Aastha Nigam

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EXECUTIVE SUMMARY

- 5th Year Computer Science and Engineering Ph.D. student with extensive experience in programming (Python, C/C++, Java, R).
- Analyzed large data sets (healthcare, social media, peace processes) by combining methods from data mining, machine learning, natural language processing, computational social science and deep learning.
- Developed context driven computational models for personalized user experience; utilized large datasets for building better user profiles and inferring their preferences.

EDUCATION

Ph.D. Candidate in Computer Science and Engineering   Anticipated Summer 2018
University of Notre Dame
Advisor: Prof. Nitesh V. Chawla
Thesis Title: Beyond Who and What: Data Driven Approaches for User Characterization

M.S. in Computer Science and Engineering   2013-2017
University of Notre Dame
Advisor: Prof. Nitesh V. Chawla

B.S. (with Hons.) in Computer Science and Engineering   2008–2012
IIIT-Delhi, India

RESEARCH EXPERIENCE

Dept. of Computer Science and Engineering | University of Notre Dame   **Notre Dame, IN**
Research Assistant; Advisor: Prof. Nitesh V. Chawla   July 2014–Present

- Research focuses on building context driven machine learning models to solve real world problems with applications to areas as diverse as social media, online healthcare and world peace accords. Models aim at mining interesting patterns from structured and unstructured data utilizing key concepts from machine learning, deep learning, text analytics and data mining.
- Developed framework to harvest signals from social media to monitor the success and implementation based on public opinion and sentiment for peace processes.
- Developed personalized user profiles for online health consumers (~ 2 million users), performed user segmentation using demographics and analyzed factors affecting their preferences for a large-scale national online health content provider.
- Implemented a successful framework to model content gap between a media company and their Twitter users to increase user engagement. The partnering company used the framework to understand follower preferences and improve content quality posted on Twitter.

Army Research Laboratory   **Adelphi, MD**
Researcher; Advisor: Dr. Michelle Vani   July 2017

- Research focuses on building context driven machine learning models to understand peace processes by harvesting social signals from social networks.
- Models aim at continuous monitoring of peace process to infer the change of public opinion and sentiment over time.

Dept. of Computer Science and Engineering | University of Notre Dame   **Notre Dame, IN**
Research Assistant; Advisor: Prof. Laurel Riek   January 2014–July 2014
- Research focused on classifying several aspects of situational context from noisy data to improve navigation of robots in human social environment. One of the first research to predict situational context for robots, which resulted in a publication.
- Employed a context based perception approach leveraging audio and visual signals for learning various situational contexts from large-scale real world multimodal data using machine-learning models.

Image Analysis and Biometrics Lab | IIIT-Delhi   **New Delhi, India**
Research Assistant; Advisor: Prof. Mayank Vatsa and Prof. Richa Singh   August 2011–July 2012
- Proposed a framework termed as "Anavrta" to establish the feasibility of face verification under disguise variations using multispectral (visible and thermal) face images. The framework was based on low-level feature extraction and biometric patch classification. Accepted at International Conference on Biometrics.
- Due to the lack of any comprehensive database for this research, to validate the framework a database comprising of multispectral disguised face images of 75 participants was collected. At present, this is the largest database of disguised face images.

PreCog Research Group| IIIT-Delhi   **New Delhi, India**
Research Assistant; Advisor: Prof. N. Balakrishnan and Prof. Ponnurangam Kumaraguru   May 2010–January 2011
- Formed an actor-to-actor terrorist network using open source data such as newspaper articles and analyzed it using many social network analysis metrics. Aim was to study the evolution of terrorist networks over time.
- Various natural language processing techniques were used to improve the automatic entity extraction. Part of this research was conducted at Supercomputer Education and Research Center (SERC) at Indian Institute of Science in Bengaluru under the guidance of Prof. N. Balakrishnan.

Image Analysis and Biometrics Lab | IIIT-Delhi   **New Delhi, India**
Research Assistant; Advisor: Prof. Mayank Vatsa and Prof. Richa Singh   May 2009–January 2010
- Studied the ability of computers versus humans to identify different fingerprints to prove the effectiveness of computers by leveraging various detailed features not visible to the naked eye.
- To further improve machine performance to identify a person, analyzed the effectiveness of fusing of two biometric modalities, face and finger, at match score level for biometric verification systems.

PROFESSIONAL EXPERIENCE

IBM Research   **Dublin, Ireland**
Data Science Intern   June 2015–August 2015
- Implemented various optimization algorithms such as AdaGrad as an extension to the Machine Learning library by Apache Spark for large-scale data cluster computing. The company currently uses the implementation. The work resulted in a publication.
- Worked on user cold start problems in recommendation systems by leveraging simhash of user attributes.
- Participated in ICDM 2015 Kaggle Data Challenge to connect user actions across different devices using context-driven models.

Innovation Labs, Tata Consultancy Services R&D   **Noida, India**
Researcher   July 2012–July 2013
- Developed a web based collaborative workbench for real time analysis and visualization, using tools such as d3 library and JavaScript, for varied datasets including car sensor data and time-series. Successfully used for evaluating research outputs.

