MEGHAVARSHINI KRISHNASWAMY

PhD Candidate
University of Arizona
Department of Linguistics
Communication Bldg Room 109
Tucson, Arizona - 85721, USA

mkrishnaswamy[at]arizona.edu
meghavarshini-krishnaswamy
meghavarshini-krishnaswamy
meghavarshini
meghavarshini.github.io

OBJECTIVE

I am a computational linguist and phonetician. I am interested in an interdisciplinary research career and mentorship role, where I can work with language and behavioural data, and applied computational methods. I want to mentor the next generation of scientists, with a focus on data science principles, project management, and quantitative and qualitative methods for human subject data collection. I aim to add to their knowledge and experience in experimental and applied linguistics.

EDUCATION

- **University of Arizona** *Aug 2019–June 2025 (expected)*
  PhD, Linguistics Tucson Arizona, USA
  - GPA: 3.9/4.00

- **University of Arizona** *Aug 2019–May 2021*
  MS, Human Language Technology Tucson Arizona, USA
  - GPA: 3.9/4.00

- **The English and Foreign Languages University** *July 2013–May 2015*
  MA, Linguistics Hyderabad, India
  - GPA: 72.9%

- **University of Delhi** *July 2010–June 2013*
  BA (Hons.), English New Delhi, India
  - Score: 59.8%, II-Division

ACADEMIC RESEARCH EXPERIENCE

- **Data Science Institute [🌐]** *Aug 2023–Present*
  Graduate Research Assistant (educator and consultancy) Tucson, USA
  - Designed and delivered technical workshops encompassing NLP, python programming, command line interface proficiency, version control, High Performance Computing (HPC), and AI tools for research. See associated Github repository [].
  - Collaborated in creating a language processing pipeline for quantum NLP applications in low-resource languages.
  - Spearheaded a collaboration with computational linguistics faculty, for improving HPC understanding and knowledge.
  - Provided consulting services for university research projects (data science and NLP), for the successful execution and optimization of these projects.

- **DARPA ASIST-ToMCAT Project (NLP) [🌐]** *May 2020 - Dec 2023*
  Graduate Research Assistant Tucson
  - Designed and enhanced existing unsupervised neural network models for detecting speech synchrony/entrainment [].
  - Contributed code, research insights, and qualitative assessments for vocal feature extraction using OpenSMILE, Praat and Python.
  - Reported on the viability of different voice recording platforms for collecting human subject data and automatic transcriptions, and performed quality assessments.

- Performed literature reviews and assessed datasets for multimodal sentiment and emotion classification projects.
- Provided documentation and writing for effective communication of our research findings for DARPA Principal Investigators (PIs) Meetings and Github documentation.
- Contributed research to publications presented at NeurIPS and ICML (See publications [W1, W2, C1, C5, C6].

- **Douglass Phonetics Lab (applied linguistics)) [🌐]** *Jan 2020 - Dec 2020*
  Graduate Research Assistant Tucson
  - Coordinated the lab's ongoing phonetics experiments and data collection.
  - Initiated the migration of the lab's experiments to remote platforms (like Finding Five) during the pandemic, and assessed their viability.
  - Provided training and technical support to undergraduate researchers.
  - Contributed documentation for the data exploration and statistical analysis.
  - Conducted transcription and extraction of phonetic data on Praat.
  - My research contributed to publication [C3].

- **SPLANG Phonetics Lab (phonetics and psycholinguistics), EFL University** *Oct 2017 - Aug 2019*
  Research Associate Hyderabad, India
  - Designed and conducted acoustic phonetics experiments for languages such as Bengali, Mongolian, Malayalam and Hindi.
  - Conducted corpus analysis and qualitative assessments on multi-lingual internet corpora to find stimuli for experiments.
  - Created audio stimuli using Praat and ffmpeg for eye-tracking experiments and perception tasks.
  - Wrote R and Python scripts for statistical analysis and data visualisation.
  - Co-authored papers, conference posters, research proposals and presentations.
  - Provided training to students for experimental modalities such as ultrasound, eye-tracking, and speech perception and production.
  - Managed administrative tasks such as purchase requests, lab equipment setup, documentation for datasets, scheduling lab activities, and drafting the lab's budget and spending.
  - My research contributed to publication [C2, C4, P1, C7, C8].

