Guruprasad Nayak **https://guruprasadnk7.github.io**

CONTACT INFORMATION
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RESEARCH INTERESTS
Machine Learning; Automated Machine Learning; Training Large Language Models; Semi-supervised Learning; Rare Class Discovery; Computational Earth Science

EDUCATION

University of Minnesota, Minneapolis, MN

Ph.D., Computer Science and Engineering, January 2020

- Specialization: Machine Learning
- Dissertation: Learning with Weak Supervision for Land Cover Mapping Problems
- Advisor: Dr. Vipin Kumar

Indian Institute of Technology Kanpur, U.P., India

B.Tech., Computer Science and Engineering, July 2013

EMPLOYMENT

Applied Scientist June 2022 to Present
Amazon Web Services (AWS)
Seattle Metropolitan Area, WA
Current Manager: Dr. Gerald Friedland
Current Project: Automating Deep (Machine) Learning on AWS Sagemaker. Building chat-powered data preparation tool on Sagemaker Canvas.

Applied Scientist Feb 2020 to May 2022
Amazon.com Services LLC,
San Francisco Bay Area, CA
Managers: Dr. Shan Kang
Projects: Forecasting inventory for Amazon Advertising

Graduate Research & Teaching Assistant Sept 2013 to Jan 2020
Department of Computer Science and Engineering,
University of Minnesota, Twin Cities
Supervisors: Dr. Vipin Kumar

Data Scientist Sept 2018 to Dec 2018
Bay Area Environmental Research Institute (BAER),
NASA Ames Research Center, Mountain View, CA
Supervisors: Dr. Ramakrishna Nemani

Software Engineer Jan 2018 to August 2018
Research and Development team,
FastBridge Learning, Minneapolis
Supervisors: Dr. Zoheb Borbora, CTO

Research Intern May 2017 to Sept 2017
Analytics Research Group,
Bell Labs, Dublin, Ireland
Supervisors: Dr. Deepak Ajwani and Dr. Alessandra Sala

Visiting Scholar May 2012 to August 2012

Department of Computer Science and Engineering,
University of Minnesota, Twin Cities
Supervisors: Dr. Vipin Kumar

Research Assistant December 2011 to March 2012
Department of Mathematics and Statistics,
Indian Institute of Technology Kanpur, India
Supervisors: Dr. Amit Mitra

Research Intern May 2011 to July 2011
Ganga River Basin Management Project (GRBMP)
Government of India
Supervisors: Dr. Krithika Venkataramani

Patents

- Classification of ultra-skewed data.
(Patent number US 10,776,713)

Refereed Journal Publications

1. **G. Nayak**, G. Friedland et.al. "Using Perceptual Compression to Reduce Machine Learning Complexity ". (in submission) IEEE Transactions on Multimedia 2024
2. **G. Nayak**, S. Dutta, D. Ajwani, P. Nicholson, and A. Sala. "Automated assessment of knowledge hierarchy evolution: comparing directed acyclic graphs." Information Retrieval Journal (2019)
3. V. Mithal*, **G. Nayak***, A. Khandelwal, V. Kumar, N. Oza, R. Nemani, "Mapping Burned Areas in Tropical Forests Using a Novel Machine Learning Framework". Remote Sensing 2018, 10, 69. **(* - equal contribution)**
4. V. Mithal, **G. Nayak**, A. Khandelwal, V. Kumar, N. Oza, R. Nemani, "RAPT: Rare class prediction in absence of true labels". IEEE Transactions on Knowledge and Data Engineering 2017, 29(11), 2484-2497.

Refereed Conference and Workshop Publications

1. **G. Nayak**, G. Friedland " Deep layers beware: Unraveling the surprising benefits of JPEG compression for image classification pre-processing ". in Proceedings of the 25th IEEE International Symposium on Multimedia 2023 (Acceptance rate - **24.69%**)
2. **G. Nayak**, R. Ghosh, X. Jia, V. Kumar "Weakly Supervised Classification using Group-level Labels". in 2nd International Workshop on Data-Efficient Machine Learning (DeMaL), Knowledge Discovery and Data Mining (KDD) Conference 2021
3. **G. Nayak**, R. Ghosh, X. Jia, V. Mithal, V. Kumar "Semi-supervised classification using attention-based regularization on coarse-resolution data". in Proceedings of the 2020 SIAM International Conference on Data Mining (SDM20) (Acceptance Rate: **19.3%**)
4. **G. Nayak**, R. Ghosh, X. Jia, V. Mithal, V. Kumar "Spatio-temporal classification at multiple resolutions using multi-view regularization" in Proceedings of the 2019 IEEE International Conference on Big Data (IEEE BigData 2019)
5. X. Jia, **G. Nayak**, A. Khandelwal, A. Karpatne, V. Kumar "Classifying Heterogeneous Sequential Data by Cyclic Domain Adaptation: An Application in Land Cover Detection" in Proceedings of the 2019 SIAM International Conference on Data Mining (SDM19) (Acceptance rate: **22.7%**)

