Social Signal Processing of small teams' behaviors in a Virtual Reality environment

Description

An intern position is now available at "Laboratoire Traitement et Communication de l'Information", Télécom Paris, Institut polytechnique de Paris, France (https://www.telecom-paris.fr/fr/recherche/laboratoires/laboratoire-traitement-et-communication-de-linformation-ltci)

Supervisors

Prof Giovanna Varni
PhD Candidate Lucien Maman

Keywords

Social Signal Processing, Information Technology, Multimodal Data Analysis, Machine learning, Deep learning, Computer vision.

Framework

The internship will focus on the development of computational approaches to study cohesion among the members of a small team acting in a VR-environment. How cohesion can manifest and develop and can be modeled in VR- settings are some of the research questions that will be addressed.

This work will be conducted in the framework of the 3-years long ANR JCJC French national project GRACE (Groups' Analysis for automated Cohesion Estimation) started on April 2019. For more information on the project, have a look on our website: https://grace.wp.imt.fr/

Recently, with the advent of Social Signal Processing aiming at developing socially intelligent machines [1], Computer Science research took interest in investigating and quantifying relational phenomena involving two or more persons. Groups of people are a fascinating interdisciplinary phenomenon. They can be defined as bounded and structured entities that emerge from the purposive, interdependent actions of individuals.

One of the current open challenges on automated groups' analysis is to provide computational models of higher-level concepts called "emergent states", that is, states emerging as the result of affective, behavioral and cognitive interaction among the members of a group [2]. Cohesion is one of these states considered as a highly valued group property serving crucial roles for group effectiveness and performance.

Scholars proposed theoretical models of cohesion having from one to five dimensions [3]. Among these dimensions, the task and social ones were the most investigated. The task dimension concerns the extent to which group members are united to achieve the group's goals and objectives ; the social dimension refers to the social relationships within the group (e.g. the extent to which group members like each other.

Virtual Reality applications can be used to teach and improve social skills, suggesting that interactions in a virtual environment share similarities with the real-world environment. At present, however, only a few studies compared interactions in both VR and real-world settings (e.g., [4]). Understanding how cohesion manifests in both virtual and real environments would enrich our comprehension of cohesion, leading to the development of more robust multimodal systems.

Role

This is an exciting opportunity for you if you are interested in engineering and/or research. We have many directions to explore. Some tasks are more practical than the other and we will discuss your interests to find the best fit.
The intern's tasks include but are not limited to:
1) Reviewing literature on small teams acting in eXtended Reality, more specifically in Virtual Reality
2) Computing multimodal behavioral features of cohesion from a new multimodal (audio and motion capture) challenging dataset
3) Data analysis
2) Working on a computational model of cohesion.

Candidate profile

The ideal candidate should have a strong background on Computer Science, AI, Information Technology, Applied Mathematics or closely related fields. In addition to a passion for science and programming, the candidate should be open to approach and solve the issues linked to Human-Computer Interaction.

The following skills are also expected:
- Good command of English (written and spoken). French language is not a mandatory requirement
- Interest in multidisciplinary research at the interface between Computer Science and Sociology/Psychology
- Proof of Excellent student career
- Strong programming skills (e.g. C++/Python)
- Very good communication skills, commitment, independent working style as well as initiative and team spirit.

Offer

Starting date: as soon as possible.

Salary

Full-time intern fellowship according to the Telecom Paris salary scale.

Application deadline

The evaluation of the candidates starts immediately and it will continue until the position is filled.

Application

To apply please send by email to giovanna.varni@telecom-paris.fr and lucien.maman@telecom-paris.fr in a single pdf file:
- A cover letter stating your research interests and how they could be related to the research topic the internship focuses on.
- A detailed CV
- Transcripts of student records of your last year.

For any additional questions about the position, please contact Prof. Giovanna Varni and Lucien Maman. Please quote “Intern_position_SocialSignalProcessing_and_VR” in the email subject for both asking information and application.

References

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[3] Salas, E., Grossman, R., Hughes, A. M., and Coultas, C. W., 2015. Measuring team cohesion: Observations from the science. Human Factors, 57, 3, pp. 365-374.

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