Khyati Mahajan

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EDUCATION

University of North Carolina at Charlotte Aug 2018 - May 2023
PhD student in Computer Science under Prof Samira Shaikh *GPA 3.88*
Computational Sociolinguistics and AI

Dhirubhai Ambani Institute of ICT Jul 2013 - May 2017
Bachelor of Technology in Information and Communication Technology *GPA 3.13*
with Honors and Minor in Computational Science

COMPUTER SKILLS

Languages & Tools: Python, R, RStudio, R Shiny, Tableau, Matlab, Git
Operating Systems: Linux, MacOS
Courses: Machine Learning, Data Analytics, Natural Language Processing, Cognitive Science, Intelligent Systems

RESEARCH EXPERIENCE

Emotional Contagion and Firestorms Aug 2018 - Present
Graduate Research Assistant - *interdisciplinary project at the Department of Public Policy, Department of Psychology, Department of Communication Studies and Department of Computer Science*
UNC Charlotte

- Supplemented qualitative team participant recruitment for individual and focus group interview studies using online user interaction behavior
- Collected relevant Twitter data for studying political expression on social media and its effect on offline movements
- Analyzed Twitter user data for the effect text usage patterns have on tweet outcomes and engagement for online emotional firestorms

Hate Speech, Emotional and Moral Expression Online Aug 2018 - Present
Graduate Research Assistant - *Ribarsky Visualization Center at the Department of Computer Science*
UNC Charlotte

- Analyzed alternative social media networks for hate speech and misinformation online, especially on fringe communities on platforms formed as a response to moderation placed on free speech
- Studied emotional and moral expression surrounding online social and political movements and their impact on information contagion

Emoji Usage on Social Media Aug 2018 - Present Graduate Research Assistant - *Ribarsky Visualization Center at the Department of Computer Science*
UNC Charlotte

- Collected emoji usage data associated with the Charlotesville event on Twitter and Gab, a fringe (largely alt-right) community
- Studied differences in symbolism expressed in emoji usage that showcases ideological differences in the political expression on the two platforms

Computer Vision Tools for the Smart Kitchen Oct 2017 - Jul 2018
Research Associate - *High Performance Computing Lab, Prof Ravi Hegde*
IIT Gandhinagar and Innit Inc.

- Built a robust Barcode Detection and Decoding system in the wild using FAIR's Detectron RetinaNet module for detection
- Improved detection from 65% to 91%

Facial Emotion Recognition Jun 2017 - Sep 2017
Summer Research Fellow - *Machine Learning Lab, Prof Suman Mitra*
Dhirubhai Ambani Institute of ICT, India

- Built a facial emotion recognition neural network using Tensorflow and improved predictions using Gabor filters for pre-processing
- Achieved an accuracy of 75% on the JAFFE dataset, improved it to 78%

Meta-memory for Machine Learning Jan 2017 - Jun 2017
Research Associate - *Computational Intelligence lab, Prof Suresh Sundaram*
Nanyang Technological University, Singapore

- Conceptualized meta-memory concepts of quantifying learning from human psychological studies for use in ML techniques
- Implemented concepts using MATLAB for Meta-cognitive Interval Type-2 Fuzzy Logic Systems, making the algorithm 45% faster as a result of using 20% less data

Embedded Hunters May 2016 - Jul 2016
Summer Research Intern - *Computational Intelligence lab, Prof Suresh Sundaram*
Nanyang Technological University, Singapore

- Worked on improving optimization techniques for ML, studying gradient and coordinate descent
- Worked on the Embedded Hunters algorithm to improve black box optimization techniques
- Contributed to the Black-Box Multi-Objective Optimization Benchmarking Platform on Github

PRESENTATIONS

Analyzing Event-Specific Language Use on Gab: A Charlottesville case study
Poster Presentation August 2020
Southern Data Science Conference 2020, Atlanta, GA, USA

Attention Mechanism for Machine Translation
Oral Presentation April 2020
Club for Artificial Intelligence Research, UNC Charlotte

Emoji Usage Across Platforms: A Case Study for the Charlottesville Even
Poster Presentation Jul 2019
Widening NLP Workshop at ACL 2019, Florence, Italy
Internal Conference on Computational Social Science 2019, Amsterdam, The Netherlands

CONFERENCES ATTENDED

Computing Conferences

- Association of Computational Linguistics Conference 2019, Florence, Italy
- International Conference on Computational Social Science 2019, Amsterdam, The Netherlands

Supporting Widening Participation in Tech

- Fleurix Conference 2020, Charlotte, NC, USA
- Carolinas Women in Computing 2020, Charlotte, NC, USA
- Tapia Celebration for Diversity in Computing 2019, San Diego, California, USA

