

# AARON R. HILL

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## CURRENT APPOINTMENT

Parsons School of Design, School of Art, Media & Technology, New York, 2014-present. Assistant Professor of Data Visualization.

## EDUCATION

### Master of Science in Urban Policy Analysis and Management

The New School, Milano Graduate School for Management and Urban Policy. 2009

### Bachelor of Arts in Speech Communication

University of Southern Mississippi, School of Liberal Arts. 1998

## PROFESSIONAL POSITIONS

### Research Associate

MDRC, New York, 2007-2014

Quantitative researcher and analyst on two large randomized controlled trials in the United States and the United Kingdom to evaluate government programs for labor market retention and advancement. Headed a survey methodology initiative and created systems for knowledge and expertise in measurement of survey outcomes, scales, and validation.

### Part-time Faculty

The New School, New York, 2010-2014

Part-time lecturer of graduate level courses in statistics, data visualization, and statistical computing in R and SPSS. Nominated for Distinguished University Teaching Award, 2012.

## RECENT CONFERENCES, WORKSHOPS, AND TALKS

**Vera Institute of Justice** (2019). Workshop: *Data Visualization*. New York.

**IEEE VIS** (2018). *Seeking New Ways to Visually Represent Uncertainty in Data: What We Can Learn from the Fine Arts*. Conference presentation in the Visual Arts Program (VISAP) and paper published in conference proceedings. Berlin, Germany.

**Federal Reserve Bank of New York** (2018). Talk: *Machine Learning as Problem Solver*. New York.

**AAPOR 73rd Annual Conference** (2018). *Explorations of Uncertainty in Data Visualization*, conference presentation with Michael Schober, New School for Social Research. *Seeking New Ways of Representing Uncertainty in Data Visualization: A Review of Fine Art*, conference presentation with Clare Churchouse, Parsons School of Design. Denver, Colorado.

**Conference of the European Survey Research Association** (2017). *Communicating Uncertainty in Data Visualizations*, conference presentation with Michael Schober, New School for Social Research. Lisbon, Portugal.

**Federal Reserve Bank of New York** (2017). Talk: *Data Visualization: Past, Present, Future*. New York.

**Visualized** (2016). *Visual Display of Uncertainty*, a workshop. New York.

**Data Visualization Summit** (2016). *Data Visualization, Uncertainty, and Measurement Error*, an invited talk. Boston.

**Cannes Lions: International Festival of Creativity** (2016). *Data Visualization: of the people, by the people, and for the people*, an invited talk. Cannes, France.

**South By Southwest** (2015). *Data Visualization for Social Good*, a workshop. Austin, TX.

**New School Minute** (2015). *Seeing is Perceiving*. <https://youtu.be/wnEjVjZSxnY>

**New York Consortium of Evaluators** (2015). *Data Visualization: What is it and how can I use it in my evaluation work?* New York.

**SAS Global Forum** (2013). Contributed paper and presentation: *Destination Known, Programmatically Controlling Output in Enterprise Guide*. Awarded "Best Contributed Paper."

**Northeast SAS Users Group**, 25th Annual Conference (2012). Contributed paper and presentation: *Destination Known, Programmatically Controlling Output in Enterprise Guide*.

**Summer Conference of the Washington Statistical Society and the Washington-Baltimore Chapter of the American Association for Public Opinion Research** (2012). *Survey Research of Economic Incentives: Do Incentives Given Prior to a Survey Affect Participation in the Survey?*

**American Association for Public Opinion Research**, 67th Annual Conference (2012). Presented *Survey Research of Economic Incentives: Do Incentives Given Prior to a Survey Affect Participation in the Survey?*

**Association for Public Policy Analysis and Management**, 32nd Annual Research Conference (2010). Presented: *Rethinking Response Rates: New Evidence of Little Relationship between Survey Response Rate and Response Bias*.

**American Association for Public Opinion Research**, 65th Annual Conference (2010). Presented *Rethinking Response Rate Targets: New Evidence of Little Relationship Between Response Rate and Observable Response Bias*.

