Neeti Pokhriyal, PhD
Postdoctoral researcher,
Department of Computer Science, Dartmouth College, NH
email: neeti.pokhriyal@dartmouth.edu
web: https://neetip.github.io/

Research Interests

Machine learning, data mining, algorithm design. I am interested in modeling scenarios characterized by noisy, uncertain and high-dimensional data coming from multiple sources, sensors or modalities. The aim of my research is to jointly learn and reason under uncertainty from heterogeneous data for tackling problems of societal importance.

Professional Experience

Dartmouth College, NH — Oct 2019 - now
Post Doctoral Researcher, Department of Computer Science

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

Inter-American Development Bank, DC — Jan 2019 - Dec 2019
Consultant

University at Buffalo, State University of New York, NY — Jan 2014 - August 2019
Graduate Research Assistant, Computer Science and Engineering

Oak Ridge National Laboratory, Oak Ridge, TN — July 2012 - April 2013
Postmaster's Researcher, Computer Science and Mathematics Divison

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

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

Education

University at Buffalo, The State University of New York — August 2013 - August 2019
PhD, Computer Science and Engineering
Dissertation Title: **Learning from Disparate Data: Applications in Biometrics and Sustainability**

University of California, Riverside — April 2008 - Dec. 2009
Masters, Computer Science
Thesis Title: **Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning**

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

Funding

1. **Mapping Country-wide Energy Access for the Majority World**
   Awarded by: Irving Institute of Energy and Society, Dartmouth College
   Role: **Principal Investigator**
   Amount: **USD 31,000 (100% share)**. Timeline: July 2020 - Sept 2021.
   Goal:To build novel computational models that combine non-traditional data sources (satellite imagery, pollution data etc.) with traditional data (census and surveys) to understand country-wide energy accessibility across the population. This work facilitates research in designing sustainable energy interventions and explore newer markets for cleaner energy technologies.

2. **Financial Services for the Poor** (OPP1114791)
   Funded by: Bill and Melinda Gates Foundation
   Role: **Project Lead**, University at Buffalo, to work on poverty mapping using mobile data in Senegal
   Amount: **USD 20,000 (100% share)**. Timeline: June 2015 - Dec 2016.
   Goal: Building algorithms to map poverty using novel data (mobile phone data)

3. **Multi-dimensional poverty mapping from mobile phone data on the OPAL platform**
   Funded by: Overseas Development Institute (ODI), UK
   Role: **Consultant**
   Amount: **USD 15,000 (100% share)**. Timeline: Feb - 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** fund for AAAI Conference on Artificial Intelligence (AAAI-19), 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.

Selected Publications

Journals

5. **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: 9.4)

4. **Estimating and Forecasting Income Poverty and Inequality in Haiti Using Satellite Imagery and Mobile Phone Data**,
   N. Pokhriyal, Omar Zambrano, Jennifer Linares, Hernández, Hugo, *Working Paper*, Inter-American Development Bank, 2020.

3. **Learning Discriminative Factorized Subspaces with application to Touchscreen Biometrics**,
N. Pokhriyal, V. Govindaraju, IEEE Access, 2020. (Impact factor: 4.6)

2. **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)

1. **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)

Ph.D and Masters Thesis

2. **Learning from disparate data: Applications in Biometrics and Sustainability**,
N. Pokhriyal, PhD thesis, University at Buffalo, State University of New York, 2019.

1. **Nucleosome Landscape Analysis for Novel Gene Discovery Via Machine Learning**,
N. Pokhriyal, Masters thesis, University at California, Riverside, 2009.

Peer-reviewed Conference Proceedings

8. **Social media data reveals signal for public consumer perceptions**,
N. Pokhriyal, Abenezer Dara, Benjamin Valentino, and Soroush Vosoughi, ACM International Conference on AI in Finance (ICAIF '20), 2020

7. **Multi-view learning from disparate sources for Poverty Mapping**,
N. Pokhriyal, AAAI Conference on Artificial Intelligence Doctoral Consortium, 2019

6. **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

4. **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 .

3. **Use of Language as a Cognitive Biometric Trait**,
N. Pokhriyal, I. Nwogu, V. Govindaraju, IEEE International Joint Conference on Biometrics, 2014.

