

Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : Yassine Ruichek Given names :

Status (prof., assistant prof., ...): prof

Laboratory : CIAD Laboratory (Distributed Knowledge and Artificial Intelligence) Website address : <https://www.ciad-lab.fr/>

Institution : Université de technologie de Belfort-Montbéliard (UTBM) Website address : <https://www.utbm.fr/>

Scientific competence of the supervisor:

Yassine Ruichek received his Ph.D. in control and computer engineering and his Habilitation à Diriger des Recherches (HDR) in physical sciences from the University of Lille, France, in 1997 and 2005, respectively. Since 2007, he has served as a Full Professor at the University of Technology of Belfort-Montbéliard (France). His research focuses on multisensory data-based perception and localization, encompassing computer vision, pattern recognition, classification, machine learning, and data fusion, with specific applications in intelligent transportation systems and video surveillance.

Two major publications in the field proposed for the PhD :

1. Ferreira, William, et al. "Automatic Spoken-To-Sign Language Translation: A Review of Key Technologies, Limitations, and Interdisciplinary Opportunities." 2025 27th Symposium on Virtual and Augmented Reality (SVR).
2. Stamp, Rose. "Sign language corpora designed for sociolinguistic research: A critical review." International Journal of Corpus Linguistics (2025).

Website address of the personal page : <https://www.researchgate.net/profile/Yassine-Ruichek>

Supervisor's email : yassine.ruichek@utbm.fr

Description of the research work proposed for a PhD Topic # (see list) : I-7, I-12

Title : Linguistic and algorithmic modeling of spoken French to French Sign Language (LSF) translation for digital accessibility.

Subject :

The inclusion of deaf and hard-of-hearing individuals in the digital society requires the development of bidirectional communication interfaces. Currently, the transition from continuous spoken language to a visuo-gestural language (LSF) poses major challenges due to fundamental differences in syntax, spatial grammar, and semantic context. This doctoral project aims to design a sequential processing pipeline allowing the translation of a French audio stream into a signed visual representation, strictly for the purpose of accessibility and inclusion. This PhD thesis will follow a three-part plan, using computer language tools and signal processing: Signal analysis and transcription: Acoustic modeling enabling the conversion of the voice stream into textual character strings, relying on standard statistical models, Linguistics and glosse generation: This is the core of the project. Algorithms based on grammatical rules will analyze French morphosyntax to restructure it into "glosses" (lexical units of LSF), integrating text spatialization constraints, Visual synthesis: The sequences of glosses will drive a generic three-dimensional graphical model, relying exclusively on pre-calculated kinematic animation libraries. Experiments will be conducted on public benchmarks and lexical corpora that are open, free, and completely anonymous, like language and word libraries that anyone can access.

Keywords :

French Sign Language (LSF); signal processing; computational linguistics; digital accessibility; deaf and hard-of-hearing individuals; social inclusion; digital society

Expected collaborations :

UITK (Morocco)
UPV/EHU (Spain)

Background required from the applicant :

- Holder of Master's degree or equivalent in computer science, or related field.
- Advanced knowledge and practice in object-oriented programming (C++, Python).
- Advanced level in English writing and speaking is required.

Existence of a PDF file detailing the proposal ("yes" or "no") : yes
(see guidelines on the website www-csc.utt.fr)