

Neeti Pokhriyal, PhD

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Professional Experience

National Science Foundation AAAS Science and Technology Policy Fellow National Artificial Intelligence Research Institutes Program Directorate for Computer and Information Science and Engineering	September 2022 - present
The National Academies of Sciences, Engineering, and Medicine, DC Mirzayan Science and Technology Policy Fellow Committee on National Statistics Project: Toward a Vision for a New Data Infrastructure for Federal Statistics and Social and Economic Research in the 21st Century	March 2022 - August 2022
Dartmouth College, NH Visiting Scholar, Department of Computer Science (CS) Postdoc , Department of Computer Science jointly with Prof. Soroush Vosoughi (in CS) and Prof. Benjamin Valentino (in Government) Associate Affiliate, Irving Institute for Energy and Society	Oct 2021 - present Oct 2019 - Sept 2021 July 2020 - Sept 2021
Inter-American Development Bank, DC Consultant	Jan 2019 - Dec 2019
University at Buffalo, The State University of New York, NY Graduate Research Assistant, Department of Computer Science & Engineering	Jan 2014 - Sept 2019
Oak Ridge National Laboratory, Oak Ridge, TN Researcher, Computer Science and Mathematics Division	July 2012 - April 2013
University of California, Riverside, CA Graduate Research and Teaching Assistant, Department of Computer Science	Sept. 2008 - Dec. 2009
Tata Consultancy Services, Mumbai, India Assistant Systems Engineer, Nortel Technology Laboratory.	Sept. 2005 - Oct. 2007

Education

PhD , Computer Science & Engineering University at Buffalo, The State University of New York Dissertation Title: Learning from Disparate Data: Applications in Biometrics & Sustainability <i>The thesis proposed novel methods to jointly learn from noisy, uncertain, and high-dimensional data coming from multiple sources, sensors, or modalities for tackling problems in biometric identification and sustainable human development.</i>	Aug 2013 - Sept 2019
Masters, Computer Science University of California, Riverside Thesis Title: Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning <i>The thesis proposed a computational framework to discover novel genes in the human malaria parasite genome using nucleosome positioning data.</i>	April 2008 - Dec. 2009
Bachelors in Computer Engineering, with Honors Aligarh Muslim University, India	July 2001 – May 2005

Funding secured

1. Mapping Country-wide Energy Access for the Majority World

Awarded by: Irving Institute of Energy and Society, Dartmouth College

As **Principal Investigator** for **USD 31,000 (100% share)** from July 2020 - Sept 2021.

Goal: Designing a novel computational model to now-cast energy access for developing countries for policy planning.

2. Financial Services for the Poor (OPP1114791)

Funded by: Bill and Melinda Gates Foundation

As **Project Lead**, University at Buffalo, for **USD 20,000 (100% share)** from June 2015 - Dec 2016.

Goal: Building algorithms to map poverty at policy-planning regions using mobile phone and satellite data.

3. Multi-dimensional poverty mapping from mobile phone data on the OPAL platform

Funded by: Overseas Development Institute (ODI), UK

As **Senior Personnel** for **USD 15,000 (100% share)** from Feb 2019 - August 2019.

Goal: Building novel algorithms that use mobile phone data in a privacy-preserving manner to map poverty.

Recent Awards

1. Mirzayan Science and Technology Fellowship, National Academies of Sciences, March 2022.

A highly competitive fellowship (<10% acceptance) that exposes fellows to science policy at the federal level.

2. Chih Foundation Research and Publication Award, University at Buffalo, NY, May 2019.

This is a single award of USD 2,500/year given each year for doctoral research related to innovation for the betterment of society at the University at Buffalo, State University of New York.

3. Doctoral Consortium Scholarship for AAAI Conference on Artificial Intelligence, Jan 2019.

4. Winner - National Statistics Prize & USD 2,000 prize, Data for Development (D4D) Challenge International Conference on the Analysis of Mobile Phone Datasets, MIT, 2015.

5. Finalist, 3 Minute Thesis (3MT), University at Buffalo, 2019.

6. Travel Support to attend International Conference on Computational Sustainability, Cornell 2016.

7. Dean's Distinguished Fellowship Award at University of California, Riverside, 2008.

Policy experience

1. National Science Foundation:

- (a) I am part of the leadership team for the **ExpandAI program**, whose aim is to expand AI research and workforce development for underserved communities through capacity building and partnerships with the National AI Research Institutes program. I coordinate efforts to manage the proposals, conduct reviews and coordinate efforts across the different directorates at NSF related to the program.
- (b) I contribute to the **NSF's National AI Research Institutes** program, which funds long-term, high-reward AI research by engaging in inter-agency partnerships and in developing future solicitations.
- (c) I have assisted the leadership at the Information and Intelligent Systems division at Computer, and Information Science and Engineering directorate, NSF in developing a policy paper in coordination with other agencies and working groups like the Networking and Information Technology Research and Development.
- (d) As an **AAAS science and technology policy (STPF)** fellow, I participate in professional development activities. Some of the recent ones that I have completed are program management, program evaluation, and policy negotiation across the US government.

