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

CONTACT INFORMATION
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St Paul, MN 55104
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RESEARCH INTERESTS
Machine Learning; Weakly Supervised Learning; Rare Class Discovery; Knowledge Graphs; Deep Learning; Natural Language Processing; Computational Earth Science

EDUCATION

**University of Minnesota**, Minneapolis, MN

Ph.D., Computer Science and Engineering, *Expected:* Fall 2019

- Thesis Topic: *Learning with weak supervision*
- Advisor: Dr. Vipin Kumar

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

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

EMPLOYMENT

**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

**Research Assistant** Sept 2013 to Dec 2017
Department of Computer Science and Engineering,
University of Minnesota, Twin Cities
Supervisors: Dr. Vipin Kumar

**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.
(Application number US 15/137,603)

## Journal Publications

1. **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)
2. 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)**
3. 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**, R. Ghosh, V. Mithal, X. Jia, V. Kumar "Spatio-temporal classification at multiple resolutions using multi-view regularization" International Workshop on Climate Informatics, 2019 (CI 2019) - *to appear*
2. 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)
3. 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)
4. **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
5. **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)
6. 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)
7. 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)
8. **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**, R. Ghosh, X. Jia, V. Kumar "Weakly Supervised Classification using Group-level Labels". Under review.
2. **G. Nayak**, R. Ghosh, X. Jia, V. Kumar "Semi-supervised classification using attention-based regularization on coarse-resolution data". Under submission to 2020 SIAM International Conference on Data Mining (SDM20)
3. **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". Under submission to 2020 SIAM International Conference on Data Mining (SDM20)

## 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.

## Posters

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, KDD, ICDM, SDM, AAAI, IJCAI, Climate Informatics.

## 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 — Spring 2019-present
  (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.