Adam Robert Pah, Ph.D.

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Education

Doctor of Philosophy in Interdisciplinary Biological Sciences 2008–2013
Certificate in Biotechnology
Northwestern University; Evanston, Illinois.
Thesis: "Cartography of metabolism and its uses in assessing data reliability and understanding cellular network functionality"

Bachelor of Science in Molecular Biosciences and Biotechnology 2004–2008
Arizona State University; Tempe, Arizona.
Graduated *Summa Cum Laude*

Positions

Clinical Assistant Professor 2015-Present
Dept of Management and Organizations, Kellogg School of Management
Northwestern University; Evanston, IL.

Assistant Research Professor 2015-Present
Associate Director
Northwestern Institute for Complex Systems (NICO); Evanston, IL.

Postdoctoral Fellow 2013-2015
Dept of Chemical and Biological Engineering at Northwestern University; Evanston, IL.

Postdoctoral Fellow 2013–2014
Dept of General Internal Medicine at Northwestern University; Chicago, IL.

Data Scientist 2013
TTX Corporation; Chicago, IL

Data Scientist 2012
Datascope Analytics; Chicago, IL

Grants, Awards, and Honors

Data Science Initiative Seed Grant 2017
Quantifying determinants of individual terrorist group lethality
Co-PI: Uzzi B
$45,000

Data Science Initiative Seed Grant 2016
Contributions of ethnic displacement to violence in the United States
Co-PIs: Amaral LAN and Hagan J
$50,000

Northwestern Graduate School (TGS) Travel Grant 2013

IBiS Departmental Travel Grant 2013

Chicago Biomedical Consortium Scholar 2011-2012

Northwestern Biotechnology Training Program Trainee 2009-2011
Northwestern University, NIH-funded

President's Scholarship 2004–2008
Arizona State University

Arizona State University Deans List 2004–2008

Publications

Albrecht KA, Hagan J, Amaral LAN, and **Pah AR**. Differential impact of race on the aspiration opportunity gap and gun violence at schools. (*In Preparation*).

Pah AR and Amaral LAN. Accounting for time-dependent rates in gun violence at schools nullifies contagion effects. (*In Preparation*).

Yang Y*, **Pah AR***, and Uzzi B. A Simple Model for Predicting the Shift to High Lethality in Terror Organizations. (*In Preparation*).

Bechel MA, **Pah AR**, Shi H, Mehrota S, Persell S, Baker D, Weiner S, Tulas K, Wunderink RG, Amaral LAN, and Weiss CH. The promise of data science: quantifying barriers to implementation of low tidal volume ventilation. (*Submitted*).

Pah AR, Hagan J, Jennings AL, Jain A, Albrecht KA, Hockenberry AJ, and Amaral LAN. (2017). Economic insecurity and the rise in gun violence at US schools. *Nature Human Behavior* 1, 0040.

Hockenberry AJ, **Pah AR**, Jewett MC, and Amaral LAN. (2017). Defining the anti-Shine-Dalgarno sequence and quantifying its functional role in regulating translation efficiency. *Open Biology* 7(1), 160239.

Burk D, **Pah AR**, Ruth JT. (2017). An analysis of muscoloskeletal injuries sustained in falls from the United States-Mexico border fence. *Orthopedics*, 40(3):e432-e435.

Kho AN, Cashy JP, Jackson KL, **Pah AR**, Goel S, Boehnke J, Humphries JE, Kominers SD, Hota BN, Sims SA, Malin BA, Meltzer D, Kaleba E, Jones R, and Galanter WL. (2015). Distributed Common Identity for Integration of Regional Health Data (DCIFIRHD). *Journal of American Medical Informatics Association*, DOI: 10.1093/jamia/ocv038.

Pah AR, Rasmussen-Torvik LJ, Goel S, Greenland P, and Kho AN. (2015). Big Data: What is it and what does it mean for cardiovascular research and prevention policy. *Current Cardiovascular Risk Reports* 9(1), 1-9.

