



Research Engineer Position in Automatic Speech Recognition for Computer-Assisted Language Learning (CALL) applications

Advisors: Isabelle Ferrané, Thomas Pellegrini and Julien Pinquier (IRIT, France), Lionel Fontan (Archean LABS, Montauban, France).

Context

ALAIA (AI-assisted language learning) is a joint laboratory, supported by the LabCom program of the French National Research Agency, between the SME Archean Technologies (Montauban, France) and IRIT (Toulouse Institute of Computer Science Research, UMR 5505 CNRS-INP-UT3-UT1-UT2J, Toulouse, France).

ALAIA joins the complementary skills of the academic and industrial partners for the development of foreign-language learning applications. For this purpose, ALAIA adopts a multidisciplinary perspective combining foreign language pedagogy, linguistics, and data science. Within this context and in order to strengthen our development team, we are looking for 2 research engineers in computer science with complementary profiles.

Job description

The automatic assessment of the **phonetic-phonological skills** of foreign-language learners requires:

- machine learning approaches to detect, localize and characterize pronunciation errors;
- appropriate and customized feedback given to learners as a function of their profile and the errors they make.

Job applicants will have to develop a processing module for the detection of pronunciation errors based on automatic speech recognition and machine learning methods (training models, transfer learning, ...). High technical skills in one or several of the following areas are therefore expected: signal processing, automatic speech recognition (acoustic modeling and acoustic model adaptation), machine learning (including deep learning, attention mechanisms, ...).

The target pronunciation errors are defined by human experts, that is, language teachers of the target language. Such a collaboration is central for our multidisciplinary project. Lexical and syntactic levels will be addressed in a second phase.

Collaboration with other people recruited on the project (engineer, PhD students) as well as with engineers working for the industrial partner of the project are expected, since the goal of ALAIA is to design, develop and integrate software components as web services on the language-learning platform deployed by Archean Labs.



Initial training

- Engineering school or Master's degree in computer science - a first experience in a research environment would be a plus (research internship, PhD).

Expected skills

- **Technical and scientific skills:** solid knowledge in speech processing (esp. ASR, using engines such as Kaldi, HTK or Julius) and/or machine learning (incl. new deep learning techniques).
- **Programming skills:** proven experience in programming languages (Python, C++, shell), knowledge of machine learning toolkits (Sklearn, PyTorch, Tensorflow...) for candidates with a background in ML.
- **Engineering skills:** team working in a multidisciplinary context, good analytical and synthetic skills, ability to rapidly propose, implement and evaluate relevant technical solutions to fulfill the objectives of the project.
- **Writing and organisational skills:** good planning, communication and reporting skills, contribution to scientific papers at international level.

Working conditions

- **Location:** IRIT - 118, route de Narbonne 31062 TOULOUSE, with punctual meetings in Montauban (82000)
- **Duration:** 12 months, with possible extension
- **Salary:** according to background and experience
- **Application deadline:** the position is open until it is filled
- **Earliest starting date:** February 2022

Application

Applications should be sent to isabelle.ferrane@irit.fr and lfontan@archean.tech including:

- a detailed CV
- one or two recommendation letter(s) or contact information
- a one-page cover letter