

Khyati Mahajan

kmahaja2@uncc.edu · mahajan.khyati@gmail.com · +1 (980) 345-9060
LinkedIn:khyati-mahajan · Github:khyatimahajan · Website:khyatimahajan.com

EDUCATION

University of North Carolina at Charlotte Aug 2018 - May 2023
MS and PhD student in Computer Science under Prof Samira Shaikh
Computational Sociolinguistics and AI GPA 3.89 / 4

Dhirubhai Ambani Institute of ICT Jul 2013 - May 2017
Bachelor of Technology in Information and Communication Technology GPA 3.13 / 4
with Honors and Minor in Computational Science

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

- Collected relevant Twitter data for studying political expression on social media and its effect on offline movements
- Performed statistical analysis using hierarchical regression analysis to study interactions when different linguistic features are used together using R
- Led the ideation and building of a mock social media platform modeled behind Twitter to perform controlled user studies
- Conducted pilot study and performed exploratory analysis to quantify and measure the properties of the mock platform pertaining to emotional contagion and regulation for computational social science research

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 largely unmoderated alternative social media networks for hate speech and misinformation online using data analytics based on Offenseval data and contextual word embeddings such as ELMo and BERT
- Extracted opinions expressed online on public policy and analyzed perception patterns over time using LDA topic modeling
- Studied emotional and moral expression surrounding online social and political movements and their impact on information contagion
- Utilized stance identification for argument mining and summarization by hashtag use to study political and ideological polarization as reflected in online conversations and debates

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 Charlottesville 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
- Studied language use expressing solidarity during the crises events of the Paris attacks, Hurricane Irma, and Charlottesville

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

PUBLICATION HISTORY

Community Connect: A Mock Social Media Platform to Study Online Behavior

March 2021

Demonstration Paper

International Conference on Web Search and Data Mining (WSDM) 2021

PRESENTATIONS

Studying The Effect of Emotional and Moral Language on Information Contagion during the Charlottesville Event

July 2020

Poster Presentation

Widening NLP Workshop at virtual ACL 2020

Analyzing Event-Specific Language Use on Gab: A Charlottesville case study

August 2020

Poster Presentation

Southern Data Science Conference 2020, Atlanta, GA, USA

Emoji Usage Across Platforms: A Case Study for the Charlottesville Even

Jul 2019

Poster Presentation

Widening NLP Workshop at ACL 2019, Florence, Italy

Internal Conference on Computational Social Science 2019, Amsterdam, The Netherlands

CONFERENCES ATTENDED

Computing Conferences

- Virtual International Conference on Computational Linguistics 2020
- Virtual Empirical Methods in Natural Language Processing 2020
- Virtual SIGDIAL 2020
- Virtual Association of Computational Linguistics Conference 2020
- Southern Data Science Conference 2020, Atlanta, GA, USA
- Association of Computational Linguistics Conference 2019, Florence, Italy
- International Conference on Computational Social Science 2019, Amsterdam, The Netherlands

Supporting Widening Participation in Tech

- 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

CHISLR - Interactive Annotation for ML

Aug 2019 - Dec 2019

Data Analytics with Ryan Wesslen

University of North Carolina at Charlotte, USA

- Ported CHISL, 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

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

- Food Unpairings: Built a network graph of food ingredients frequently used together to analyze usage patterns and applied findings to food from different cuisines and reported which cuisines go well together

HONORS AND AWARDS

- *CRA-WP Grad Cohort for Widening Participation 2021 scholar* at New Orleans, LA
- *Graduate Assistant Support Plan (GASP)* since Fall 2018 from UNC Charlotte for tuition support
- *Tapia Celebration for Diversity in Computing scholar* at College of Computing and Informatics (CCI), UNC Charlotte
- *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

LANGUAGES & SKILLS

Languages English, Hindi, Marathi, Gujarati, French

Skills Python, R, Data Science, Data Analysis, Data Visualization, Natural Language Processing, Natural Language Understanding, Natural Language Generation

STUDENT INVOLVEMENT & VOLUNTEERING

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| · <i>Graduate Life Ambassador</i> at UNC Charlotte | 2020-Present |
| · <i>Student Panelist</i> for International Cultural Panel at UNC Charlotte | 2020-Present |
| · <i>Founding Secretary</i> , the Club for AI Research, UNC Charlotte | 2019-2020 |
| · <i>Founding Member</i> , Girls Who Code, UNC Charlotte | 2019-2020 |
| · <i>Member</i> , ACM-W, UNC Charlotte | 2018-2020 |
| · <i>Vice Chairperson</i> , IEEE Student Body (SB), DAICT | 2016-2017 |
| · <i>Chairperson</i> , IEEE SB Women In Engineering Affinity Group, DAICT | 2016-2017 |