2018-01038 - Weakly supervised learning for speech recognition

Renewable contract: Oui
Level of qualifications required: PhD or equivalent
Fonction: Post-Doctoral Research Visit

Context

Inria Nancy – Grand Est is seeking a postdoctoral researcher for a new European (H2020 ICT) collaborative project called COMPRISE. The successful candidate will be part of the Multispeech team, which gathers 40 researchers (faculty, postdocs, PhD students) and software engineers in the field of speech and audio processing, with focus on deep learning for speech enhancement and speech/speaker recognition. The team is very international and English is the working language.

COMPRISE is a 3-year Research and Innovation Action (RIA) aiming at new cost-effective, multilingual, privacy-driven voice interaction technology. This will be achieved through research advances in privacy-driven machine learning, personalized training, automatic data labeling, and tighter integration of speech and dialog processing with machine translation. The technology will be based on existing software toolkits (Kaldi speech-to-text, Platon dialog processing, Tilde text-to-speech), as well as new software resulting from these research efforts.

The consortium includes academic and industrial partners in France (Inria, Netfective Technology), Germany (Ascora, Saarland University), Latvia (Tilde), and Spain (Rooter).

Assignment

The postdoctoral researcher will work on the design and the validation of a weakly supervised learning methodology for automatic speech recognition. He/she will address the following research questions:

- how to best exploit automatically labeled speech data for semi-supervised training of acoustic and language models;
- how to exploit domain-specific context information in order to improve the labeling accuracy and the resulting models;
- how to generalize this approach to arbitrary domains.

This research is expected to lead both to publications in top venues and to a practical software demonstrator.

The research and experimentation will be conducted in the Multispeech team at Inria Nancy, in tight collaboration with the natural language processing and dialog team at Saarland University led by Prof. Dietrich Klakow. The successful candidate will have the opportunity to visit Prof. Klakow’s team regularly, in order to benefit from the complementary scientific environments offered by the two teams.

The starting date may be anytime from January 1 to June 1, 2019.

Main activities

- Study existing semi-supervised, active learning methods and their applicability in the context of the project’s architecture and requirements
- Study the properties of label noise incurred by automatic labelling and seek to reduce it by exploiting domain-specific context information
- Design a weakly supervised learning method that leverages these improved labels
- Implement algorithms in a library compliant with the other developments of the consortium
- Contribute to demonstrating their benefit for three specific use cases (smart consumer apps, e-commerce, and e-health).
- Propose guidelines towards generalizing them to arbitrary use cases.
- Coordinate with the two other postdoctoral researchers to be recruited by Inria as part of this project, who will be working on privacy-friendly machine learning and personalized training

Additional activities

- Publish, report, and disseminate results
- Coordinate with related efforts in the team / community

Skills

- PhD in speech and language processing, applied machine learning, or a related field
- Good software engineering and programming skills
- Excellent English writing and speaking skills

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
Remuneration
From 2653.00€ brut per month

General Information
- **Town/city**: Villers-lès-Nancy
- **Inria Center**: CRI Nancy - Grand Est
- **Starting date**: 2019-01-01
- **Duration of contract**: 2 years
- **Deadline to apply**: 2018-10-19

Contacts
- **Inria Team**: MULTISPEECH
- **Recruiter**: Vincent Emmanuel / emmanuel.vincent@inria.fr

About Inria
Inria, the French National Institute for computer science and applied mathematics, promotes “scientific excellence for technology transfer and society”. Graduates from the world’s top universities, Inria's 2,700 employees rise to the challenges of digital sciences. With its open, agile model, Inria is able to explore original approaches with its partners in industry and academia and provide an efficient response to the multidisciplinary and application challenges of the digital transformation. Inria is the source of many innovations that add value and create jobs.

Conditions for application

**Defence Security** :
This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

**Recruitment Policy** :
As part of its diversity policy, all Inria positions are accessible to people with disabilities.

**Warning**: you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.