Weiss CH, Poncela-Casasnovas J, Glaser JI, **Pah AR**, Persell SD, Baker, DW, Wunderink, RG, and Amaral, LAN. (2014). Adoption of a High-Impact Innovation in a Homogeneous Population. *Physical Review X* 4, 041008.

Pah AR, Guimera R, Mustoe AM, and Amaral LAN. (2013). Use of a global metabolic network to curate organismal metabolic networks. *Scientific Reports*, 3: 1695.

Daskalova SM, **Pah AR**, Baluch DP, and Lopez LC. (2009). *Arabidopsis thaliana* putative sialyltransferase resides in plant Golgi but lacks the ability to transfer sialic acid. *Plant Biology*, 11(3): 284–299.

Intellectual Property and Copyrights

"Technique for disaggregating and estimating Electronic Health Record case distribution geographically"
Inventors: Abel Kho, Adam Robert Pah, Satyender Goel, Jess J. Behrens
Serial No. 62/287,164

"A Tool for the Secure Aggregation of De-Identified Medical Data" 2014
Disclosure Number NU2014-141
IP Assigned to Health DataLink LLC

Talks

(2017). Mining small data: gun violence at schools since 1990. *Computational Research Day*, Evanston, IL.

(2016). Man + Machine: Thought Partnerships. *Program on Data Analytics at Kellogg Seminar*, Evanston, IL.

Pah AR and Amaral LAN. (2016). Are school shootings contagious? *International Conference on Computational Social Sciences*, Evanston, IL.

Uzzi B, Pah AR, and Yang Y. (2016). Are power laws the silver bullet to describe terrorism? A global scale analysis of terrorism. *International Conference on Computational Social Sciences*, Evanston, IL.

(2016). The rise of school shootings in K12 and post-secondary schools. *Wednesdays@NICO*, Evanston, IL.

(2015). Finding Needles in Haystacks: man + machine + web, *Kellogg Growth Day*, Evanston, IL.

Weiss CH, Poncela-Casasnovas J, Glaser JI, Pah AR, Persell SD, Baker, DW, Wunderink, RG, and Amaral, LAN. (2015). Adoption of a High-Impact Innovation in a Homogeneous Population. *Physics Meets the Social Sciences*, Granada, Spain.

Pah AR, Jennings A, and Amaral LAN (2015). Longitudinal analysis of shooting incidents at schools in the United States. *Computational Social Science Summit*, Evanston, IL.

Jackson K, Pah AR, Pacheco J, and Kho AN (2015). Effect of Care Fragmentation on Performance of Asthma Phenotype Algorithm Using Electronic Health Records. *American Medical Informatics Association - Clinical Research Informatics 2015*, San Francisco, CA.

Behrens J, Pah AR, and Kho AN (2015). Quantifying Geo-imputation Error: Using Gaussian Geostatistical Simulations (GGS) to Disaggregate Zip Code Data and Estimate Positional Error. *American Medical Informatics Association - Clinical Research Informatics 2015*, San Francisco, CA.

Pah AR, Behrens J, Goel S, and Kho AN (2014). Unzipping zip codes: A methodology to assign de-identified health data to smaller geographic localities. *American Medical Informatics Association - Clinical Research Informatics 2014*, San Francisco, CA.

Pah AR, Mustoe AM, Guimera R, and Amaral LAN. (2012). *Res Potentia* Networks: A route to understanding function and evolution of cellular networks. *NetSci 2012*, Evanston, IL.

