VoCS Application - Soumya Kaim

1. CV

The europass CV can be viewed via this link.

2. Letter of Motivation

Dear VoCS Selection Committee,

I am Soumya Kaim, a prospective PhD student from the University of Groningen. My research interests center on how neural mechanisms shape the perception of auditory signals, a theme that emerged during my Master's thesis, "Sensorimotor Confusions and Their Impact on Auditory Perception". My work involved designing an EEG experiment to investigate how conflicting sensory inputs alter auditory processing, implementing Python-based time-frequency analysis for signal processing, and developing custom robotic perturbation setups to simulate sensorimotor conflicts. Through this, I cultivated a deep understanding of how sensory prediction errors influence perception, an insight I am eager to expand in VoCS projects (#1, #2, and #7).

My academic training aligns directly with the project's objectives. I have expertise in auditory neuroscience, programming (Python, R, LaTeX), and neuroimaging, and I have hands-on experience working with biological signal processing techniques. In my Master's program, I designed EEG paradigms and performed spectral analysis of auditory evoked potentials to examine real-time auditory prediction errors. In addition to EEG, I have a strong theoretical grasp of fMRI methodologies, particularly signal preprocessing, statistical modeling, and pattern decoding, skills that are central to investigating shared and diverging networks for human and artificial voice processing.

Furthermore, my interest in voice communication science extends beyond EEG and fMRI. During my coursework on the course Biological Basis of Behavior, I extensively studied how vocalization patterns serve as behavioral and neural markers across species. This included acoustic analysis of vocalization cues in different species using PRAAT, which equipped me with skills in phonetic and prosodic analysis relevant to synthetic speech processing. I am particularly excited to apply this knowledge to explore perceptual correlates of voice naturalness and contribute to experimental paradigms examining normal-hearing vs. hearing-impaired populations.

Collaboration is a defining aspect of my research experience. I have worked in interdisciplinary teams across India and the Netherlands, integrating psychology, neuroscience, and computational modeling. For example, I contributed to a publication (DOI: 10.1038/s41380-023-02345-z) on

the evolutionarily conserved role of the Drd2 gene, where I applied quantitative methods to analyze social behavior dynamics. These skills will be valuable in working with multimodal datasets in the VoCS network and collaborating with teams at the University of Oslo, Universidad Pompeu Fabra, and Cochlear Ltd. Additionally, I look forward to working in international secondments, as I have experience navigating the complexities of new environments as well as multicultural teams during my studies in two very culturally different and diverse cities.

The VoCS projects (#1, #2, #7) align deeply with my research background and career aspirations. Project #1 (Oslo) builds on my expertise in EEG and fMRI to examine neural processing of scream calls and rough sounds across species, aligning with my previous work on social interactions and auditory signal analysis. Project #2 (Aix-Marseille) connects to my computational neuroscience background, where I have modeled auditory perception and analyzed phonetic characteristics of speech signals, making me well-suited to study artificial voice prosody and social competence in human-robot interactions. Finally, Project #7 (Jena) directly relates to my Master's thesis on sensorimotor prediction errors in auditory perception, where I used EEG and fNIRS to study auditory processing dynamics. My experience in neurophysiological and behavioral paradigms, combined with my expertise in computational modeling and signal processing, equips me to contribute meaningfully to these projects and to the broader VoCS network.

I look forward to the opportunity to join the VoCS network and contribute to the scientific advancement of voice perception research. Thank you for your time and consideration.

3. Contact Details of the Referees

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My supervisor for my minor project from Feb 2023 ~ July 2023.

3.2 Dr. Mark R. Nieuwenstein
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My track coordinator, professor for two courses (Models of Cognition and Cognitive Neuroscience 1), as well as the grader for my symposium presentation.