ABB Research   **Bengaluru, India**
Research Intern   May 2011–July 2011

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- Developed an android-based mobile application that enabled a user to build workflows and define a process using symbols customized for each domain.

TEACHING EXPERIENCE

University of Notre Dame   **Notre Dame, IN**
Graduate Teaching Assistant   August 2013–May 2014
- Worked as a Teaching Assistant for Design and Analysis of Algorithms in Fall 2013 and Basic Unix for Engineers in Spring 2014
- Graded and provided feedback on quizzes and assignments; Managed class materials and grades.

The Stanley Clark School   **South Bend, IN**
Volunteer Teaching   August 2016
- Instructed a weeklong course introducing youth to basic programming concepts.

IIIT-Delhi   **New Delhi, India**
Teaching Assistant   January 2011–May 2011
- Worked as a Teaching Assistant for Theory of Computation (CSE322).
- Conducted tutorials and office hours; Graded examinations and home assignments.

TECHNICAL QUALIFICATIONS

Programming Language Proficiency: Python, Java, C, C++, C#, JavaScript
Data analysis and visualization tools: R, Spark, Hadoop, MATLAB
Database Experience: MySQL, PHP
Typesetting Tools: Latex, Microsoft Office
Operating Systems: Microsoft Windows, Ubuntu Linux, Mac OSX

REFEREED PUBLICATIONS

11. A. Nigam, K. Shin, B. Hooi, N. V. Chawla, and C. Faloutsos, *Modeling Trends for Polarized Populations* (In preparation)
10. A. Nigam, M. Vanni, and N. V. Chawla, *Studying the Evolution of Opinions on Social Media* (In preparation)
9. H. K. Dambanemuya, A. Nigam, and N. V. Chawla, *Comparison between Social and News Media for Peace Processes* (In preparation)
8. A. Nigam, R. A. Johnson, D. Wang, and N.V. Chawla, *Characterizing Online Health and Wellness Information Consumption: A Study*, Information Fusion Journal, 2018 (under review)
7. A. Nigam, *Beyond Who and What: Data Driven Approaches for User Characterization*, WSDM 2018: 11th ACM International Conference on Web Search & Data Mining, 2018
6. A. Nigam, H. K. Dambanemuya, M. Joshi, and N. V. Chawla, *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring*, Big Data Journal, 2017
5. A. Nigam and N. V. Chawla, *A Content-Driven Framework for Online User Understanding*, Book chapter in Social Media Analytics: Advances and Applications, 2017 (accepted, to appear)
4. A. Nigam, S. Aguiñaga, and N. V. Chawla, *Connecting the Dots to Infer Followers' Topical Interest on Twitter*, IEEE International Conference on Behavioral, Economic, and Socio-Cultural Computing, 2016.
3. A. Nigam and N. V. Chawla, *Link Prediction in a Semi-Bipartite Network for Recommendation*, 8th Asian Conference on Intelligent Information and Database Systems, 2016.
2. A. Nigam, and L.D. Riek, *Context-Based Perception for Social Mobile Robot Navigation*, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2015.
1. T. I. Dhamecha, A. Nigam, R. Singh, and M. Vatsa, *Disguise Detection and Face Recognition using Visible and Thermal Images*, 6th IAPR International Conference on Biometrics, 2013.

POSTER PRESENTATIONS

5. A. Nigam, H. K. Dambanemuya, M. Joshi, and N. V. Chawla, *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring*, Women in Statistics and Data Science, October 2017, La Jolla, California

4. A. Nigam, H. K. Dambanemuya, M. Joshi, and N. V. Chawla, *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring*, ACM Student Research Competition, October 2017, Orlando, Florida **(Won 2nd Prize)**

3. A.T. Hadgu, A. Nigam, and Diaz-Aviles, E., *Large-Scale Learning with AdaGrad on Spark*, IEEE International Conference on Big Data (IEEE Big Data), October 2015, Santa Clara, California

2. A. Nigam, S. Aguiñaga, and N. V. Chawla, *Topic Models to Increase User Engagement on Twitter*, Grace Hopper Conference (GHC), October 2015, Houston, Texas

1. A. Nigam, S. Aguiñaga, and N. V. Chawla, *Topic Models to Increase User Engagement on Twitter*, Computing Research Association - Women (CRA-W) Workshop, April 2015, San Francisco, California

PRESENTATIONS

8. *Beyond Who and What: Data Driven Approaches for User Characterization,* 3M, November 2017, St. Paul, Minnesota

7. *Understanding peace processes through social media*, Women in Statistics and Data Science, October 2017, La Jolla, California

6. *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring*, Grace Hopper Celebration, October 2017, Orlando, Florida

5. *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring,* Army Research Laboratory, July 2017, Adelphi, Maryland

4. *Beyond Who and What: Data Driven Approaches for User Characterization,* University of Notre Dame, April 2017, Notre Dame, Indiana