Teaching

Human and Machine Intelligence, MORS 950 2017-

Instructor

Human and Machine Intelligence covers cutting edge research on machine-learning and artificial intelligence and its applications for business leaders. Machines help solve complex problems, lessen decision bias, scale human effort, and spot hidden patterns in big data. However, they lack the creativity and insight that top executives possess. Together, executives and machines have the potential to make powerful thought partnerships. Using hands-on cases and applications — including IBMs Deep Blue and Googles AlphaGo that beat Chess and Go Grand Masters — this course shows how to use a critical set of machine learning decision tools, such as natural language processing, sentiment analysis, and pattern recognition to discover new competitive strategies, turn raw numbers into convincing stories, and make less biased judgments. The overarching goal is to enable you to confidently lead data science and design teams, know the expansiveness and limits of machine-learning complex decision support tools, and be capable of applying human+machine thought partnerships to grow businesses or disrupt Grand Masters in any field.

Introduction to Programming for Big Data, NICO 101 2016-

Instructor

Big data is a challenge that exists in many disciplines and integrating its usage in research and analytics has numerous potential benefits. However, the skills necessary to utilize this data are not widely taught across all disciplines and hard to both access and independently master even with available online tools. I co-created this course for undergraduate and graduate students to teach the basics of programming and quantitative analysis using computers. This intensive 8-day course taught during the pre-term covered the basics of computer programming and advanced topics designed for use across all disciplines (text analysis, structured data analysis, web scraping, and image analysis).

Social Dynamics and Network Analytics, MORS 945 2016-

Instructor

Today's business leaders face unparalleled levels of connectivity and complexity. To help students meet these challenges, Social Dynamics and Networks Analytics provides an in-depth introduction to the emerging fields of social dynamics and network science including social networks, social media, tipping points, contagion, the wisdom of crowds, prediction markets, and social capital. Using simple yet powerful hands-on interactive models and exercises, the course covers both theory and applications of social dynamics for organizational growth, leadership, and competitiveness.

Northwestern Programming Bootcamp Fall 2014, Spring 2014, Fall 2015

Instructor

Each bootcamp enrolled 100 or more undergraduate or graduate students for a one-week intensive course on programming, data analysis, and data visualization. I helped organize the curriculum, integrate and distribute lecture content, and manage Teaching Assistants during daily activities. I also developed and delivered original lecture material on a number of topics.

Molecular Biology, BIOL_SCI 309 Fall 2010

Teaching Assistant

Led discussion section on original scientific research and findings related to Molecular Biology topics.

Genetics and Evolutionary Biology, BIOL_SCI 210 Fall 2009

Teaching Assistant

Led two lab sections in conducting experiments with model organisms.

Professional Service and Outreach

- Reviewer for Nature Communications, Proceedings of the National Academy of Science, Physical Review Journals (X, L, and E), Royal Society Interface, PLoS One, and Journal of Statistical Mechanics: Theory and Experiment.
- NICO 101: Introduction to Programming for Big Data instructor 2016
- Northwestern Computational Research Day Data Visualization Judge 2016
- Introduction to Programming and Data Science bootcamp instructor 2013-2016
- Northwestern Computational Research Day Session Chair 2015
- Northwestern Computational Research Day Poster Judge 2015
- IBiS Student Organization Invited Speaker Chair 2012
- Chicago Public School Annual Regional Science Fair Judge 2010-2013
- McCormick Engineering's Career Day for Girls Host 2009-2011, 2014

Mentored Students

Graduate:

- Kathryn Albrecht (2016-)
  Service: Vice President, Field Museum Women in Science

Undergraduate:

- Aditya Jain (2014-)
  Project: Automated identification of rare events through primary news sources
  Presented at: Out Four Undergrads Engineering Conference
  Awards: DAAD Rise Research Fellowship
- Andrew Jennings (2014-2016)
  Project: Longitudinal analysis of shooting incidents at schools in the United States
  Presented at: Northwestern Computational Research Day (Awarded 2nd Prize)
- Jaesuk Park (2014)
  Project: Geographic differences in hospitalization of asthma patients
  Presented at: Chicago Area Undergraduate Research Symposium

High School:

- Cary Li (2015)
  Project: Evaluating agent performance in growing networks
- Sarah Otis (2014)
  Project: Socioeconomic associations to differences in asthma hospitalization rates