6. X. Jia, S. Li, A. Khandelwal, **G. Nayak**, A. Karpatne, V. Kumar "Spatial Context-Aware Networks for Mining Temporal Discriminative Period in Land Cover Detection" in Proceedings of the 2019 SIAM International Conference on Data Mining (SDM19) (Acceptance rate: **22.7%**)
7. **G. Nayak**, S. Dutta, D. Ajwani, P. Nicholson, A. Sala "Automated Knowledge Hierarchy Assessment" in the Second Workshop on Knowledge Graphs and Semantics for Text Retrieval, Analysis, and Understanding (KG4IR). Co-located with SIGIR 2018
8. **G. Nayak**, V. Mithal, X. Jia, V. Kumar "Classifying multivariate time series by learning sequence-level discriminative patterns" in proceedings of the 2018 SIAM International Conference on Data Mining (SDM18) (Acceptance rate: **23.2%**)
9. X.Jia, A. Khandelwal, **G. Nayak**, J. Gerber, K. Carlson, P. West, V. Kumar "Incremental dual-memory lstm in land cover prediction." in proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2017) (Acceptance rate: **17.5%**)
10. X.Jia, A. Khandelwal, **G. Nayak**, J. Gerber, K. Carlson, P. West, V. Kumar "Predict Land Covers with Transition Modeling and Incremental Learning" in proceedings of the 2017 SIAM International Conference on Data Mining (SDM17) (Acceptance rate: **26.0%**)
11. **G. Nayak**, V. Mithal, V. Kumar, "Multiple Instance Learning for burned area mapping using multitemporal reflectance data ", International Workshop on Climate Informatics, 2016 (selected for spotlight presentation) (CI 2016)

Manuscripts

1. **G. Nayak**, V. Mithal, X. Jia, R. Ghosh, V. Kumar, R. Nemani "WORD: Weakly Supervised Regression with Ordinal Labels: with a novel extension for rare class optimization".

Software

- A web viewer was developed to make the global maps of burned forests we developed publicly available at https://z.umn.edu/fireviewer

Awards

Travel Awards

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining — Aug 2019
- SIAM International Conference on Data Mining, Calgary, Canada — May 2019
- Climate Informatics, Boulder, CO — Sept 2016

Student Awards — Indian Institute of Technology Kanpur

- Merit-cum-Means Scholarship — 2009-13
  - The Merit-cum-Means (MCM) Scholarship at IIT Kanpur is awarded to meritorious students from weaker economic backgrounds.

Refereed Poster Presentations & Abstracts

1. **G. Nayak**, V. Mithal, X. Jia, V. Kumar, R. Nemani "Learning predictive models with weak supervision". Doctoral forum at the 2019 SIAM International Conference on Data Mining. Society for Industrial and Applied Mathematics, 2019 (SDM19)
2. V. Mithal, **G. Nayak**, A. Khandelwal, V. Kumar, N. Oza and R. Nemani, 2015, December. Global Monitoring of Tropical Forest Fires Using A New Predictive Modeling Approach for Rare Classes. In AGU Fall Meeting Abstracts.
3. V. Mithal, A. Khandelwal, **G. Nayak**, V. Kumar, R. Nemani and N. Oza, 2014, December. A Spatio-temporal Data Mining Approach to Global scale Burned Area Monitoring. In AGU Fall Meeting Abstracts.

4. N. Oza, V. Kumar, R. Nemani, S. Boriah, K. Das, A. Khandelwal, B. Matthews, A. Michaelis, V. Mithal, **G. Nayak** and P. Votava, 2014, December. Integrating Parallel and Distributed Data Mining Algorithms into the NASA Earth Exchange (NEX). In AGU Fall Meeting Abstracts.

Professional service

Reviewer for the following journal, conference and workshop proceedings

Remote Sensing, Remote Sensing in Ecology and Conservation, Knowledge and Information Systems, SDM 2020, SDM 2021, IEEE BigData 2019, IEEE BigData 2020, ACM PAKDD 2020, ACM PAKDD 2021

Educational Activities

Teaching Assistant Fall 2014, Spring 2016, Spring 2017

For the graduate-level 'Introduction to Data Mining' course

Guest Lecturer

For the graduate-level 'Spatio-temporal Data Mining' course Fall 2016

For the graduate-level 'AI for Earth' course Fall 2019

Student Mentor

Mentored the following students:

- Rahul Ghosh Jan 2019 to Dec 2019
  (PhD student in the Kumar research group at University of Minnesota)
- Aravinthan Balasubramanium Summer 2015
  (sophomore from University of Minnesota)

References

Some recommendations are available on my LinkedIn profile (click here: LinkedIn). Others can be provided upon request.