Aastha Nigam

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Executive Summary

- 3rd 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, telecommunications) by combining methods from data mining, machine learning and natural language processing.
- Successfully implemented optimization algorithms as an extension to Spark Machine Learning library. Avid programmer in PySpark.
- Trained and mentored undergraduate and graduate students in programming, data analysis, and statistical methods.

Education

University of Notre Dame **Notre Dame, IN**
Ph.D. in Computer Science and Engineering, ***3.91/4*** *Anticipated 2018*
Thesis Topic: Integrating and Modeling Diverse Nuggets of Data to Model User Behavior.

IIIT-Delhi **New Delhi, India**
Bachelors of Technology (Hons.) in Computer Science and Engineering, ***9.25/10*** *May 2012*

Research Experience

Graduate Research Assistant **Notre Dame, IN**
iCeNSA, University of Notre Dame, Advisor: Dr. Nitesh Chawla *July 2014–Present*
Working on mining interesting patterns from large amounts of structured and unstructured user's on-line data to understand their behavior, using both content and context, to improve their experience and make useful recommendations.

Graduate Research Assistant **Notre Dame, IN**
Robotics, Health, and Communication (RHC) Lab, Advisor: Dr. Laurel Riek *January 2014–July 2014*
Applied machine learning algorithms to understand several aspects of situational context to enable easy navigation of robots in naturalistic environment. Accepted at International Conference on Intelligent Robots and Systems 2015.

Research Assistant **New Delhi, India**
IAB Lab, IIIT-Delhi, Advisors: Dr. Mayank Vatsa and Dr. Richa Singh *May 2012–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 2013.

Project Associate **Bengaluru, India**
Indian Institute of Science (IISc), Advisor: Dr. N. Balakrishnan *May 2010–January 2011*
Precog, IIIT-Delhi, Advisor: Dr. Ponnurangam Kumaraguru

Formed an actor-to-actor terrorist network using open source data such as newspaper articles and analysed it using many social network analysis metrics. Various natural language processing techniques were used to improve the automatic entity extraction. This project was partly funded by Department of Information Technology.

Undergraduate Research Intern **New Delhi, India**
IAB Lab, IIIT-Delhi, Advisors: Dr. Mayank Vatsa and Dr. Richa Singh *December 2009–January 2010*
Analyzed the effectiveness of fusing of two biometric modalities, face and finger, at match score level for biometric verification systems. This project was funded by UID Authority of India.

Undergraduate Research Intern **New Delhi, India**
IAB Lab, IIIT-Delhi, Advisors: Dr. Mayank Vatsa and Dr. Richa Singh *May 2009–July 2009*

Collected a large database of fingerprints and analyzed the similarity between two fingerprints. Also, compared the performance of humans distinguishing fingerprints with machines. This project was funded by UID Authority of India.

Professional Experience

Research Intern **Dublin, Ireland**
IBM Research, Advisor: Dr. Ernesto Diaz-Aviles *June 2015–August 2015*

Extended Spark Machine Learning Library by implementing optimization algorithms such as AdaGrad. This work was accepted at IEEE International Conference on Big Data 2015. Additionally, worked on connecting user actions across different devices they own using the ICDM 2015 Kaggle Challenge dataset. Currently, working on predicting the next action of a user on a mobile device using the Device Analyzer Dataset by University of Cambridge.

Researcher **Noida, India**
Innovation Labs, TATA Consulting Services R&D, Mentor: Dr. Gautam Shroff *July 2012–July 2013*

Developed a Collaborative Workbench for real time analysis and visualization using d3 library of various types of data such as car sensor data.

Undergraduate Research Intern **Bengaluru, India**
ABB Research, Advisor: Dr. Atul Kumar *May 2011–July 2011*

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

Teaching Experience

Graduate Teaching Assistant **Notre Dame, IN**
University of Notre Dame *August 2013–May 2014*

Worked as a Teaching Assistant for *Design and Analysis of Algorithms (CSE 40113)* and *Basic Unix for Engineers (CSE 20189)*. Duties included conducting tutorials and office hours and grading examinations and home assignments.

Undergraduate Teaching Assistant **New Delhi, India**
IIIT-Delhi *January 2011–May 2011*

Worked as a Teaching Assistant for *Theory of Computation (CSE322)*. Duties included conducting tutorials and office hours and grading examinations and home assignments.

Publications

Aastha Nigam and Nitesh Chawla, *Inferring User Demographics from Content Consumed*. In preparation.

Aastha Nigam, Asmelash Teka Hadgu and Ernesto Diaz-Aviles, *Identifying Individual Users Across Digital Devices*. In preparation.

Aastha Nigam, Salvador Aguiñaga and Nitesh V. Chawla, *Topic Models to Increase User Engagement on Twitter*. Submitted.

Aastha Nigam and Nitesh V. Chawla, *Link Prediction in a Semi-Bipartite Network for Recommendation*. Accepted at Asian Conference on Intelligent Information and Database Systems (ACIIDS) 2016.

Aastha Nigam and Laurel D. Riek, *Context-Based Perception for Social Mobile Robot Navigation*. Accepted at International Conference on Intelligent Robots and Systems (IROS) 2015.

