxevanis AD. The diversification of the LIM superclass at the base of the metazoa increased subcellular complexity and promoted multicellular specialization. [PLoS One](#):1-14, 2012.

\*denotes equal contribution

## UNDER REVIEW:

- **Koch BJ**, Silvestro D, Foster JG. The evolutionary dynamics of cultural change (as told through the birth and brutal, blackened death of Metal music). [Revise and Resubmit at the American Journal of Sociology](#).
- **Koch BJ**, Sainburg T, Geraldo PE, Jiang S, Sun Y, Foster JG. Deep Learning of Potential Outcomes. [Revise and Resubmit at Sociological Methods & Research](#).

## IN PROGRESS:

- **Koch BJ**, Dasgupta K, Panofsky A. White supremacy in an academic forest: does anyone hear it?
- **Koch BJ**, Peterson D. Deep learning as a vehicle for inequality in machine learning research.
- Peterson D, **Koch BJ**. The de-professionalization of medicine through artificial intelligence.

## INVITED TALKS:

- “Reduced, reused and recycled: The life of a machine learning dataset,” Apple University, virtual, Fall 2022.
- “The birth and brutal, blackened death of Metal music?” University of Toronto School of Cities, virtual, February 2022.
- “White supremacy in an academic forest: does anyone hear it?” UCLA Center for Behavior Evolution and Culture, virtual, October 2021.
- “Modeling the dynamics of cultural diversification,” Cultural Evolution Society/National Institute for Mathematical and Biological Synthesis, virtual, November 2020.

## CONFERENCE PRESENTATIONS:

- **Koch BJ**, Dasgupta K, Panofsky A. “White supremacy in an academic forest: does anyone hear it?” **ICS2S2 2022**, Chicago, July, 2022.
- **Koch BJ**, Dasgupta K, Panofsky A. “White supremacy in an academic forest: does anyone hear it?” **American Sociological Association, Main Session** on Science Knowledge and Technology, virtual, August 2021.
- **Koch BJ**, Sainburg T, Jiang S, Foster JG, Sun Y. “Deep Learning of Potential Outcomes,” **American Sociological Association, Main Session** on Methodology, San Francisco CA (virtual), August 2020.
- **Koch BJ**, Silvestro D, and Foster JG. “Evolutionary Dynamics of Cultural Change,” **American Sociological Association, Main Session** on Culture, San Francisco CA (virtual), August 2020.
- **Koch BJ**, Silvestro D, and Foster JG. “The Birth and Death of Cultural Things: Explaining Cultural Evolution Through Bayesian Analysis of Diversification Rates,” **American Sociological Association, Main Session** on Computational Sociology, New York NY, August 2019.
- **Koch BJ**, Silvestro D, and Foster JG. “The Birth and Death of Cultural Things: Explaining Cultural Evolution Through Bayesian Analysis of Diversification Rates,” **IC2S2**, Amsterdam NL, July 2019.
- **Koch BJ**, Silvestro D, and Foster JG. “The birth and (brutal, blackened) death of cultural things: a macroevolutionary history of metal music 1968-2000,” **Cultural Evolution Society**, Tempe AZ, October 2018.

**POSTERS:**

- **Koch BJ**, Sainburg T, Geraldo PE, Jiang S, Sun Y, Foster JG. "Deep Learning of Potential Outcomes," **IC2S2**, Chicago, July 2022..
- **Koch BJ**, Sainburg T, Geraldo PE, Jiang S, Sun Y, Foster JG. "Deep Learning of Potential Outcomes," **ICML Workshop on Causal Assumptions**, Virtual, August 2021.
- **Koch BJ**, Dasgupta K, Panofsky A. "White Supremacy in an Academic Forest: Does Anyone Hear It?" **Pre-ASA Workshop on Computational Sociology**, Palo Alto CA (virtual), August 2020.
- **Koch BJ**, Silvestro D, Foster JG. "The Evolution of Cultural Things: Diversity Dependence Among Metal Bands (1968- 2000)," **California Workshop for the Evolutionary Social Sciences**, Santa Barbara CA, May 2018.
- **Koch BJ**, Glassman SE, Roseman JE, DeBoer GE. "A Case Study in the Evaluation of Alignment to the Next Generation Science Standards using the EQulP Rubric," **The National Association For Research in Science Teaching Annual International Conference**, Chicago IL, April 2015.
- **Koch BJ**, Schnitzler CE, Gildea, DE, Henry JQ, Martindale MQ, Baxevanis AD, Browne WE. "Differential Gene Expression During Early Embryogenesis in the Ctenophore *Mnemiopsis leidyi*," **The Society for Integrative & Comparative Biology**, Austin TX, January 2014.

