



**Offer #2020-02981**

## **The role of rapport in human-conversational agent interaction: Modeling conversation to improve task performance in human-agent Interaction**

**Contract type :** Fixed-term contract

**Renewable contract :** Yes

**Level of qualifications required :** Graduate degree or equivalent

**Fonction :** Temporary scientific engineer

### **Context**

The objective of this project is to build embodied conversational agents (also known as ECAs, or virtual humans, chatbots, or multimodal dialogue systems) that have the ability to engage their users using language and nonverbal behavior, both social and task talk, where the social talk serves to improve task performance. In order to achieve this objective, we model human-human conversation, and integrate the models into ECAs, and then evaluate their performance.

The engineer chosen for this project will work with a strong multidisciplinary team of doctoral students, postdocs, and other researchers, to develop a state of the art Embodied Conversational Agent system that can engage with people. It will be demonstrated on a large screen at Inria (and perhaps in other venues), and also used for human-computer interaction experiments on the web and on mobile devices.

Inria offers a supportive environment for engineers, as they are located in a particular research group, but also benefit from the support of the entire group of engineers at Inria Paris who carry out research and development.

### **Assignment**

- The engineer chosen for this project should have a broad range of skills at the intersection of Dialogue Systems, Cognitive Architectures, Embodied Conversational Agents, and Animated Agents. These skills should include several of the following:
- Implementing modules for speech recognition, intention recognition, dialogue management, and natural language generation.
- Interfacing the dialogue system modules with competence modules such as intelligent tutors or recommendation systems.
- Working with architectures that include nonverbal behavior recognition as well as speech recognition, and with architectures that include an animated agent implemented in Unity for nonverbal behavior generation.
- Integrating results from deep reinforcement learning on natural language and nonverbal behavior corpora into the dialogue system pipeline.
- Exploring the utility of different genres of architectures, such as Cognitive Architectures, with short- and long-term memory, and user models.
- Developing and maintaining a multi-user version of the Embodied Conversational Agent that can run in a browser.
- Developing and maintaining a multi-user version of the Embodied Conversational Agent that can run on a smart phone.
- For more information on the project, potential candidates should look at the SARA (Socially-Aware Robot Assistant) website at <<http://articulab.hcii.cs.cmu.edu/projects/sara/>> and read some of the publications associated with the project, here <<http://articulab.hcii.cs.cmu.edu/publications/>>

### **Skills**

**Technical Skills:** Solid competence in deep learning applied to dialogue systems, advanced competence in programming in language such as Python and C++, and use of tools such as Tensorflow and Pytorch.

**Languages:** French, English

**Relational Skills:** ability to work in a team, and collaborate with others from different disciplines and backgrounds. Ability to manage other team members.

### **Benefits package**

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training

## Remuneration

Salary will be based on experience and will follow the Inria salary scales.

The position is planned for a total of 3 years, but the contract will be signed for renewable periods of one year.

## General Information

- **Theme/Domain** : Language, Speech and Audio  
Software engineering (BAP E)
- **Town/city** : Paris
- **Inria Center** : [Centre Inria de Paris](#)
- **Starting date** : 2021-01-01
- **Duration of contract** : 12 months
- **Deadline to apply** : 2021-09-30

## Contacts

- **Inria Team** : [COML](#)
- **Recruiter** :  
Cassell Justine / [justine.cassell@inria.fr](mailto:justine.cassell@inria.fr)

## About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

## The keys to success

The successful candidate should have a passion for cutting edge and interdisciplinary research at the nexus of AI and Social Sciences, the desire and ability to work as part of a diverse team, and to manage interns and other more junior group members.

**Warning** : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

## Instruction to apply

### Defence Security :

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

### Recruitment Policy :

As part of its diversity policy, all Inria positions are accessible to people with disabilities.