Rujul Gandhi

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Education

2018 - 2023 — **Massachusetts Institute of Technology**
- MEng 2023 in Electrical Engineering & Computer Science, Concentration in AI. GPA: 5.0.
- MEng Thesis: *Identification of Atomic Propositions in English Instructions for Flexible Translation to Robot Planning Representations.*
- SB 2022 in Linguistics, Electrical Engineering & Computer Science. GPA: 4.7.
- Coursework: 6.011 *Signals, Systems, and Inference*, 6.036 *Machine Learning*, 9.390 *Language in the Brain*, 6.806/6.884 *Advanced Natural Language Processing*, 24.962 *Advanced Phonology*, 9.660 *Computational Cognitive Science*

Research

Oct 2023 - Current — **Associate Specialist in Speech Neuroscience**, *UC San Francisco*
- Computational modeling of the brain's response to natural speech.
- Supervisors: Shailee Jain (immediate), Edward Chang

Sept 2022 - June 2023 — **Graduate RA in NLP**, *Reliable Autonomous Systems Lab, MIT AeroAstro*
- Using pretrained language models to convert natural language constraints into logical representations for robotic planning.
- Work resulted in an MEng thesis and a conference paper.
- Supervisor: Chuchu Fan

Jan 2022 - May 2022 — **UROP in Emergent Communication**, *Interactive Robotics Group, MIT CSAIL*
- Worked on reinforcement learning experiments to study emergent communication between collaborating neural network agents.
- Supervisors: Mycal Tucker (immediate), Julie Shah

Mar 2020 - May 2022 — **UROP in Phonetics & Acoustics**, *MIT Linguistics*
- Conducted a study of retroflex production in the context of language interaction.
- Responsibilities included experiment design, audio data collection and annotation using Praat, and data analysis using R.
- Supervisor: Edward Flemming

Industry Experience

June 2023 - August 2023 — **Building speech recognition for low-resource languages**, *MIT-IBM Watson AI Lab*
- Summer internship carrying out research and software implementation for improved speech technology.
- Supervisor: Yang Zhang

June 2021 - Aug 2021 — **Engineering prosthetic voices**, *VocaliD*
- Interned at a voice AI company creating synthetic voices for individuals and organizations.
- Quality tested voice synthesis output, automated data compilation, and helped expand the company's reach into new languages and services.

Dec 2020 - Feb 2021 — **Connecting refugees to interpreters**, *Tarjimly*
- Established global partnerships for a tech nonprofit that provides on-demand interpretation and translation.
- Designed a language tree feature specification to improve beneficiary-interpreter matching in the Tarjimly app.

Conference Abstracts/Papers

2024 **Deep neural networks reveal context-sensitive speech encoding in single neurons of human cortex**, *S Jain, R Gandhi, S Hu, MK Leonard, EF Chang*
- Computational Systems Neuroscience (CoSyNe) 2024 - Selected for oral presentation
- Computational Cognitive Neuroscience (CCN) 2024 - Selected for oral presentation
- From Neuroscience to Artificially Intelligent Systems (NAISyS), CSHL 2024 - Selected for oral presentation
- Advances & Perspectives in Auditory Neuroscience (APAN) 2024 - Selected for poster highlights
- Society for Neuroscience (SfN) 2024 - Selected for nanosymposium

2023 **NL2TL: Transforming Natural Languages to Temporal Logics using Large Language Models**, *Y Chen, R Gandhi, Y Zhang, C Fan*
- EMNLP 2023

Awards and Fellowships

2023 SERC (Social and Ethical Responsibilities of Computing) Scholar, MIT Schwarzmann College of Computing

2021 Burchard Scholar, MIT School of Humanities, Arts, and Social Sciences

Teaching

Jan 2022 - May 2023 **Part-time Tutor**, *Inspirit AI, Middle School Program*
- Led 5th-8th graders through online programs covering introductory Python exercises, concepts of machine learning, and discussions on AI ethics.
- In addition to summer and winter intensive programs, was the lead instructor for school partnerships with the Hun School of Princeton (Summer 2022) and the Valley School of Ligonier (2022-23 Academic Year).

Fall 2021 **Teaching Assistant**, *9.19: Computational Psycholinguistics*

Spring 2021 **Lab Assistant**, *6.009: Fundamentals of Programming*

Jan 2020 **MIT Global Teaching Labs**, *Nazarbayev Intellectual Schools, Kazakhstan*
Taught workshops on linguistics and molecular biology to high school students.

Skills

Technical: Python, ML Libraries (PyTorch, Tensorflow), R, SQL, Praat, C/C++

Languages: English (native), Marathi (native), Hindi (fluent), Urdu (fluent), German (elementary), Sanskrit

Activities

Feb 2019 - Feb 2022 **MIT Educational Studies Program**
- Director, Splash 2020: Designed the first virtual version of ESP's largest annual educational program.
- Co-directed educational programs serving thousands of students and hundreds of volunteer teachers.

Sept 2019 - Sept 2021 **Asia-Pacific Linguistics Olympiad**
- International Jury Chair and Member of the Board for APLO 2020 and 2021. Member of the jury, APLO 2019. Problem Committee Chair for Panini (Indian national) Linguistics Olympiad, 2023-2025.
- Directed the efforts of 11 jury members to create multilingual problem sets featuring language-based logic puzzles, for participants across the Asia-Pacific region.

Sept 2021 - May 2023 **MIT Women's Lightweight Crew.**