

Marie Skłodowska Curie Action –Postdoctoral Fellowship 2024
(MSCA-PF-2024)

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Department /Institute /Centre	Name	Information Processing Telecommunication Center ETSI de Telecomunicación
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Research Area		Information Science and Engineering (ENG)
Brief description of the Centre/Research Group		https://blogs.upm.es/gthau/ : The Speech Technology and Machine Learning Group (THAU) is part of the Department of Electronic Engineering (IEL), which belongs to the Universidad Politécnica de Madrid (UPM), at Escuela Técnica Superior de Ingenieros de Telecomunicación (ETSIT). Our research activities started in 1978, being our group devoted to research and development in various areas of speech science and technology, including speech synthesis and recognition, speaker diarization and identification, machine translation, conversational systems, and different aids for the handicapped. Inspired by the advances in M/LLMs pre-trained models for combining different modalities and information, our group is also researching with new modalities like using inertial sensor for detecting different health conditions, image, and video processing for sign language recognition and multimodal chatbots; as well as evaluating and generating emotional and common-sense responses or working with NLP techniques for automatic evaluation of dialogue systems.
Project description		Reasoning over texts is an important and very active field that has experienced sustained growth recently thanks to the development of semantic and contextual instruction-aligned vector embeddings, which combined with LLMs architectures, are used to a large extended number of tasks such as RAG-supported generation, Q&A, summarization or ranking. Interestingly, these vector embeddings play an important role in many areas like machine translation, conversational systems, speech recognition or language modeling. In this project we will propose a new architecture and training mechanism in which pragmatic information can be added during the process of training vector embeddings. The proposed project will be part of the activities of the EIC-PATHFINDER funded project ASTOUND in which consciousness and awareness are being developed in chatbots. The project consists of three phases: a) the candidate will explore different architectures for training vector embeddings and the most recent mechanisms for visualization and explainability, b) work on a new mechanism for introducing pragmatic and human-like knowledge during the training or fine-tuning of pre-trained embeddings, and c) compare their objective and subjective performance on different tasks. Finally, the candidate will implement a demo system to be used as a prototype for further commercial and research applications.
Applications: documents to be submitted and deadlines		Applicants must send a detailed curriculum vitae with emphasis in publications and experience on DL/ML techniques, a letter of motivation, at least two reference letters with contact details of the referees, and detailed transcripts for bachelor, master, and PhD. Experience with proposing new DL architectures, training and fine-tuning M/LLMs, dataset creation and annotations, will be considered important plus. Deadline: April 30, 2024.