**COURSES TAUGHT:**

**Introduction to Computational Social Science**, Colby College, Winter 2022

Learning Goals:

- Learn to read and critique scientific papers (think like a scientist)
- Develop basic R programming skills
- Gain intuition for fundamental techniques in natural language processing, machine learning, and network science

**METHODS WORKSHOPS (lead/co-lead and organized):**

- Summer Institute in Computational Social Science (SICSS) at UCLA, 2 weeks, sponsored by California Center for Population Research (CCPR) and Russell Sage Foundation, Jun 2019, 2020, 2021.
- UCLA Computational Social Science Bootcamp, 1 week, sponsored by UCLA Sociology, Sep 2018.
- Word Embeddings for Social Science, 4 hr, UCLA BRITE Center, retreat, Sep 2018.
- Introduction to Text Analysis, sponsored by UCLA Library, 2hr, 2018.
- Introductory Programming for Text Analysis, UCLA Sociology, 2hr, May 2018 & Oct 18. • Python Programming for Biologists, National Human Genome Research Institute, weekly, Spring 2011.

**MENTORSHIP:**

- Emily Davidson (Undergraduate Research in Human Biology & Society) 2021
- Jumana Roufail (Undergraduate Research in Human Biology & Society) 2021
- Max Grollman (Undergraduate Research in Human Biology & Society) 2021
- Johnny Tu (Undergraduate Research in Human Biology & Society) 2021
- James Kimura (Undergraduate Thesis in Human Biology & Society) 2021
- Brandon Grayson (Undergraduate Thesis in Sociology) 2020-2021
- Hailey Boehm (Undergraduate Thesis in Sociology) 2020-2021
- Cheng Yi (Krystal) Xu (Undergraduate Research in Statistics) 2017-2018
- Jordan Jurczyk (Undergraduate Thesis in Sociology) 2018-2019
- Vinay Kumar (Undergraduate Research in Biology) 2018-2019
- Shawn Schwartz (Undergraduate Research in Biology) 2018-2019

**EMPLOYMENT/RESEARCH EXPERIENCE:****Spotify Research**, New York, NY, Summer 2022**Research Scientist PhD Intern**

- Working on understanding meaningful artist engagement through analysis of long-tail listening

**American Association for the Advancement of Science**, Washington DC, 2014-2016**Research Assistant**

- Designed and validated assessments to measure high school students' understanding of evolution.
- Managed random controlled trial study of biochemistry curriculum over a cohort of ~1000 students.
- Co-wrote & programmed instructional web app using NOAA weather data and Google Maps API
- Researched criteria for the evaluation of curricula in the context of national science education standards

**National Human Genome Research Institute/NIH**, Bethesda MD, 2010-2011, 2013-2014**Bioinformatics Fellow**

- Worked with a team of scientists on algorithmic identification of features in a newly sequenced genome
- Co-taught and organized introductory "Python Programming for Biologists" course for NHGRI fellows
- Chronicled evolution of protein structures throughout animal history using Hidden Markov Models
- Provided scientific programming support to non-computational laboratories

**National Cancer Institute/NIH**, Bethesda MD Summer 2010**Summer Intern**

- Worked on unpublished Bioconductor package to import biomedical publication metadata into R
- Developed techniques for detecting virus contamination in genomic sequencing data

**SERVICE:**

- UCLA Graduate Student Association Social Sciences Council, VP of Communications 2017-2019
- UCLA Sociology Graduate Association Treasurer & Social Sciences Council Representative 2016-2019

**REVIEWER:**

- *American Journal of Sociology*
- *American Sociological Review*
- *Poetics*

**SKILLS:**

- **Programming:** Python/pandas, R (fluent), Javascript, SQL, Bash (intermediate)
- **Deep Learning:** Tensorflow2, Pytorch (intermediate)
- **Supervised Machine Learning:** Standard models (LR, NB, SVM, RF, XGBoost, etc...)
- **Unsupervised Machine Learning:** Standard models (PCA, t-SNE, UMAP, Struct. topic models, Word vecs)
- **Network Science:** GNNs, Community detection, ERGMs, Centrality analyses
- **Bayesian Statistics:** Simple MCMCs with Gibbs Sampling
- **Causal Inference:** DL models for CI, Causal Trees/Forests, interpreting DAGs, other methods for obs. data
- **Regression:** GLMs, Mixed effect models
- **Languages:** English (fluent), Spanish (intermediate)