Special session at INTERSPEECH 2024, 1–5 September, 2024, Kos Island, Greece:

Computational models of human language acquisition, perception, and production

Deadline: 2 March 2024

Submissions: https://interspeech2024.org/paper-submission/

Introduction

The main goal of the special session is to bring together researchers who use computational modeling as a means to study human language acquisition, perception, or production. Computational modeling is a research method that complements empirical and theoretical research on the aforementioned topics by creating algorithmic implementations of theories on human language processing, thereby enabling testing of the feasibility and scalability of these theories in practice. Models can also act as learnability proofs by demonstrating how language behaviors are achievable with a specific set of cognitive processes ("innate mechanisms and biases"), input/output data ("the environment model"), and potential physiological constraints.

Due to the interdisciplinary nature of spoken language as a phenomenon, computational modeling research is currently dispersed across different conferences and workshops in areas such as speech technology, natural language processing, phonetics, psycholinguistics, cognitive science, and neuroscience. Our primary aim is to bring together people working in these different areas but who use computational modeling as a part of their work.

Recent advances in machine learning and statistical modeling have resulted in increasingly powerful computational models capable of explaining several aspects of human language behaviors. This means that the methodologies used in computational modeling and contemporary speech technologies are also becoming increasingly similar, such as using self-supervised learning to learn useful speech representations. At the same time, computational models of human speech processing benefit from technical expertise in speech processing and theoretical understanding of speech as a phenomenon—traits that are characteristic of the Interspeech community. Therefore, another goal of this special session is also to encourage and facilitate cross-disciplinary collaboration between technology and science -oriented researchers in the study of human language.

Topics

We will accept submissions from any of the three areas and papers bridging them: language acquisition, speech perception, and speech production. The key requirement is that the submitted papers should use computational models to study human language processing, provide novel theoretical or conceptual insights to computational research, or describe novel technical tools, datasets, or other resources that support computational modeling research. The emphasis will be on speech behaviors and studies involving speech audio, articulatory data, and other biosignals.

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Potential topics include both L1 and L2 processing, such as (but not limited to):

- Models of sub-word, lexical, and/or syntactic perceptual learning
- Models of articulatory learning
- Models of spoken word recognition or other aspects of speech perception
- Models of speech planning and motor control
- Multimodal models (e.g., visually-grounded speech learning, audiovisual perception)
- Articulatory models
- Models bridging language acquisition and adult speech behaviors
- Models of bilingual acquisition, comprehension and production
- Models of dyadic or multi-agent interaction
- Embodied models
- Self-supervised learning of speech representations
- Bayesian models of language acquisition and speech communication
- Data, evaluation practices, or other tools and resources for computational modeling of human speech behaviors.

We also encourage machine learning and speech technology researchers to submit their technical work on unsupervised or self-supervised acquisition of speech units (e.g., phones, syllables, words, syntax) and analysis of language representations in deep learning models, if these models can explain acquisition of language structures without supervised learning.

Organizers

- Okko Räsänen (Tampere University, Tampere, Finland)
- Thomas Hueber (GIPSA-lab, Grenoble, France)
- Marvin Lavechin (GIPSA-lab, Grenoble, France)