William T. Adler, Ph.D.

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Selected professional experience

Computational Research Specialist (2018 – present); Princeton Gerrymandering Project; Center for Information Technology Policy; Princeton University; Princeton, NJ

- Empower citizens with tools necessary to understand district maps and fairness in redistricting. Develop tools to aid the collection, organization, cleaning, and sharing of election precinct geographies. Study methods to detect outlier district maps. Wrote peer-reviewed paper (see below).
- Assist a NJ assemblyman and legislative staff on drafting the Voting Precinct Transparency Act, a bill requiring the state to share election data and precinct geographies, after each election, on a publicly available website.
- Analyze the likely effects of proposed legislation to reform redistricting, in partnership with legal organizations such as Common Cause and League of Women Voters, e.g., by providing reports and interactive simulations to demonstrate possible outcomes, and testifying in state houses to support said analysis. Consult with reform organizations working to change redistricting laws at the state level, e.g., by partnering with OneVirginia2021 to redraw part of Virginia's state house map, writing an opinion piece in Virginia's largest daily newspaper, the *Virginian-Pilot*, and providing an open data project about the map and related litigation. Give talks about redistricting and redistricting reform.
- Advise undergraduate and master's students, e.g., in a semester-long project to draft a report guiding the upcoming implementation of the independent citizens' redistricting commission in Michigan.
- Wrote popular press piece in the *New York Times*. Provide interviews, data, and research to press outlets, including the *New York Times* (1, 2, 3), *WNYC*, *POLITICO*, *Philadelphia Inquirer*, *Washington Post*, *NJ Spotlight*, *CNN*, *Yahoo News*, *NJ 101.5*, *Politifact*, *WESA*, *Virginia Mercury*, and *Folha de S. Paulo*.

Education

Ph.D., Neural Science (2013 – 2018); New York University; New York, NY

- Dissertation: Computational mechanisms underlying human confidence reports.
  - Advisor: Wei Ji Ma; Committee chair: Eero P. Simoncelli
  - Developed computational models of human confidence and Bayesian inference, producing three peer-reviewed first-author papers (see below) and four conference presentations.
  - Shared all data and code publicly on GitHub.

B.A., Psychology (2006 – 2010); Carleton College; Northfield, MN

- Completed senior thesis consisting of an original empirical study of rhythm and working memory.
- Awarded distinction in the senior thesis and in the major.
- Graduated *magna cum laude*.

Honors and awards

National Science Foundation Graduate Research Fellow (2015 – 2018)

- $136,000 grant providing tuition and stipend for the majority of my graduate training.

NYU President's Service Award (2018)

- Awarded for commitment to civic engagement and service, for founding and running the Scientist Action and Advocacy Network (see below).

New York Academy of Sciences Science Alliance Leadership Training Fellow (2017)

NYU Dean's Outstanding Graduate Student Teaching Award in the Sciences (2016)

- $1,000 award to one graduate student teaching assistant each year for excellent teaching, based on student testimonials and a teaching statement.

Peer-reviewed publications (* indicates equal contributions)

Adler, W.T., Wang, S.S.-H. (2018). Response to Cho and Liu, "Sampling from complicated and unknown distributions: Monte Carlo and Markov chain Monte Carlo methods for redistricting." *Physica A: Statistical Mechanics and its Applications.*

Adler, W.T., Ma, W.J. (2018). Comparing Bayesian and non-Bayesian accounts of human confidence reports. *PLOS Computational Biology.*

Denison, R.N.*, **Adler, W.T.***, Carrasco, M., Ma, W.J. (2018). Humans incorporate attention-dependent uncertainty into perceptual decisions and confidence. *Proceedings of the National Academies of Sciences.*

Adler, W.T., Ma, W.J. (2018). Limitations of proposed signatures of Bayesian confidence. *Neural Computation.*

Platt, M.P.*, **Adler, W.T.***, Mehlhorn, A.J.*, Johnson, G.C., Wright, K.A., Choi, R.T., Tsang, W.H., Poon, M.W., Yeung, S.Y., Waye, M.M.Y., Galaburda, A.M., Rosen, G.D. (2013). Embryonic disruption of the candidate dyslexia susceptibility gene homolog *Kiaa0319-like* results in neuronal migration disorders. *Neuroscience.*

