THE INSTITUTE OF INTELLIGENT SYSTEMS AND ROBOTICS*
JOB OFFER

Fixed-term contract IT engineer

Context: The Greta platform allows controlling the multimodal behaviour of an Embodied Conversational Agent ECA in real time. The platform is modular but with a linear structure which does not allow it to take into account frequent phenomena during an interaction such as interruptions, socio-emotional reactions of interlocutors, or adaptation mechanisms. It cannot take advantage of the incremental structure of the acoustic and visual signal processing modules and of the dialogue modules. Therefore, we aim to transform the modular structure of the Greta platform into an incremental architecture by modifying its main modules (planning of intentions, behaviours and their realisation).

The Greta platform is developed at the ISIR laboratory, Sorbonne University. This new platform is the basis for the ISIR federative project "avatar of the future" which aims at modelling the interactive loop between a human and an ECA by recurrent neural networks. Different levels of adaptation must be taken into account to obtain this interactive loop. It is necessary that the virtual agent has the capacity to adapt to all levels in real time. This new platform will also be used in our various national and European research projects. The Greta platform is on GitHub with the GPL license.

Missions: The candidate will be involved in the restructuring of the architecture and the code of the Embodied Conversational Agent system. This restructuring concerns the renewal of two specific modules for the planning and realisation of multimodal behaviours. The intention planning module will be based on an incremental dialogue model. Such an architecture also relies on the incremental structure of the acoustic and visual signal processing modules.

It is also necessary to develop an incremental behaviour generation model allowing the agent to update its behaviours. The Greta virtual agent behaviour planner will then be able to incrementally compute the agent's multimodal behaviours. This task requires modifying the behaviour planner module so that it no longer calculates the agent's behaviour at the level of the complete sentence but at the level of the 'chunk', a piece of sentence generally consisting of a word surrounded by function words. This requires to redesign the planning of behaviours and of their synchronisation.

At the level of the behaviour realizer module, particular attention will be paid to the interaction between verbal and non-verbal production which involve sequential and simultaneous management of signals of different modalities, as well as coarticulation between them.

Skills required:
- System knowledge and experience: Windows
- Programming knowledge and experience: Software engineering, multi-threading, software interoperability
- Programming languages mastered: Java (advanced level), C#, C++, Python
- Experience with a real-time 3D rendering engine: OpenGL, OGRE, Unity3D, Unreal Engine
- Experience with code versioning tools: Git, SVN
- Experience in modelling: human-agent interaction platform, dialogue model, etc.

General information:

- Workplace: PARIS
- Type of contract: Fixed-term contract for IT engineer
- Duration of the contract: 12 months
- Expected date of employment: 1 May 2021
- Working hours: Full time
- Remuneration: between 2100 € and 3000 € gross per month depending on experience
- Desired level of education: Engineer
- Desired experience: 1 to 4 years

Contact:

Applications can be made through the CNRS job portal:
https://emploi.cnrs.fr/Gestion/Offre/Default.aspx?Ref=UMR7222-CATPEL-001

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*The Institute of Intelligent Systems and Robotics (Isir) is a Joint Research Unit (UMR7222) under the supervision of Sorbonne University, The French National Centre for Scientific Research (CNRS) and Inserm (ERL-U1150). This multidisciplinary research laboratory brings together researchers and teacher-researchers from different disciplines of Engineering and Information Sciences as well as Life Sciences.