Tejas I. Dhamecha, **Aastha Nigam**, Richa Singh and Mayank Vatsa, *Disguise Detection and Face Recognition using Visible and Thermal Images*. Accepted at International Conference on Biometrics (ICB) 2013.

Poster Presentations

Asmelash Teka Hadgu, **Aastha Nigam** and Ernesto Diaz-Aviles, *Large-Scale Learning with AdaGrad on Spark*. Accepted at IEEE International Conference on Big Data (IEEE Big Data) 2015, Santa Clara - CA.

Aastha Nigam, Salvador Aguiñaga and Nitesh V. Chawla, *Topic Models to Increase User Engagement on Twitter.* Presented at Grace Hopper Conference (GHC) 2015, Houston - TX

Aastha Nigam, Salvador Aguiñaga and Nitesh V. Chawla, *Topic Models to Increase User Engagement on Twitter.* Presented at Computing Research Association - Women (CRA-W) Workshop 2015, San Fransisco - CA

Selected Projects

TalkBender: Social Topic Analyzer*(2014)*
Developed a mobile application called TalkBender for a local media communication company that summarized and analyzed the topics trending amongst their Twitter followers in real time. This project secured second position in the Schurz Innovation Challenge.

Performance Evaluation of the All-Pairs Abstraction*(2013)*
Evaluated the performance of the All Pairs abstraction using an iris matching algorithm against its sequential execution in two different computing environment - the Notre Dame CRC cluster and the Condor pool.

Recognizing Altered Face In and Beyond Visible Spectrum*(2011-2012)*
Developed an algorithm for recognizing faces with altered appearances leveraging information from multispectral (visible and thermal) face images. Due to the lack of any comprehensive database for this research, a database comprising of multispectral disguised face images of 75 participants was collected. At present, this is the largest database of disguised face images.

Credibility of information on Twitter*(2011)*
Analyzed the credibility of the news reported on Twitter. Designed a web based annotation tool to obtain the ground truth regarding the presence of credible information in tweets from 14 high impact news events from around the globe. Also, performed supervised machine learning techniques to rank tweets and classify them as spam or ham.

Relevant Courses

Graduate Level: Complexity and Algorithms, Data Mining, Stats Methods in Data Mining.

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

Technical Skills

Programming Languages: Python, R, C, Java, C++, MATLAB, C#, SQL, JavaScript, PHP, HTML.

Tools + Technologies: Spark, Hadoop, Condor, Cytoscape, MySQL, Weka, ORA, Stanford NER, Google API, Twitter API, Eclipse, HTML/CSS, Visual Studio.

Honors and Awards

Scholarship to attend CRA-W Graduate Cohort in April 2015 awarded by CRA-W.

Secured second position in Schurz (Data Mining) Innovation Challenge, 2014.

Graduated at Rank 4 in under-graduate at IIIT-Delhi, 2012.

Scholarship for obtaining All India Rank 6 (and Rank 1 amongst girls) in the entrance exam, IIIT-Delhi, 2008.

Leadership and Involvement

Graduate Student Union, University of Notre Dame **Notre Dame, IN**
Professional Development Co-Chair *August 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 *August 2016–May 2017*

An association to empower graduate women engineers and cater to their professional growth and learning. As the co-chair, I am responsible for conducting workshops, research poster sessions and lunch & learns.

Graduate Student Board, University of Notre Dame **Notre Dame, IN**
Member - CSE Department *August 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.

International Student and Scholar Affairs, University of Notre Dame **Notre Dame, IN**
International Graduate Student Orientation Ambassador *August 2016*

Work towards welcoming international graduate students, help in international orientation and conduct workshops.

University Committee on Women Faculty and Students, University of Notre Dame **Notre Dame, IN**
Graduate Student Representative *August 2016–May 2017*

Student representation to empower women in all fields at both faculty and student level.

Association for Women in Science, University of Notre Dame **Notre Dame, IN**
Member on Organization Committee *May 2016–October 2016*

Responsible for bringing external sponsorship for regional women in science conference hosted by AWIS-ND.

Student Board, IIIT Delhi **New Delhi, India**
Student Representative *August 2009–May 2011*

Member of the Student Board and served as the Student Representative for 2 years at IIIT Delhi, 2009-2011.

Volunteer Service

AWIS-ND STEM Luncheon Series **Notre Dame, IN**
Volunteer *August 2014–Present*

Assist in organizing the monthly STEM Luncheon Series with an average attendance of over 40, where invited speakers talk about resources on campus or their personal experience being a woman in STEM.

Center for Homeless **South Bend, IN**
Volunteer *August 2015–Present*

Volunteer work at center for homeless in South Bend to help the center with various tasks.

Northern Indiana Regional Science & Engineering Fair **Notre Dame, IN**
Judge *February 2016*

Judged science projects completed by school students in grades K-12.

***Communitas Opera*, IIIT Delhi** **New Delhi, India**
Co-Founder *August 2009*

Founded a club focused in improving the community, at IIIT-Delhi, by the name of "communitas opera". We conducted various events including blood donation drives in association with Rotary Blood Bank, 2010.

Professional Memberships

Association for Women in Science, Member (2015 - Present)

IEEE Student, Member (2013 - Present)

Society of Women Engineers, Member (2013 - Present)