Normastic
FÉDÉRATION NORMANDE
DE RECHERCHE EN SCIENCES
ET TECHNOLOGIES DE L'INFORMATION
ET DE LA COMMUNICATION

POST DOC POSITION ON SOUND IDENTIFICATION

From: Luc Brun & Olivier Lezoray

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Description of the position

Context: The postdoctoral position is funded under the research project HomeKeeper supported by the French National Future Investments Program. The HomeKeeper project gathers companies and universities around the design of a personal home speaker assistant that communicates with humans through sound media. Within this framework, the personal assistant should be able to discriminate the different persons living in a house and entitled to communicate with it.

Background: Intelligent Home Speakers such as Amazon Echo and Google Home are a causing a wave of excitement amongst consumers. Their shipments reached 5.9 million units globally in 2016 and should grow tenfold by 2022. The promise of conversational, hands-free interaction with the Internet is a very compelling one and the development of personal home speaker assistants is likely to strongly benefit of cutting-edge research developments in speech recognition, especially with the recent advent of Deep Learning techniques. Such advancements in voice biometrics and voice authentication will help ease privacy concerns and make the devices more adaptable to multi-user environments. The Home-Keeper project falls within that line of research and aims at developing an innovative intelligent home speaker connected to a service platform, and will rely on Artificial Intelligence and vocal interaction to ensure secure access to the services.

Objectives and challenges: Several bottlenecks will have to be overpassed in order to perform the speaker identification. The first one will consists in defining a deep learning architecture sufficiently generic for the framework of the application. The second challenge will consists to deal with the reduced number of available data. This problem is particularly challenging in the deep learning context which usually require huge mass of data in order to perform an accurate learning. The insight of the project will be focused on these two points, the second one being hardly addressed by the literature.

Work plan: The position will start by a large state of the art and an encoding of the best non deep methods. This first step should take 3 months and will allow to provide a first result to the other partners of the project.

The second step, evaluated to 6 months will consists in designing a deep learning architecture and to train it in order to identify several members of the project.

The last step, evaluated to 3 month, will consists in designing a first functional prototype and to evaluate its performances (in terms of size of the training set, precision and recall) when a deep network is trained on a new set of persons. This new training will be performed either thanks to random weighs or thanks to the weighs obtained at the previous step. The network architecture will remain unchanged.

Required skills

The candidate must have a recent Ph.D. (within 5 years) in Computer Science (or Applied Mathematics) in the filed of Machine Learning. Knowledge and experience within the Deep Learning frameworks is also very welcomed. The candidate will perform research and algorithmic development and solid programming skills are required. Excellent interpersonal skills and the ability to work well individually or as a member of a project team are recommended. Good written and verbal communication skills are required, the candidate has to be fluent in spoken French or English and written English. Working language can be English or French.

Contacts

Interested candidates should submit their application to

- luc.brun@ensicaen.fr or
- olivier.lezoray@unicaen.fr

Please include in your application email one Curriculum Vitae, one statement of research letter explaining your interest and your skills for this position, and 2 reference letters (all in a single pdf file). Applications will be admitted until the position is filled.

Additional information

Location: Caen, France. Situated in the Normandy region of France close to the sea and about 240km west of Paris; the city still has many old quarters, a population of around 120,000; the city area has roughly 250,000 inhabitants.

Host institution: University of Caen Normandy and CNRS, GREYC laboratory (UMR 6072)

Gross Salary: 2074 € per month (charges included)

Duration: One year, expendable to 18 months

Starting date: from January/February 2018

Advantages: Possibility of French courses, participation in transport costs, possibility of restoration on site.