Marichi Gupta

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EDUCATION

The University of North Carolina, *Chapel Hill, NC*
B.S. in Math, B.S. in Computer Science, minor in Music; GPA: 3.900, Phi Betta Kappa *Aug. 2017 – Dec. 2021*
Relevant Courses: Deep Learning, Machine Learning, Quantum Computing, Graduate Algorithms, Foundations of Programming (OO-design), Complex Variables, Graduate Analysis, Linear Algebra, Partial Differential Equations, Graduate Topology.

WORK EXPERIENCE

McKinsey & Co., *Stamford, CT*
Incoming Business Associate *starting August 5, 2022*

Harvard Medical School, MGH-Institute for Technology Assessment, *Boston, MA*
Research Intern - Jalali Lab *Jan. 2020 – Jan. 2022*

- The Jalali Lab uses multidisciplinary approaches to assess and improve the effectiveness of health-care policies.
- Analyzing Reddit and Twitter for perceptions towards the opiate crisis using machine learning/natural language processing methods. Studied the weather's impact on COVID-19 transmission, and separately studied the perception of weather's impact via Twitter. Work resulted in three publications.
- Designated project lead for the NLP analyses, managing four other interns.

Intelligent Machines Lab (IML), *Waltham, MA*
Software Engineer Intern *June 2019 – Aug. 2019*

- Designed and implemented a file parser for extracting and writing relevant data from business documents to JSON files. Implemented trie data structure for keyword matching; included synonym support for common business terms. Prepared javadoc for project hand-off. Used Apache Tika, Gson, Tesseract, Maven.
- Subsidiary company of Innospark Ventures. IML develops technology for applications sold by sibling companies.

Art of Problem Solving (AoPS), *San Diego, CA*
Grader and Teaching Assistant *Feb. 2019 – present*

- Contracted remote worker to grade and leave detailed feedback on homework for AoPS's online classes.
- Serve as a teaching assistant for online courses, helping students individually in the class chatroom.

UNC Math Department, *Chapel Hill, NC*
Teaching Assistant *June 2018 – Aug. 2018*

- Invited by Department Chair to TA for MATH294 (Undergraduate Seminar), a summer bridge course for incoming cohort of twenty Chancellor's Science Scholars.
- Led daily recitations and held daily office hours; instructed students as a group and one-on-one during class time, office hours, and recitation. Full grading responsibilities.

RESEARCH EXPERIENCE & PUBLICATIONS

1. Beck, T.[†], **Gupta M.**[†], and Marzuola, J.L.[†], "Nodal Set Openings on Perturbed Rectangular Domains." Submitted (2022). https://doi.org/10.48550/arXiv.2204.12009
2. Garcia G., Dehghanpoor R., Stringfellow E., **Gupta M.**, Rochelle J., Mason E., Pujol T., Jalali M.S., "Identifying and Characterizing Medical Advice-Seekers on a Social Media Forum for Buprenorphine Use." In revision with International Journal of Environmental Research and Public Health (2022). https://doi.org/10.1101/2021.08.25.21262427
3. Xu R., Rahmandad H., **Gupta M.**, DiGennaro C., Ghaffarzadegan N., Amini, H., Jalali M.S., "Weather, air pollution and SARS-CoV-2 transmission: a global analysis" (2021), The Lancet Planetary Health: https://doi.org/10.1016/S2542-5196(21)00202-3
   - Press coverage in The New York Times, "Will Hot Weather Kill the Coronavirus Where You Live?".
4. **Gupta M.**, Bansal A., Jain B., Rochelle J., Oak A., Jalali M.S., "Whether the Weather Will Help Us Weather the COVID-19 Pandemic: Using Machine Learning to Measure Twitter Users' Perceptions" (2021), International Journal of Medical Informatics: https://doi.org/10.1016/j.ijmedinf.2020.104340

Pure Math Research: Analysis/Mathematical Physics
Adviser(s): Jeremy Marzuola, Thomas Beck *Aug. 2019 – Apr. 2022*

- Senior thesis on Laplacian eigenfunctions on perturbed rectangular domains. Summer research funding to continue work, resulting in joint publication.

PROGRAMMING PROJECTS & SKILLS

Exam Similarity Analysis, *UNC Honor System*

- Used Apache POI in Java to scan Excel files containing student responses for multiple choice exams and measure similarity between exams; used igraph in Python to generate and visualize networks of potential student collaboration.

Counsel Manager, *UNC Honor System*

- Used Google Sheets API, Javascript to read case docket in real time and track counsel assignments to cases. Helps case managers assign cases and balance workload among counsels. Implemented using the Observer Pattern.

Languages: Proficient in Java, Python, Mathematica, MATLAB, LaTeX; Familiar with JavaScript, C.

Skills: Design Patterns (MVC, Observer, Commands, Undo/Redo, Factory, other Gang of Four patterns); Apache Tika, PDFBox, POI; Git, Maven; sklearn, matplotlib, geopy, numpy, pandas, NLTK, gensim, Word2Vec, Pytorch.

[†]Equal contribution

COMMUNITY INVOLVEMENT

UNC Honor System

Deputy Student Attorney General, Attorney General's Staff *Sept. 2017 – Aug. 2021*

- Investigate initial reports of misconduct and make a determination of whether to pursue the case or not. One of five members on the senior leadership for the system.
- Previously managed student honor court cases as a neutral third party. Mentor and advise counsels on case prep and argumentation. Schedule and coordinate hearings. Appointed to Committee of Student Conduct, which oversees the UNC Honor System. As counsel, investigated incidents, gathered evidence, and advocated for reporting parties and accused students in hearings.

AWARDS & HONORS

SURF Grant Recipient, Taylor Fellowship: Awarded summer funding for math research, Summer 2021.
Stephen E. Hyde Memorial Scholarship: Awarded by Phillips Exeter Academy by faculty vote for the first year at UNC.
D.E. Shaw Nexus Fellowship: Invited by application to attend a three-day educational event at D.E. Shaw Co. headquarters. Attended sessions on behavioral finance, corporate development, and quantitative strategies. August 2019.
Virginia Tech Math Competition: Score of 10/70 on Fall 2018 competition. Placed 4th for UNC-CH, T134/792 nationally.