2. National Academies of Sciences, Engineering, and Medicine:

- (a) I contributed to the **Committee on National Statistics** on the project titled, "Toward a Vision for a New Data Infrastructure for Federal Statistics and Social and Economic Research in the 21st Century". I researched and contributed to aspects of **sustainable models of data sharing, data equity, and privacy-preserving methodologies**. I contributed to another NAS report (*forthcoming*) by working on a chapter on the use of multiple datasets for agricultural statistics.
- (b) I learned skills like consensus-building across diverse stakeholders and how to effectively communicate science to policymakers.

Peer-Reviewed Academic Journals

9. [Accurate Intercensal Estimates of Energy Access to Track Sustainable Development Goal 7](#), **N. Pokhriyal**, Emmanuel Letouzé, Soroush Vosoughi, EPJ Data Science, 2022. (Impact factor: 5.4)
8. [An interpretable model for real-time tracking of economic indicators](#), **N. Pokhriyal**, B. Valentino, S. Vosoughi, Association for Computing Machinery (ACM) Transactions on Data Science, 2021.
7. [Combining disparate data sources for improved poverty prediction and mapping](#), **N. Pokhriyal**, D. Jacques, **Proceedings of the National Academy of Sciences (PNAS)**, 2017. (Impact factor: 12)
6. [Estimating and Forecasting Income Poverty and Inequality in Haiti Using Satellite Imagery and Mobile Phone Data](#), **N. Pokhriyal**, O. Zambrano, J. Linares, H. Hernández *Working Paper*, Inter-American Development Bank, 2020.
5. [Learning from disparate data: Applications in Biometrics and Sustainability](#), **N. Pokhriyal**, PhD thesis, University at Buffalo, State University of New York, 2019.
4. [Learning Discriminative Factorized Subspaces with application to Touchscreen Biometrics](#), **N. Pokhriyal**, V. Govindaraju, IEEE Access, 2020. (Impact factor: 4.6)
3. [Cognitive-Biometric Recognition from Language Usage: A Feasibility Study](#), **N. Pokhriyal**, I. Nwogu, V. Govindaraju, IEEE Transactions in Information Forensics, 2016. (Impact factor: 6.2)
2. [Analysis of nucleosome positioning landscapes enables gene discovery in the human malaria parasite Plasmodium falciparum](#), X. M. Lu, E. M. Bunnik, **N. Pokhriyal**, S. Nasser, S. Lonardi, K. Le Roch, BMC Genomics, 2015. (Impact factor: 3.5)
1. Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning, **N. Pokhriyal**, Masters thesis, University at California, Riverside, 2009.

Peer-reviewed Academic Conferences and Workshop Proceedings

11. AI-assisted diplomatic crisis management, **N. Pokhriyal**, Till Koebe, *forthcoming* in AI and Diplomacy workshop at AAAI Conference on Artificial Intelligence, Washington DC, 2023.
10. Social media data reveals signal for public consumer perceptions, **N. Pokhriyal**, A. Dara, B. Valentino, and S. Vosoughi, ACM International Conference on AI in Finance 2020.
9. Assessing countrywide socio-economic deprivations using auxiliary data sets, **N. Pokhriyal** and S. Vosoughi, AI for Africa for Sustainable Economic Development Workshop, ACM International Conference on AI in Finance 2020.
8. Multi-view learning from disparate sources for Poverty Mapping, **N. Pokhriyal**, AAAI Conference on Artificial Intelligence, 2019.
7. A Computational Approach to Poverty Mapping, **N. Pokhriyal**, V. Govindaraju, International Conference on Computational Sustainability, Cornell, 2016.
6. Virtual Network and Poverty Analysis in Senegal, **N. Pokhriyal**, W. Dong, V. Govindaraju, International Conference on the Analysis of Mobile Phone Datasets, MIT, 2015
5. A Large-scale Study of Language Usage as a Cognitive Biometric Trait *Invited*, **N. Pokhriyal**, I. Nwogu, V. Govindaraju, Elsevier Handbook on Big Data Analytics, 2015 .
4. Use of Language as a Cognitive Biometric Trait, **N. Pokhriyal**, I. Nwogu, V. Govindaraju, IEEE International Joint Conference on Biometrics, 2014.
3. Novel Gene Discovery in the Human Malaria Parasite using Nucleosome Positioning Data, **N. Pokhriyal**, N. Ponts, E. Harris, K. Le Roch & S. Lonardi, Intl Conf. on Computational Systems Bioinformatics, 2010.
2. Anomaly Detection for High Fidelity Core Simulators, **N. Pokhriyal**, U. Mertyurek, A. Godfrey, J. J. Billings, In Proc. of the American Nuclear Society Annual Meeting, 2013.
1. Knowledge Discovery from Nuclear Reactor Simulation Data, **Neeti Pokhriyal**, Ugur Mertyurek, Andrew Godfrey, Jay Jay Billings, Workshop on Analytics for Cyber-Physical Systems, SIAM International Data Mining Conference, 2013.

