Interaction & Social Brain

Workshop ILCB 2019

Research axes of the workshop

Axe 1: Methodological approaches to analyze the interactions: human-human, animal-animal, human-artificial agents

Axe 2: Convergence and imitation

Axe 3: Social brain

Methodological approaches to analyze the interactions: human-human, animal-animal, human-artificial agents

- Analyse of particular phenomena in *human-human interaction*
  - Collect of data:
    - semi-controlled interaction
    - high-controlled interaction
  - Annotation of the data:
    - verbal and non-verbal signals
    - manual and semi-automatic annotation
    - control of the quality
  - Analyse corpora
    - Manual analysis
    - Automatic analysis (machine learning methods)
- Expertise and tools to analyse human-human interaction, how to adapt to other types of interaction
  - Human-virtual agent : same methods to analyse human-artificial agents that the methods used for human-human interaction
  - And for animal-animal ?

The Social Brain

Human-Human versus Human-Robot interaction & communication; joint-action

Comparative approach to communication

Longitudinal brain imaging in non-human primates; Effect of group size; Gesture vs. Vocal;

Language, speech processing

Implicit social cues influence the interpretation of intonation

Social neurons: A new perspective on the social brain?

Birgit Rauchbauer, Thierry Chaminade, Adrien Meguerditchian, Nicolas Claidière, Marie Montant, Noel Nguyen, Pascal Belin, Giusy Cirillo, James Sneed German, Kep Kee Loh, Ana Zappa, Clémentine Bodin, Lydia DOROKHOVA, Arnaud Rey, Florence Gaunet, Driss Boussaoud, Mireille Bonnard …

Animal-animal interactions

Apply the linguistic tools of multimodal interaction coding to non-human primates (baboons):

Homologies of discourse, turn-taking and "syntax" in baboons?

What is an informative gestural (facial/postural/vocal) unit in NH primates?

Role of the recipient feedback in the interpretation (semantics?) of a gestural sequence

Need to desambiguate notions used in the fields of animal communication and linguistics (minimal acceptable common definitions)

Interactions with artificial agents

Artificial agents used as **experimental platform** to test hypothesis (because not always possible to simulate particular phenomena with humans/actors, e.g. incongruent behavior)

Different projects that **emerged from ILCB**

- Project AMIDEX : human-robot interaction in an fRMI setup, robot used as a control condition to compare to human-human interaction (INT, LPL, LIS)
- Projet Brain-IHM : comparison of the EEG activities during the perception of congruent versus incongruent feedbacks behaviors in human-virtual agent interaction and human-human interaction (LIS, LNC, LPL, ISM)
- PhD Giusy Cirillo (LPL, UPF Barcelone) : use talking head robot to simulate convergence phenomena
- Project to analyze the perception of multimodal feedbacks using artificial agents (LPL)

Problematic:

- We use the artificial agent to test the perception of incongruent behavior
- Pb : we are not sure that incongruent behavior are perceived as incongruent for virtual agent : the incongruency of artificial agents may be perceived as "bugs" -> incongruent behavior of the virtual agent is normal ?

Convergence and imitation

Neural bases of social facilitation, from the interlocutor's mere presence to human-human and human-machine interactions

Cross-disciplinary approaches to assessing convergence, from large-scale corpus studies to joint-action experimental studies

Designing computational models of feedback using white-box, machine-learning techniques and implementing these models in artificial agents

Role of interlocutor in the perception and understanding of speaker's speech by the audience

Perspectives

- To explore the conversational approaches used for human-human interaction to analyse animal-animal interaction: similar problematics (e.g. analyse of gestures) -> tutorial on methodologies (e.g. to analyze feedbacks, convergence) ?
- Impact of social presence on the task realization : same effect with the presence of artificial agent ? Social brain during human-machine interaction
- Impact of the interlocutor on the perception of the locutor
- Analyse of the convergence within conversation with a large corpus based approach
- Language of sounds : representation of this particular type of language, e.g. the semiotic of non-verbal sounds ?
- The discovery of social neurons within ILCB promotes research towards a new perspective on the social brain
- *Technological lock* : the tuning of artificial agents (e.g. recognition, prosody)
- Organize a 1-day workshop on "Social Brain". Aim: brainstorm on how to bring together members of ILCB working on the differents aspects of "social" processes in relation with social presence and social interactions