Design and Development of an Interactive Web-based Demonstration of Machine Learning Algorithms for Speech Analysis.

In Brief

- Keywords: Machine Learning, Speech Processing, Open-Source Platforms, Web development
- Duration: 4-6 months
- Location: LISN (site “belvédère”), Université Paris-Saclay
- Compensations: 700€ monthly, transport and canteen subsidies
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Context

To support research in speech analysis using Machine Learning (ML), the M3 team (Models, Methods and Multilingualism) of LISN develops PTAL (https://ptal.lisn.upsaclay.fr/), an open-source platform focused on developing probabilistic models of speech and languages. While PTAL support researchers’ work, the complexity of the models proposed in the platform is a strong obstacle for the linguistic community. There is a need for interactive systems enabling varied users to understand and use tools offered by PTAL.

The internship will leverage Marcelle (https://marcelle.dev//), another open-source platform developed at LISN by the AMI team (Architectures and Models Interaction). Marcelle is dedicated to the development of web-based pedagogical applications illustrating machine learning algorithms.

Mission

The aim of this internship is to use PTAL toolkit to develop interactive demonstrations of speech-oriented machine learning systems. The main focus will be to create — with Marcelle — a didactic example illustrating how Bayesian inference algorithms implemented in PTAL can retrieve the articulation features of vowel production. Amon other thinks, the selected candidate will have to:
- develop new software component in Marcelle dedicated to process audio data (recording, visualisation, ...).
- create a Marcelle dashboard with PTAL backend demonstrating an example of Bayesian learning

The selected candidate will have to interact with researchers and engineers to understand the salient aspects of the speech-processing model and how to represent it on a dashboard-like graphical environment. The internship will take place in the LISN laboratory in a collaboration between the M3 and AMI teams specialized in speech and language processing and human-computer interaction, respectively. It is not necessary for the candidate to be trained on machine learning or speech processing methods but a strong interest in these field is a plus.

Required skills

- Practical knowledge of web development (frontend)
- Software development skills in Julia and Javascript are appreciated
- Interest in machine learning and data visualization

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