**Northeast SAS Users Group**, 22nd Annual Conference (2009). Contributed paper and presentation *Customizing a Correlation Matrix That Would Make Pearson Proud*.

## **CREATIVE AND TECHNICAL WORK: DATA VISUALIZATION**

**www.uncertainty.io** (2018-present). A resource contributing to a growing body of work on *visualizing uncertainty*. It serves as a repository of my research and creative practice work with collaborators.

**Visualizing Uncertainty design research tool**. 2018. A queryable interface to references and images of more than 400 works of fine art that have a unique ability to convey uncertainty using a range of approaches and techniques. <https://www.uncertainty.io/art/>

**Javascript open source repository for research and creative practice on visualizing uncertainty** (2017-present). Articulated visual language of core visual variables of interactive design and a set of new techniques and methods for calculating and expressing uncertainty and error. Includes the creation of an identity system for this work. <https://github.com/aaronxhill/uncertainty>

**Python repository for machine learning** (2017-2018). Visualization methods and resources to support the process of developing machine learning feature sets and tuning algorithms. [https://github.com/aaronxhill/ml\\_explore](https://github.com/aaronxhill/ml_explore)

**Greenwich Village Historic District Density Map** (2015). An interactive map featured on the website of the Greenwich Village Society for Historic Preservation. The map visualizes building density and age by block and lot in the Greenwich Village Historic District.

**Daily Attendance Chart for New York City Public Schools** (2014). A searchable chart for the Center for New York City Affairs at The New School. The tool displays attendance patterns for specific NYC public schools, showing the context of calendar and weather events throughout the academic year.

## **SELECTED RECENT PUBLICATIONS**

Hendra, R., & Hill, A. (2018). Rethinking Response Rates: New Evidence of Little Relationship Between Survey Response Rates and Nonresponse Bias. *Evaluation Review*. <https://doi.org/10.1177/0193841X18807719>

*What Strategies Work for the Hard-to-Employ?: Final Results of the Hard-to-Employ Demonstration and Evaluation Project and Selected Sites from the Employment Retention and Advancement Project*. David Butler, Julianna Alson, Dan Bloom, Victoria Deitch, Aaron Hill, JoAnn Hsueh, Erin Jacobs, Sue Kim, Reanin McRoberts, and Cindy Redcross. May 2012. New York: MDRC.

*Breaking the Low-Pay, No-Pay Cycle: Final Evidence from the UK Employment Retention and Advancement (ERA) Demonstration*. Richard Hendra, James A. Riccio, Richard Dorsett, David H. Greenberg, Genevieve Knight, Joan Phillips, Philip K. Robins, Sandra Vegeris, and Johanna Walter, with Aaron Hill, Kathryn Ray, and Jared Smith. August 2011. New York: MDRC.

*Paths to Advancement for Single Parents*. Cynthia Miller, Victoria Deitch, and Aaron Hill. November 2010. New York: MDRC.

*Policy Brief: Can Low-income Single Parents Move Up in the Labor Market?: Findings from the Employment Retention and Advancement Project*. Cynthia Miller, Victoria Deitch, and Aaron Hill. November 2010. New York: MDRC.

*How Effective Are Different Approaches Aiming to Increase Employment Retention and Advancement?: Final Impacts for Twelve Models*. Richard Hendra, Keri-Nicole Dillman, Gayle Hamilton, Erika Lundquist, Karin Martinson, and Melissa Wavelet with Aaron Hill and Sonya Williams. April 2010. New York: MDRC.

## **TEACHING**

Nominated for Distinguished University Teaching Award, 2018, 2019.

**Data Structures** (PSAM 5600: Spring 2015; PGDV 5110: Fall 2015, Fall 2016, Fall 2017, Fall 2018)

Students complete two major computing projects that require exploration of issues related to technology, speed, efficiency, and the broader ethical considerations of what it means to represent and make conclusions about groups and individuals from their data. Assigned readings and seminar discussions address underlying computer science theory and practice.