Teaching Experience

- **LING314: Phonetics, [Instructor on record]** *Jan 2023 - May 2023*
  Tools: D2L, Praat, Qualtrics [🌐]
  - Introduced core topics in phonetic science and the articulation, acoustic processing, and perception of human speech, with a focus on the prosodic properties and the phonetic structure of different dialects of English.
  - Taught the fundamentals of transcribing sound patterns with the International Phonetic Alphabet and the terminology for phonetic features.
  - Lead lab sessions to collect, process, and analyze acoustic features, and read spectrograms for different consonants and vowels.

- **LING432 (5-week, online), Psychology of Language [Instructor on record]** *Summer 2022 and 2023*
  Tools: D2L, Panopto [🌐]
  - Introduced topics in language processing.
  - Created teaching materials on comprehension and production of sounds, words, and sentences, and the psychological processes involved.
  - Lead discussions on bilingual processing, speech errors, and artificial speech.
  - Designed student assignments and quizzes, and provided feedback on academic writing.
  - Recorded weekly lectures on Panopto.

- **LING150, Language and the World [Grader]** *Aug - Dec 2019*
  Tools: D2L, Panopto, MS Office suite [🌐]
  - Conducted weekly section meetings and office hours.
  - Provided detailed feedback and evaluation on student's assignments.
  - Supported students with the design of a constructed language and documenting its grammar.

- **Teach for India, Hyderabad** *May 2015 - Apr 2015*
  5th and 6th grade [🌐]
  - Taught 6th grade English and Science, and 5th grade Maths and Environmental Sciences.
  - Participated in and conducted rigorous teacher-training programs.
  - Raised approximately 82,000 INR to set up a digital classroom, class library and fund a sports training program.

PUBLICATIONS

C=PROCEEDINGS, P=POSTER, W=PUBLICATION IN PROGRESS,

C1. Soares, P., Pyarelal, A., Krishnaswamy, M., Butler, E. & Barnard, K. *Probabilistic Modeling of Interpersonal Coordination Processes* in *Forty-first International Conference on Machine Learning* (2024). https://proceedings.mlr.press/v235/soares24a.html.

C2. GP, S., Krishnaswamy, M., Mishra, R. & Dutta, I. *Mismatched coarticulatory information hinders lexical access of coronal stops in Malayalam* in *Proceedings of the 20th International Congress of Phonetic Sciences* (2023), 371–375. https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2023/full_papers/657.pdf.

C3. Krishnaswamy, M. & Warner, N. *Perception of Malayalam three-way stop contrast among American English speakers* in *Proceedings of the 20th International Congress of Phonetic Sciences* (2023), 401–405. https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2023/full_papers/682.pdf.

C4. Mitra, A., Krishnaswamy, M. & Dutta, I. *Coarticulation and contrast in a vowel harmony system: coarticulatory propensity in Khalkha Mongolian VCV sequences* in *Proceedings of the 20th International Congress of Phonetic Sciences* (2023), 2246–2250. https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2023/full_papers/1043.pdf.

C5. Pyarelal, A., Duong, E., Shibu, C. J., Soares, P., Boyd, S., Khosla, P., Pfeifer, V., Zhang, D., Andrews, E. S., Champlin, R., *et al. The ToMCAT Dataset* in *Thirty-seventh Conference on Neural Information Processing Systems Datasets and Benchmarks Track* (2023). https://papers.nips.cc/paper_files/paper/2023/file/803d8d4b4a549d0d062fc704f8659ce3-Paper-Datasets_and_Benchmarks.pdf.

C6. Culnan, J., Park, S., Krishnaswamy, M. & Sharp, R. *Me, myself, and ire: Effects of automatic transcription quality on emotion, sarcasm, and personality detection* in *Proceedings of the Eleventh Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis* (2021), 250–256. https://aclanthology.org/2021.wassa-1.26.pdf.

C7. Dutta, I., Redmon, C., Krishnaswamy, M., Chandran, S. & Raj, N. *Articulatory complexity and lexical contrast density in models of coronal coarticulation in Malayalam* in *Proceedings of the 19th International Congress of Phonetic Sciences* (2019). https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS2019/papers/ICPhS_2041.pdf.

C8. Krishnaswamy, M., Dutta, I. & Banerjee, U. *Active cavity expansion through lingual adjustments to place of constriction in voiced geminates* in *Proceedings of Meetings on Acoustics* **33** (2018), 060002. https://asa.scitation.org/doi/pdf/10.1121/2.0001024.