2. **Novel Gene Discovery in the Human Malaria Parasite using Nucleosome Positioning Data**,
N. Pokhriyal, N. Ponts, E. Harris, K. Le Roch and S. Lonardi, International Conference on Computational Systems Bioinformatics, 2010.

1. **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.

In Review and under Preparation

3. **An interpretable model for real-time tracking of economic indicators**,
N. Pokhriyal, Benjamin Valentino, Soroush Vosoughi, *Revision Requested*, ACM Transactions on Data Science, 2021.

2. **Quantifying and mitigating the demographic biases in social media using survey data**, **N. Pokhriyal**, Benjamin Valentino, Soroush Vosoughi.

1. **Computational model for mapping country-wide energy access for the majority world**, **N. Pokhriyal**, Emmanuel Letouzé, Soroush Vosoughi.

Lightly Reviewed Workshop Papers

3. **Assessing countrywide socio-economic deprivations using auxiliary data sets**, **Neeti Pokhriyal and Soroush Vosoughi**, AI for Africa for Sustainable Economic Development Workshop, ACM International Conference on AI in Finance (ICAIF '20).

2. **Knowledge Discovery from Nuclear Reactor Simulation Data**, **Neeti Pokhriyal**, Ugur Mertyurek, Andrew Godfrey, Jay Jay Billings, In Proc. of the 2nd International Workshop on Analytics for Cyber-Physical Systems (ACS-2013) in conjunction with SIAM International Data Mining Conference'13.

1. **Anomaly Detection for High Fidelity Core Simulators**, **Neeti Pokhriyal**, Ugur Mertyurek, Andrew Godfrey, Jay Jay Billings, In Proc. of the American Nuclear Society Annual Meeting, 2013.

Selected Recent Talks

8. **Social media data reveals signal for public consumer perceptions**, ACM International Conference on AI in Finance (ICAIF '20), 2020

7. **Assessing countrywide socio-economic deprivations using auxiliary data sets**, AI for Africa for Sustainable Economic Development Workshop, ACM International Conference on AI in Finance (ICAIF '20).

6. **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

5. **Combining disparate data sources for improved poverty prediction and mapping**, National Statistics Office of Senegal, United Nations Development Program (UNDP), UNICEF, Dakar, Senegal, 2019.

4. **Multi-view learning from disparate sources for Poverty Mapping**, AAAI Conference on Artificial Intelligence Doctoral Consortium, 2019.

3. **A Computational Approach to Poverty Mapping**, International Conference on Computational Sustainability, Cornell, 2016.

2. **Virtual Networks and Poverty Analysis - A case study**, National Statistics Office of Senegal, Dakar, June and November 2015.

1. **Virtual Networks and Poverty Analysis in Senegal**, NetMob, MIT, April 2015.

Recent Service

- **Reviewer** for Proceedings of National Academy of Science(PNAS) 2020, International conference on Biometrics (ICB), Biometrics: Theory, Applications and Systems (BTAS)

- Recent **grant writing** experience
  DARPA proposal on narratives in social media (2021) Irving Institute seed grant program, Dartmouth College (2020) (**Awarded** as PI);
  Neukom Institute for Computational Science CompX Faculty grants, Dartmouth College (2020);
  NSF Center for Identification Technology Research (CITeR) proposal (2016)(**Finalist**);

- **Broader communications**: Authored blog on poverty mapping for **the Brookings Institution** https://www.brookings.edu/blog/africa-in-focus/2015/06/02/big-data-for-improved-diagnosis-of-poverty-a-case-study-of-senegal/
- **Mentoring**: Kshitij Tayal (as visiting Masters student, now Ph.D student at University of Minnesota); Saumya Tripathi (as a visiting undergraduate student); several MS and Ph.D students.
- **Teaching**: Lectures for graduate machine learning seminar, 2014; Intermediate Data Structures and Algorithms, Fall 2009 (undergraduate)
- **Outreach**: STEM Outreach Event at Niagara Falls High School, 2016 in conjunction with NSF Center for Identification Technology Research (CITeR) regarding careers in STEM.

Citizenship United States.

References available upon request