Neeti Pokhriyal, PhD
Visiting Scholar,
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Professional Experience

Dartmouth College, NH
Visiting Scholar, Department of Computer Science — Oct 2021 - present
Postdoc, Department of Computer Science — Oct 2019 - Sept 2021
jointly with Prof. Soroush Vosoughi (in Computer Science) and
Prof. Benjamin Valentino (in Government)

Irving Institute for Energy and Society, Dartmouth College — July 2020 - Sept 2021
Associate Affiliate

Inter-American Development Bank, DC — Jan 2019 - Dec 2019
Consultant
To build poverty maps using satellite and mobile phone data via machine learning for Haiti

University at Buffalo, The State University of New York, NY — Jan 2014 - Sept 2019
Graduate Research Assistant, Department of Computer Science & Engineering

Oak Ridge National Laboratory, Oak Ridge, TN — July 2012 - April 2013
Researcher, Computer Science and Mathematics Division

University of California, Riverside, CA — Sept. 2008 - Dec. 2009
Graduate Research and Teaching Assistant,
Department of Computer Science

Tata Consultancy Services, Mumbai, India — Sept. 2005 - Oct.2007
Assistant Systems Engineer, Nortel Technology Laboratory.

Education

PhD, Computer Science & Engineering — Aug 2013 - Sept 2019
University at Buffalo, The State University of New York
Dissertation Title: Learning from Disparate Data: Applications in Biometrics & Sustainability
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 poverty mapping.

Masters, Computer Science — April 2008 - Dec. 2009
University of California, Riverside
Thesis Title: Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning
The thesis proposed a computational framework to discover novel genes in the human malaria parasite genome using nucleosome positioning data.

Bachelors in Technology, *with Honors* — July 2001 – May 2005
Aligarh Muslim University, India

Funding

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 computational models to reliably now-cast energy access for electrification and clean cooking fuel at policy-planning microregions in a country, to assist in designing targeted interventions.

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 using mobile phone data.

3. **Multi-dimensional poverty mapping from mobile phone data on the OPAL platform**
   Funded by: Overseas Development Institute (ODI), UK
   As **Consultant** for **USD 15,000 (100% share)** from Feb 2019 - August 2019.
   Goal: Building algorithm that uses mobile phone data in a privacy preserving manner to map poverty.

Awards

1. **Chih Foundation Research and Publication Award, University at Buffalo, NY**, May 2019.
   This is a single award of USD 2,500 given each year for doctoral research related to innovation for the betterment of society at University at Buffalo, State University of New York.
2. **Doctoral Consortium Scholarship** for AAAI Conference on Artificial Intelligence, Jan 2019.
3. **Winner - National Statistics Prize & USD 2,000 prize**, Data for Development (D4D) Challenge
   International Conference on the Analysis of Mobile Phone Datasets, MIT, 2015.
4. **Finalist**, 3 Minute Thesis (3MT), University at Buffalo, 2019.
5. **Travel Support** to attend International Conference on Computational Sustainability, Cornell 2016.
6. **Dean's Distinguished Fellowship Award** at University of California, Riverside, 2008.
7. **Certificate of Merit** in Mathematics for being top 0.01 of the 500,000 students in Secondary Examination, 1998.

Peer-Reviewed Academic Journals

1. 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.
2. 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)
3. 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.
4. Learning from disparate data: Applications in Biometrics and Sustainability, **N. Pokhriyal**, PhD thesis, University at Buffalo, State University of New York, 2019.
5. Learning Discriminative Factorized Subspaces with application to Touchscreen Biometrics, **N. Pokhriyal**, V. Govindaraju, IEEE Access, 2020. (Impact factor: 4.6)
6. 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)
7. Analysis of nucleosome positioning landscapes enables gene discovery in the human malaria parasite Plasmodium falciparum, X. M. Lu, E. M. Bunnik, **N. Pokhriyal**, S. Nasseri, S. Lonardi, K. Le Roch, BMC Genomics, 2015. (Impact factor: 3.5)
8. Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning, **N. Pokhriyal**, Masters thesis, University at California, Riverside, 2009.

