UNIVERSIDAD POLITÉCNICA DE MADRID

Expression of Interest-UPM Supervisor

Marie Skłodowska Curie Action–Postdoctoral Fellowship 2026 (MSCA-PF-2026)

Supervisor Name	Luis Fernando D'Haro Enríquez
Email	luisfernando.dharo@upm.es
Department /Institute / Centre Name/Location	THAU - Information Processing Telecommunication Center ETSI de Telecomunicación
Research Area	Information Science and Engineering (ENG)
Research team/group	https://blogs.upm.es/gthau/: The Speech Technology and Machine Learning Group (THAU) is a consolidated research group founded in 1978, focused on research and development in speech technologies, including speech recognition and synthesis, speaker diarization and identification, machine translation, conversational systems, and assistive technologies. Current research explores new modalities such as inertial sensors for health condition detection, video processing for sign language recognition, advanced chatbots, emotional and commonsense response generation, and NLP techniques for reasoning and understanding in AI-based dialogue systems. We recently completed the EIC Pathfinder project ASTOUND on incorporating consciousness and theory-of-mind capabilities into conversational agents for cultural heritage applications.
Keywords	Artificial intelligence, intelligent systems, multi agent systems, Cognitive science Human computer interaction and interface, visualization and natural language processing
Research Focus	***Beyond RAG and Vector-based memories for Active Learning*** Large Language Models demonstrate remarkable capabilities in language understanding and reasoning, yet their knowledge remains largely static after training. Current solutions, such as Retrieval-Augmented Generation and vector-based memory systems, extend model capabilities but face fundamental limitations in scalability, knowledge organization, and adaptive learning. Inspired by principles of human cognition, this project proposes to investigate novel memory architectures for LLMs that move beyond factual storage toward structured, contextual, and abstract representations that support reasoning, planning, and continual adaptation. The research will explore how such memory mechanisms can drive active learning and multi-hop reasoning, enabling models to autonomously identify knowledge gaps, acquire new information, and consolidate it over time. By advancing memory-centric foundations for trustworthy and adaptive AI systems, the project aims to contribute high-impact scientific knowledge and open new directions in lifelong and human-aligned artificial intelligence.
Applications: documents to be submitted and deadlines	Applicants should submit a detailed curriculum vitae emphasizing publications and experience in machine learning, a letter of motivation, at least two reference letters including contact details of the referees, and complete academic transcripts for bachelor's, master's, and PhD degrees. Experience in designing and implementing new AI architectures, training and fine-tuning machine learning models and large language models, and dataset creation and annotation will be considered a strong plus. Deadline to submit these documents to supervisor is **April 30, 2026**.