3. *Harvesting Social Signals to Inform Peace Processes Implementation and Monitoring*, Army Research Laboratory, April 2017, Aberdeen, Maryland

2. *Connecting the Dots to Infer Followers' Topical Interest on Twitter*, IEEE International Conference on Behavioral, Economic, and Socio-Cultural Computing, October 2016, Durham, North Carolina

1. Sparkxcursion, IBM Research, August 2015, Dublin, Ireland

RELEVANT COURSES

Graduate Level: Machine Learning, Complexity and Algorithms, Data Mining, Stats Methods in Data Mining, Social Sensing and Cyber-Physical Systems

Undergraduate Level: Machine Learning, Information Retrieval, Pattern Recognition, Data Structures, Advanced Programming, Linear Algebra, Probability and Statistics.

AWARDS AND HONORS

Secured second position at the ACM SRC Graduate Category	2017
Scholarship to attend ACM SRC at GHC 17 Conference	2017
Scholarship to attend BPDM 2017 at KDD	2017
Outstanding Student Service Award	2017
Scholarship to attend SWE 16 Conference	2016
Scholarship to attend CRA-W Graduate Cohort	2015
Secured second position in Schurz (Data Mining) Innovation Challenge	2014
Undergraduate Honors in Computer Science	2012
Graduated at Rank 4 in undergraduate program at IIIT-Delhi	2012
Scholarship for obtaining All India Rank 6 (and Rank 1 amongst girls) in the entrance exam, IIIT-Delhi	2008

ACADEMIC SERVICE

Reviewing
- Reviewer, AMIA, 2017
- Reviewer, IEEE Transactions on Neural Networks and Learning Systems, 2017
- Reviewer, Transactions on Knowledge and Data Engineering, 2015, 2016
- Reviewer, Knowledge and Information Systems, 2015, 2016
- Reviewer, Transactions on Knowledge Discovery from Data, 2015
- Reviewer, ACM International Conference on Recommendation Systems (RecSys), 2015
- Reviewer, Big Data, 2015

Mentoring
- Mr. Tongzhou Mu, CSE Undergraduate visiting from Zhejiang University
- Ms. Sara Cunningham, CSE Undergraduate at University of Notre Dame
- Ms. Jessica Zheng, High school senior

LEADERSHIP & INVOLVEMENT

CSE Graduate Student Board, University of Notre Dame   **Notre Dame, IN**
Graduate Mentor   August 2017–Present
- Mentor for first year graduate students in the computer science and engineering department. I am responsible for helping them through the initial years of graduate school.

Graduate Student Union, University of Notre Dame   **Notre Dame, IN**
Professional Development Co-Chair   July 2016–May 2017
- Working towards professional development of graduate students at the university by organizing workshops, seminars, symposiums and catering to their needs.

Graduate Society of Women Engineers, University of Notre Dame   **Notre Dame, IN**
Professional Development Co-Chair   July 2016–May 2017
- An association to empower graduate women engineers and caters to their professional growth and learning. As the co-chair, I am responsible for conducting workshops, research poster sessions and lunch & learns.
- Organized the Fireside chat for the Walk the walk week.

CSE Graduate Student Board, University of Notre Dame   **Notre Dame, IN**
Member   July 2016–May 2017
- Being a board member, we are responsible to establish effective communication between the department and the graduate students. The board also organizes professional and social events during the academic year.

University Committee on Women Faculty and Students, University of Notre Dame   **Notre Dame, IN**
Member   August 2016-May 2017
- Student representation to empower women in all fields at both faculty and student level.

Advisory Committee Related to Race and Ethnicity, University of Notre Dame   **Notre Dame, IN**
Appointee of the Graduate Student Union President   August 2016–May 2017
- Diversity and inclusion advisory committee to welcome students from all backgrounds irrespective of culture, ethnicity, and socio-economic status.

Graduate Student Life, University of Notre Dame   **Notre Dame, IN**
Graduate Orientation Ambassador   August 2016
- Organized the orientation and various associated social, professional and networking events to welcome new graduate students at the university.

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Association for Women in Science Regional Conference, University of Notre Dame　　　　　　**Notre Dame, IN**
External Funding Committee　　　　　　　　　　　　　　　　　　　　　　　　　　　　August 2016
- Responsible for bringing external sponsorship for the first regional women in science conference hosted by Association of Women in Science at Notre Dame (AWIS-ND).

Student Board, IIIT-Delhi　　　　　　　　　　　　　　　　　　　　　　　　　**New Delhi, India**
Student Representative　　　　　　　　　　　　　　　　　　　　　　　August 2009-May 2011
- Member of the Student Board and served as the Female Student Representative for 2 years at IIIT Delhi.

VOLUNTEER SERVICE
- Volunteer, Center for Homeless in South Bend, Indiana, 2015-Present
- Judge, Northern Indiana Regional Science & Engineering Fair, 2015
- Organized blood drive, IIIT-Delhi, 2010
- Co-Founder, *Communitas Opera*, IIIT-Delhi, 2009

REFERENCES
References available on request