Ph.D. Project:
Relative Localization in a Radio-Acoustical Virtual Environment

Le génie pour l'industrie

General Information

Research fields: Wireless communications, signal processing, and machine learning
Advisors: Prof. Lokman Sboui <lokman.sboui@etsmtl.ca> and
Prof. Pascal Giard <pascal.giard@etsmtl.ca>
Location: École de technologie supérieure, Montréal, Quebec, Canada
Starting date: Summer 2022 Semester

CRITIAS
NSERC-EERS INDUSTRIAL RESEARCH CHAIR IN IN-EAR TECHNOLOGY

1 Description

We are looking for a PhD candidate with expertise in wireless communications, signal processing and machine learning to work on the implementation of a Radio-Acoustical Virtual Environment (RAVE). RAVE intends to mimic a natural acoustical environment by transmitting speech only to listeners within a specific radius. This radius and direction of transmitter are to be determined using received RF signals in order to deploy a realistic acoustical environment using RF signals. The desired candidate will work on the adaptation an existing third party solution for short-range multicast radiocommunications in harsh electromagnetic interference (EMI) environments and develop a relative localization map using time-of-flight (TOF) between individual radios.

2 Supervision and Funding

Supervision will be provided by Prof. Lokman Sboui and Prof. Pascal Giard. Prof. Sboui is in the systems engineering department of École de technologie supérieure (ÉTS). Professor Sboui's research focuses on design of comunications protocoles, signal processing IoT and wireless communications. Prof. Giard is a professor in the electrical engineering department of ÉTS. Professor Giard's research focuses on the efficient implementation of digital systems, from algorithm design to software and/or hardware implementation. Funding is secured for 4 years (the expected duration of the Ph.D.).

3 Location

École de technologie supérieure is located in Montréal, Québec, Canada. Often described as an appealing blend of North American and European culture, Montréal is a safe, multicultural city, nice to live in, with an affordable cost of living. Since its inception in 2016, Montréal has constantly ranked as Quacquerilli Symonds' Best Student City in North America. Montréal is also recognized for its quality of life. Close to both peaceful rural beauty and exciting ski slopes, this dynamic city offers lively districts and many green spaces. Located in the heart of the city, the ÉTS campus is easily reached by bicycle or public transit.

Since its creation, ÉTS has pursued a mission that is deeply rooted in all its activities: To meet the needs of the industrial sector, which is in need of engineers who have not only a good theoretical background, but also practical knowledge. To fulfil this mission, ÉTS has a unique partnership with the business and industrial spheres that includes both small and large companies. It stands out from other universities in Quebec because of the applied training it offers students, as well as its research activities conducted by and for companies. Furthermore, this position is affiliated with the NSERC-EERS Industrial Research Chair in In-Ear technologies (CRITIAS) located at the Carrefour d'innovation INGO, which offers a unique and intimate relationship with the industrial partner EERS, located just across the hall.

4 Requirements

- Good oral and written communication skills
- Master's degree in electrical and/or computer engineering, or another relevant field
- Proficiency in wireless communications and signal processing
- Experience with machine learning is an asset

5 How to Apply

Interested candidates should send their CV, university transcripts, contact information of suitable references, and a short statement (max. 1 page) describing how their experience is relevant to successfully carrying out this project.