**Machine Learning** (PSAM 5600: Spring 2016; PGDV 5010: Spring 2017, Spring 2018, Spring 2019)

Using data from digital imagery and natural language text, students apply supervised and unsupervised machine learning methods to complete projects on image recognition, recommendation engines, and language processing. The assignments support a process to uncover complex patterns in massive amounts of data to make more accurate predictions and to reveal coherent patterns. Assigned readings and seminar discussions address underlying machine learning science theory and practice.

**Visualizing Uncertainty**, co-taught with Michael Schober (GPSY 6422: Fall 2016, Spring 2018)

This seminar brings together graduate students in data visualization and psychology to investigate new ways of representing and hypothesizing about data while rigorously questioning what conclusions can legitimately be drawn. Psychology and data visualization students are paired to carry out two hands-on projects over the semester, gaining experience in communicating with collaborators with quite different backgrounds and expertise.

### **Creative Computing** (PUCD 2035: Fall 2014)

Students with no prior coding experience learn visual expression and representation through programming and computational media. They learn fundamental interaction design principles that can be applied across a range of platforms. Students are encouraged to experiment with various media, tools, and techniques, ultimately producing a portfolio of interactive and visual projects designed for the screen.

### **Quantitative Methods** (NURP 5013: Spring 2010, Fall 2010, Spring 2011, Summer 2011, Fall 2011, Fall 2012, Spring 2013, Summer 2013, Spring 2014, Spring 2015, Spring 2016)

Students learn fundamental statistical methods and how to apply them to policy analysis and management decision-making. They develop an appreciation for statistics, develop statistical literacy, learn to apply statistical techniques properly, gain skills with statistical software, and acquire the skills necessary to look at statistical analyses critically.

### **Data Visualization** (NURP 5028: Fall 2013, Fall 2014)

Students learn core data visualization theory and a range of visual and design techniques to describe, explore, and summarize data.

### **Independent Study**

- Ian Smith: *Simulation of active satellites orbiting Earth*. PGDV 5900, Spring 2016.
- Barbara Compagnoni: *Streams of biometric data*. PGDV 5900, Spring 2016.
- Andrew Garon: *Data infrastructure and efficiency*. NURP 6900, Fall 2015.

### **Guest Lectures**

- *Data Visualization* (2017). English Language Studies Department, pilot pre-college program of intensive English for Brazilian women.
- *Machine Learning Fundamentals* (2017). Course: PGTD 5101 Projects Studio 2: Emergent Forms, Anthony Dunne and Fiona Raby.
- *Machine Learning Fundamentals* (2017). Course: PSDS 5330 Designing A.I., David Young.
- *Data Visualization* (2017). Course: Fundamentals of Data Visualization, Open Campus.
- *Data Visualization* (2014). ULEC: Mass Observation.

### **Guest Crits**

- PGTD 5101 Projects Studio 2: Emergent Forms, Anthony Dunne and Fiona Raby, Spring 2017.
- PSDS 5330 Designing A.I., David Young, Spring 2017.
- PGDV 5200 Major Studio 1, Fall 2015, Fall 2016, Spring 2017.
- PGDV 5210 Major Studio 2, Spring 2016, Spring 2017.
- BFA Communication Design thesis, Spring 2015.

## **UNIVERSITY SERVICE**

**Towards a complete history of art: Building an interface that connects museum data internationally.** 2019. Funded by the National Endowment for the Humanities. Delivered machine learning workshop to support the development of a design document for a digital platform that connects museum data internationally using the data provided by museums.

**Migration Across Media Workshop.** 2019. Funded by the Zolberg Institute on Migration and Mobility. Participant in an interdisciplinary workshop on displacement and emplacement in movement and migration.

**The New School in Shenzhen.** 2018-2019. Contributor to the *Parsons Shenzhen Feasibility Study*, proposing a campus to the Chinese government which would include a new Master's program in data visualization.

**Progress of the World's Women report for the United Nations.** 2018-2019. Serving as Project Data Scientist for the Center for Data Arts, the funding recipient.