COURSE PROJECTS

Reinforcement Learning Rummy Agent Aug 2019 - Dec 2019
Machine Learning with Prof Minwoo Lee
University of North Carolina at Charlotte, USA

- Built a reinforcement learning agent using Q-learning to model the rewards in possible states for maximizing wins in a modified game of Rummy
- Placed 2 out of 20 in rummy tournament against agents built by everyone in the class

Cognitive Biases and Misinformation Aug 2019 - Dec 2019
Cognitive Science with Prof Doug Markant
University of North Carolina at Charlotte, USA

- Proposed a theoretical framework for the the role cognitive biases could play when in the spread of misinformation
- Studied various known cognitive biases and how they might interact, leading to the acceptance of a wider range of cognitive dissonance

CHISSLR - Interactive Annotation for ML Aug 2019 - Dec 2019
Data Analytics with Ryan Wesslen
University of North Carolina at Charlotte, USA

- Ported CHISSL, an interactive labelling tool, into an R shiny app and improved integration with other visualization tools
- Improved flow for helping improve classification of mislabelled examples hand-in-hand with learning

Evolving Online Human Behavior Jan 2019 - May 2019
Data Analysis and Presentation for Impact with Prof Julie Goodliffe
University of North Carolina at Charlotte, USA

- Studied Twitter data around August 2016 for analyzing response to the Summer Olympics online using the Python and Twitter Firehose API
- Presented analysis showing most activity was centered around the East coast and California and user level posting behavior using Tableau

8-puzzle and n-queens Aug 2018 - Dec 2018
Intelligent Systems with Prof Dewan Tanvir Ahmed
University of North Carolina at Charlotte, USA

- Studied A* search through the 8-puzzle problem for exploring possible nodes to find an optimized solution using the misplaced tile and Manhattan distance heuristics using Python
- Studied hill climbing techniques for finding maxima through the n-queens problem to find an optimized solution using combinations of sideways move and random restart strategies

Understanding Our Views Aug 2018 - Dec 2018
Natural Language Processing with Prof Samira Shaikh
University of North Carolina at Charlotte, USA

- Studied the Reddit community CMV (Change My View) for factors that led to a viewpoint being changed using Python and NLTK
- Analyzed change through constructive critical conversation and the components of such a conversation - contradictory examples along with rational arguments around them provided great impact

Simulating Biofilms Jan 2016 - May 2016
Nonlinear science with Prof Mukesh Tiwari
Dhirubhai Ambani Institute of ICT, India

- Studied the spread of 2D bacterial biofilms in the presence of various stimuli by generating MATLAB simulations
- Applied the SIR model for understanding information spread

Modeling Language Death Jan 2016 - May 2016
Modeling and Simulation with Prof Mukesh Tiwari
Dhirubhai Ambani Institute of ICT, India

- Modeled the dynamics of language death in a competitive bilingual setting using MATLAB
- Applied coupled differential equations with adaptive bias to model the dynamics

Food Unpairings in Cuisine Jan 2016 - May 2016
Complex Networks with Prof Mukesh Tiwari
Dhirubhai Ambani Institute of ICT, India

- Built a network of food ingredients frequently used together to analyze usage patterns
- Applied findings to food from different cuisines and reported which cuisines go well together

Other Academic Projects Aug 2013 - May 2017
Dhirubhai Ambani Institute of ICT, India

- Algorithms in the Human Context: Studied effects of society and algorithms on each other - what filter bubbles do to privacy and how society shapes the usage of these algorithms for financial gain
- Studying Parallelism Paradigms via Fractals: Simulated the Julia and Mandelbrot sets using HPC and GPU parallelism strategies in C++, OpenMP, MPI and CUDA to study benchmarking and best practices for achieving super-linear speedup

HONORS AND AWARDS

- *CRA-WP Grad Cohort for Widening Participation 2020 scholar* at New Orleans, LA
- *Graduate Assistant Support Plan* from Fall 2018 to Present from the *University of North Carolina at Charlotte* for tuition support
- *Tapia Celebration for Diversity in Computing scholar* at College of Computing and Informatics, UNCC
- *Certificate of Recognition* for outstanding academic achievement by *Duke University, North Carolina, US*. Also nominated for the Duke Talent Identification Program, India 2009 at IIM-Ahmedabad from 500 students all over India

STUDENT INVOLVEMENT

- *Student Panelist* for International Cultural Panel at UNCC — Current
- *Founding Secretary*, the Club for AI Research, UNC Charlotte — Current
- *Founding Member*, Girls Who Code, UNC Charlotte — Current
- *Member*, ACM-W, UNC Charlotte — Current
- *Vice Chairperson*, IEEE Student Body (SB), DAIICT — Past
- *Chairperson*, IEEE SB Women In Engineering Affinity Group, DAIICT — Past