P1. Krishnaswamy, M., Dutta, I. & Bhaumik, M. *Alveolar stops exhibit greater coarticulatory resistance than retroflexes and dentals in Malayalam* The Journal of the Acoustical Society of America. 2020. https://doi.org/10.1121/1.5147168.

W1. Krishnaswamy, M., Soares, P. & Pyarelal, A. *Multi-party vocal entrainment as a timeseries problem* Draft. 2025.

W2. Meghavarshini, K. *Vocal entrainment in multi-party conversations: an exploration of automated and experimental approaches* Dissertation in progress. PhD thesis (The University of Arizona, 2025).

Skills

- **Programming and Scripting:** Python, R, Praat scripting, Command Line Interface
- **Web Technologies:** D2L, Google Docs, Panopto
- **Data and Code Management Systems:** Pandas, Bee Keeper, Excel, git
- **NLP, Data Science & Machine Learning:** Pytorch, ScikitLearn, PyKaldi, SpaCy, NLTK, Matplotlib, Pandas, Numpy, Notebooks, WhisperAI, SpeechBrain, Ollama, Jupyter
- **NLP and Phonetics:** SpaCy, NLTK, Beautiful Soup, perl, Ollama, WhisperAI, SpeechBrain, Praat, Parseltongue, Kaldi, OpenSMILE, ffmpeg
- **Mathematical & Statistical Tools:** numpy, scipy, ggplot, lme4, dplyr, gss
- **Other Tools & Technologies:** imagemagik, bash, grep, ssh
- **Documentation and editing:** LaTeX, MS Word, RMarkdown, knitr, MKdocs, github pages

Fellowships and Awards

- **Data Science Fellowship** *Jan - Apr 2023*
  Data Science Institute, University of Arizona [🌐]
  - Training for data management planning, research reproducibility and accessibility, and effective software documentation.
  - Awarded a cash stipend of $6000.
  - Submitted a paper+code sample Github repository as my capstone project [].

- **Artistic Expression of Original Research** *Oct 2024*
  Institute for Resilience, University of Arizona [🌐]
  - Selected to participate in a 3-day retreat, with workshops and talks on science communication, artistic techniques.
  - Created a mixed-media installation depicting my doctoral research for three public exhibitions.

- **Travel award** *July 2023*
  Department of Linguistics, University of Arizona
  - Awarded $1000 towards research travel to the International Congress for Phonetic Science 2023 for presenting [C2–C4].

- **Research Fund Award** *February 2022*
  Department of Linguistics, University of Arizona
  - Awarded $800 towards experimental research contributing to publication [C3].

Leadership Experience

- **Coordinator, Arizona Linguistics Circle Conference** *May 2022 - Oct 2021*
  University of Arizona [🌐]
  - Build the Easychair abstracts submission portal.
  - Recruited reviewers and coordinated the double-blind peer review.
  - Managed all communications with authors.
  - Created documentation for all procedures.

- **Coordinator, Arizona Linguistics Circle Conference** *May 2021 - Oct 2021*
  University of Arizona [🌐]
  - Managed social media accounts across multiple platforms.
  - Created PR materials for disseminating information on the conference.
  - Created profiles for authors and their submissions.

- **Office bearer, Arizona Linguistics Circle** *Jan 2021 - Present*
  University of Arizona [🌐]
  - Represented the student body in faculty meetings.
  - Managed equipment and amenities in the student spaces.
  - Mentored incoming graduate students.
  - Volunteered in presentations and university showcases.

SERVICE

- **Reviewer, Cayote papers** *Oct 2021*
  University of Arizona [🌐]
- **Reviewer** *Mar 2023*
  Peer J Computer Science [🌐]

REFERENCES

1. **Natasha Warner**
   Professor, Department of Linguistics
   The University of Arizona
   Email: nwarner@arizona.edu
   Phone: +1-520-626-5591
   Relationship: Dissertation Advisor

2. **Indranil Dutta**
   Professor, School of Languages and Linguistics
   Jadavpur University, Kolkata
   Email: indranildutta.lnl@jadavpuruniversity.in
   Relationship: Principle Investigator, dst-csri project: 'Influence of coarticulation on lexical access'

3. **Carlos Lizárraga**
   Computational & Data Scientist Educator, Data Science Institute
   The University of Arizona
   Email: clizarraga@arizona.edu
   Relationship: GRA Supervisor