**Save Your Scholarship! Web Archiving and Tools for Preserving Research Resources.** 2018. Organized and hosted a workshop led by Frick Art Reference Library staff Deborah Kempe, Chief, Collections Management and Access, and Sumitra Duncan, Head, Web Archiving Program on web archiving, effectively managing permanent citations in research, and introducing tools for preserving born-digital art research materials for the future scholar.

**Multidisciplinary Methods Intensive workshop for the China India Scholar-Leaders Initiative (CISLI) New York City Residency.** 2018. Led two methods sessions on data visualization.

**Mapping the Impact of The New School Alumni,** a research project for The New School Centennial. 2018-2019. Funding support by the Provost's Office to the Entrepreneurial Genome Project in the School of Design Strategies.

**Collaboratory Symposium.** 2018. Contributor to the day-long symposium in which academics and activists deep-dive into questions around socially engaged learning, practice, and scholarship. Hosted by the Collaboratory, a New School network of faculty, students and community partners at the forefront of innovative approaches and practices to creating a more just, resilient, and equitable society.

**REPLAY Sound the Mound.** 2017-2018. Collaborator in a course partnership with Freshkills Park and Arable Labs that addresses complex issues of climate, waste management, landfill reclamation, cellular technology, public art, parks and the visualization and sonification of data.

**Management Initiative,** Provost's office of Curriculum and Learning. 2017-2018. Participated in a working group of program directors and chairs from across management programs to review and expand on a shared lexicon of management learning outcomes.

**Shared Master's Platforms,** participant. 2017. Provost's Office initiative to explore the development of shared masters platforms across the University.

**Academic Consortium with Cornell Tech,** advocating for a consortium of STEAM programs at Parsons and related programs at Cornell Tech. 2017-2018.

**Visualized Conference,** organizer. 2016.

**Search, Professor of Interaction Design,** committee member. 2016. A search for two positions led to four hires.

**Perceptive Content Initiative,** participant. 2016. Faculty review of options for upgrading or replacing Perceptive Content for admission review.

**Director, M.S. Data Visualization,** 2015-present.

**Leadership Council, School of Art, Media, and Technology,** member. 2015-present.

**Search, PIIM Director,** committee member. Led to the hire of Ben Rubin to the Center for Data Arts. 2015.

**Organizing Committee for the National Science Foundation Polar Cyberinfrastructure Data Visualization Hackathon,** member. 2014.

**Curriculum Committee, School of Art, Media, and Technology,** member. Fall 2014.

**Developed new master's program,** 2013-2015. Approval from the New York State Department of Education (NYSED) and the National Association of Schools of Art and Design (NASAD). The program launched Fall 2015.



## **PROFESSIONAL SERVICE AND AFFILIATIONS**

**Meetup: Data Visualization New York**, co-organizer. 2016-present. ~6,000 members. Parsons hosted events:

- Data Visualization Keynotes at Parsons Festival
- Howard Wainer: Historical development of W.E.B. Du Bois' graphical narrative
- Nemil Dalal: The Visualization of Deaths in The New York Times
- Hadley Wickham: Nine visualisation challenges
- Digital Echoes: Understanding Patterns of Mass Violence with Data and Statistics
- Kaiser Fung: What I Learned from Ten Years as a Datavis Critic

**IEEE**, member. 2016-present. Computer Society Technical Committee on Visualization and Graphics.

**New York City Data Science Task Force**, participant. 2016. Business-Higher Education Forum initiative funded by the Alfred P. Sloan Foundation to align undergraduate education with emerging workforce needs in data science in New York City.

**New York City Area Digital Art History Colloquium**, participant. Organized by Columbia University and The Frick Art Reference Library. 2015.

**American Association of Public Opinion Research and its New York chapter**, member. Committee member, AAPOR Online Education Sub-committee. 2012-2016.

## **PROGRAMMING LANGUAGES**

**Statistical computing and machine learning:** Python (base Python 2.x and 3.x, numpy, Pandas, scikit-learn), Spark, R, SAS, SPSS

**Visualization and computational media:** JavaScript, Node.js, D3

**Data wrangling:** SQL, MongoDB, Perl Regular Expressions

**Physical computing:** Arduino language, Particle Photon