Adler, W.T.*, Platt, M.P.*, Mehlhorn, A.J.*, Haight, J.L., Currier, T.A., Etchegaray, M.A., Galaburda, A.M., Rosen, G.D. (2013). Position of neocortical neurons transfected at different gestational ages with shRNA targeted against candidate dyslexia susceptibility genes. *PLOS ONE.*

Non-academic publications

Adler, W.T. , Thompson, S.A. (2018, November). The 'blue wave' wasn't enough to overcome Republican gerrymanders. *The New York Times.*

Williams, B., **Adler, W.T.** , Wang, S.S.-H. (2018, August). Lawmakers should fix inequitable district lines. *The Virginian-Pilot.*

Adler, W.T. (2018, April). Here's how scientists can become more politically engaged [blog post]. *Scientific American.*

Selected presentations

Adler, W.T. (2018, October). An open-source approach to advancing redistricting reform: Virginia as case study. Invited talk presented at the Quantifying Redistricting workshop, Duke University, Durham, NC.

Adler, W.T., Denison, R.N., Carrasco, M., Ma, W.J. (2017, September). When making confidence judgments, people take into account bottom-up and top-down stimulus uncertainty [poster]. [brief abstract]. Poster presented at the Cognitive Computational Neuroscience Meeting, New York, NY.

Volunteer and policy experience

Founder, **Scientist Action and Advocacy Network (ScAAN)** (2016 – present)

- In 2016, I founded ScAAN, a group of scientists who partner with organizations that are creating positive social change. We have provided pro bono scientific consulting to several organizations, providing data analysis, visualization, and brief, targeted literature reviews.
- Example projects: the development of an interactive map about the NYC waterfront, produced in partnership with the NYC Environmental Justice Alliance; a literature review about adolescent development, produced in partnership with Raise the Age NY in their successful push for a law to raise the age of criminal responsibility in New York from 16 to 18.
- ScAAN continues to meet under a new president now that I have left NYU; about 20 members meet every other week to work on various ongoing projects.
- We have been covered by the *Stanford Social Innovation Review* and the *APA Monitor on Psychology*.

Proposal Reviewer, **Google AI Impact Challenge** (2019)

Society for Neuroscience Early Career Policy Ambassador (2017)

- I met with U.S. senators, representatives, and their staff on Capitol Hill, advocating for specific science funding policies. I also led a group meeting with a senator's local office staff.

Data Scientist, **DataKind** (2017)

- DataKind organizes short- to medium-term projects that pair volunteer data scientists with nonprofit organizations and municipalities.
- For 6 months, I and one other data scientist worked directly with an education startup that tracks college persistence. We cleaned and combined data from several disparate sources and provided the organization with novel and simple ways to access and visualize their data. Finally, we built a model that could estimate the probability of student dropout using easily available variables such as high school GPA, enabling the client to scale their student coaching program.

Mentor, **iMentor** (2015 – 2017)

- I was paired with a public high school student in Brooklyn. My goal was to help guide him through the long and complicated college and financial aid application process.

Educator, Neuroscience Outreach Group at NYU (2013 – 2016)

- I designed and presented fun hands-on neuroscience demonstrations, making over two dozen classroom presentations to students ranging from kindergarten to high school.

Teaching experience

Head Teaching Assistant (2015); *Introduction to Neural Science;*
Center for Neural Science, Department of Biology; New York University

- Taught weekly recitation sections, and gave lectures on perceptual neuroscience.
- Wrote and graded student exams and homework, and met with students as necessary.
- Organized meetings and logistics with the professor and the other teaching assistants.

Teaching Assistant (2014); *From Illusions to Inference: Adventures in Human Perception;*
Center for Neural Science; New York University

- Taught weekly recitation sections.
- Wrote and graded student exams and homework, and met with students as necessary.

Technical Skills

- Python, including:
  - Statistical and scientific computing packages such as NumPy, SciPy, Pandas, scikit-learn
  - Visualization packages such as Matplotlib, Seaborn, Plotly, Folium
  - Geographic information system (GIS) packages such as GeoPandas, Shapely, PySAL
  - Web scraping packages such as BeautifulSoup
- HTML/CSS, Adobe Photoshop/Illustrator/InDesign
- Open source software best practices, including use of Git and GitHub
- Statistics, numerical computing and optimization, Markov chain Monte Carlo (MCMC) sampling, Bayesian modeling
- GIS programs such as QGIS, ArcGIS, Maptitude
- Parallel computing