Peer-reviewed Conference Proceedings

1. 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.
2. 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.
3. Multi-view learning from disparate sources for Poverty Mapping, **N. Pokhriyal**, AAAI Conference on Artificial Intelligence Doctoral Consortium, 2019
4. A Computational Approach to Poverty Mapping, **N. Pokhriyal**, V. Govindaraju, International Conference on Computational Sustainability, Cornell, 2016.

5. Virtual Network and Poverty Analysis in Senegal, **N. Pokhriyal**, W. Dong, V. Govindaraju, International Conference on the Analysis of Mobile Phone Datasets, MIT, 2015
6. 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 .
7. Use of Language as a Cognitive Biometric Trait, **N. Pokhriyal**, I. Nwogu, V. Govindaraju, IEEE International Joint Conference on Biometrics, 2014.
8. 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.
9. 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.
10. 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.

In Review

1. Nowcasting household energy access for timely and accurate monitoring of Sustainable Development Goals, **N. Pokhriyal**, Emmanuel Letouzé, Soroush Vosoughi, In review, 2021.
2. A probabilistic modeling framework to quantify demographic biases in social media, **N. Pokhriyal**, B. Valentino, S. Vosoughi, In review, 2021.

Selected Talks

1. Novel data and methods for predicting and mapping multi-dimensional poverty index,
Oxford Poverty and Human Development Initiative (IIEP-HDRO-OPHI) Seminar Series, Nov 2021.
2. 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.
3. Combining disparate data sources for improved poverty prediction and mapping, National Statistics Office of Senegal, United Nations Development Program (UNDP), UNICEF, Sonatel Telecom, Dakar, Senegal, 2019.
4. Social media data reveals signal for public consumer perceptions, ACM International Conference on AI in Finance (ICAIF '20), 2020.
5. 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.
6. Multi-view learning from disparate sources for Poverty Mapping, AAAI Doctoral Consortium, 2019.
7. A Computational Approach to Poverty Mapping, Intl Conf on Computational Sustainability, Cornell, 2016.
8. Virtual Networks and Poverty Analysis, National Statistics Office, Sonatel, Senegal, June and November 2015.
9. Virtual Networks and Poverty Analysis in Senegal, NetMob, MIT, April 2015.
10. Computational Framework for Novel Gene Discovery via Machine Learning, Oak Ridge National Laboratory, Computer Science Research Seminar, February 2012. (Invited)
11. Knowledge Discovery from Nuclear Reactor Simulation Data, International Workshop on Analytics for Cyber-Physical Systems, SIAM International Data Mining Conference, 2013.

Broader communications to non-scientific audience

1. Blog on poverty mapping for **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/`.
2. 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 environment and mobile phone data.
3. Participated in workshop on using mobile data for poverty projections at National Statistics Office, Senegal, 2019.
4. Discussed my research on novel methods for poverty mapping with journalists (Thompson Reuters Foundation, Scidev).
5. Did a TV Interview for encouraging women to join STEM fields in Buffalo, NY in Nov 2016.

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. Participated in panel and biometrics STEM outreach event at Niagara Falls High School, NY in 2016.
3. Protégé in the Women in Computing Mentorship program, Oak Ridge National Laboratory, TN in 2013.
4. Member of the jobs and placement committee (Undergraduate).

Collaborative grant writing experience

1. Facebook Research's proposal for statistics for improving insights, models, and decisions (2021) (with Prof. Soroush Vosoughi, Dartmouth) (**Finalist**).
2. Assisted in proposal for computational models of narratives for the Defense Advanced Research Projects Agency (with Prof. Soroush Vosoughi, Dartmouth) (2021).
3. 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).
4. NSF Center for Identification Technology Research proposal on biometric identification on social media and mobile networks (2016) (**Finalist** with collaborators from Clarkson University).

- **Mentoring**: Kshitij Tayal (as visiting Masters student, UB, now Ph.D. student at University of Minnesota); Saumya Tripathi (as a visiting undergraduate student, UB); several MS and Ph.D students in CS Dept, UB.
- **Reviewer**: Proceedings of National Academy of Science (PNAS), Sociological Methods and Research (SMR), SAGE Journals, Information Technology for Development (Taylor & Francis), 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 (undergraduate).