Journal articles under review

2. Quantifying participation biases on social media, **N. Pokhriyal**, B. Valentino, S. Vosoughi, 2022.
1. Fairness in learning human development indicators from mobile and satellite imagery, **N. Pokhriyal**, 2023, *In preparation*,

Selected Talks and Presentations

12. Understanding existential societal problems using a computational lens, 2023 AAAS Annual Meeting, *to be held March 2-5, 2023* in Washington, DC
11. Novel data and methods for predicting and mapping multi-dimensional poverty index, **Invited talk** at the [Oxford Poverty and Human Development Seminar Series](#), Human Development Report Office at the United Nations Development Program and the Institute of International Economic Policy at George Washington University, Nov 2021.
10. Estimating poverty, inequality and social deprivations in Haiti via machine learning techniques, National Statistics Office of Haiti, Port-au-Prince and Inter-American Development Bank, Washington DC, 2020.
9. Social media data reveals signal for public consumer perceptions, ACM International Conference on AI in Finance (ICAIF '20), 2020.
8. Assessing countrywide socio-economic deprivations using auxiliary data sets, AI for Africa for Sustainable Economic Development Workshop, ACM International Conference on AI in Finance 2020.
7. Multiple talks on Combining disparate data sources for improved poverty prediction and mapping at National Statistics Office of Senegal, United Nations Development Program (UNDP), UNICEF, Sonatel Telecom, Dakar, Senegal, 2019.
6. Multi-view learning from disparate sources for Poverty Mapping, AAAI Doctoral Consortium, 2019.
5. A Computational Approach to Poverty Mapping, Intl Conf on Computational Sustainability, Cornell, 2016.
4. Virtual Networks and Poverty Analysis, National Statistics Office, Sonatel, Senegal, June and November 2015.
3. Virtual Networks and Poverty Analysis in Senegal, NetMob, MIT, April 2015.
2. Computational Framework for Novel Gene Discovery via Machine Learning, Oak Ridge National Laboratory, Computer Science Research Seminar, February 2012. (Invited)
1. Knowledge Discovery from Nuclear Reactor Simulation Data, International Workshop on Analytics for Cyber-Physical Systems, SIAM International Data Mining Conference, 2013.

Collaborative grant writing experience

4. Facebook Research's proposal for statistics for improving insights, models, and decisions (2021) (with Prof. Soroush Vosoughi, Dartmouth) (**Finalist**).
3. Assisted in a proposal for computational models of narrative understanding (with Prof. Soroush Vosoughi, Dartmouth).
2. Neukom Institute for Computational Science, Dartmouth, compX grants with Prof. Soroush Vosoughi, Computer Science and Prof. Benjamin Valentino, Government Department on risk assessment of violence and mass atrocities for countries across the globe (2020).
1. NSF Center for Identification Technology Research proposal on biometric identification on social media and mobile networks (2016) (**Finalist** with collaborators from Clarkson University).

Recent leadership and initiative skills

1. Irving Institute seed grant program, Dartmouth College (2020) (**Awarded** as Principal Investigator) with academic-industry collaboration - I conceived the idea, managed, lead, and successfully completed the work.
2. Mentoring middle school Science Olympiad team at Fairfax County Public schools, VA (2022-2023).
3. Meeting with Quisqueya University, Haiti, and Inter-American Development Bank in Feb 2020 for a participatory exercise to build technical capacity for mapping poverty and inequality using the environment and mobile phone data.
4. Workshop on using mobile data for poverty projections at National Statistics Office, Senegal, 2019.
5. Invited to blog on poverty mapping at **the Brookings Institution** at <https://www.brookings.edu/blog/africa-in-focus/2015/06/02/big-data-for-improved-diagnosis-of-poverty-a-case-study-of-senegal/>.
6. Did a TV Interview for encouraging women to join STEM fields in Buffalo, NY in Nov 2016.
7. Participated in panel and biometrics STEM outreach event at Niagara Falls High School, NY in 2016.
8. Protégé in the Women in Computing Mentorship program, Oak Ridge National Laboratory, TN in 2013.

Mentoring

Middle school science olympiad team (2022-23 at Longfellow middle school, VA) Kshitij Tayal (for a year as visiting Master's student at UB in 2015, now a Ph.D. student at the University of Minnesota); Saumya Tripathi (for a summer as a visiting undergraduate student, UB, 2016); several MS and Ph.D. students in CS Dept, UB (for semester-long engagements).

Reviewer

Journals: Proceedings of National Academy of Sciences (PNAS), Nature Human Behavior, Nature Humanities and Social Sciences Communications, Sociological Methods and Research (SMR), SAGE Journals, Information Technology for Development (Taylor & Francis).

Conferences: International Conference on Biometrics (ICB), Biometrics: Theory, Applications, and Systems (BTAS).

Teaching

Lectures for graduate machine learning seminar, 2014.

Intermediate Data Structures and Algorithms, Fall 2009.

Professional Membership

ACM USTPC (US Technology Policy Committee)

ACM (Association for Computing Machinery)

AAAS (American Association for the Advancement of Science)