



**HAL**  
open science

# Dynamical Systems to Account for Turn-Taking in Spoken Interactions

Mathieu Jégou, Pierre Chevaillier, Pierre de Loor

► **To cite this version:**

Mathieu Jégou, Pierre Chevaillier, Pierre de Loor. Dynamical Systems to Account for Turn-Taking in Spoken Interactions. *Intelligent Virtual Agents 2014*, 2014, Boston, United States. *Intelligent Virtual Agents 2014*, 2014. ⟨hal-01522859⟩

**HAL Id: hal-01522859**

**<https://hal.science/hal-01522859v1>**

Submitted on 15 May 2017

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

# Dynamical Systems to Account for Turn-Taking in Spoken Interaction

Mathieu Jégou / Pierre Chevallier – Lab-STICC/b<>com, France

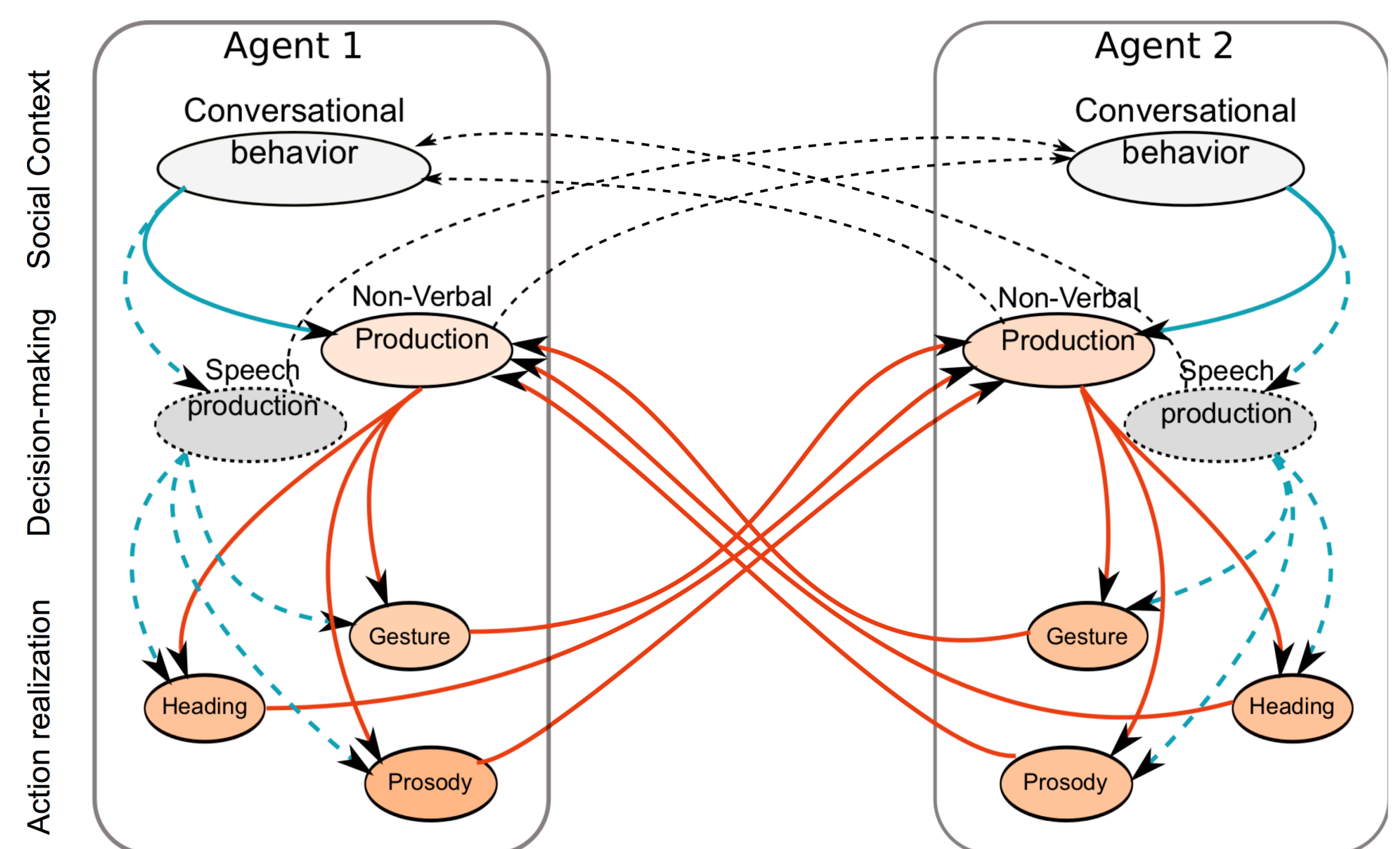
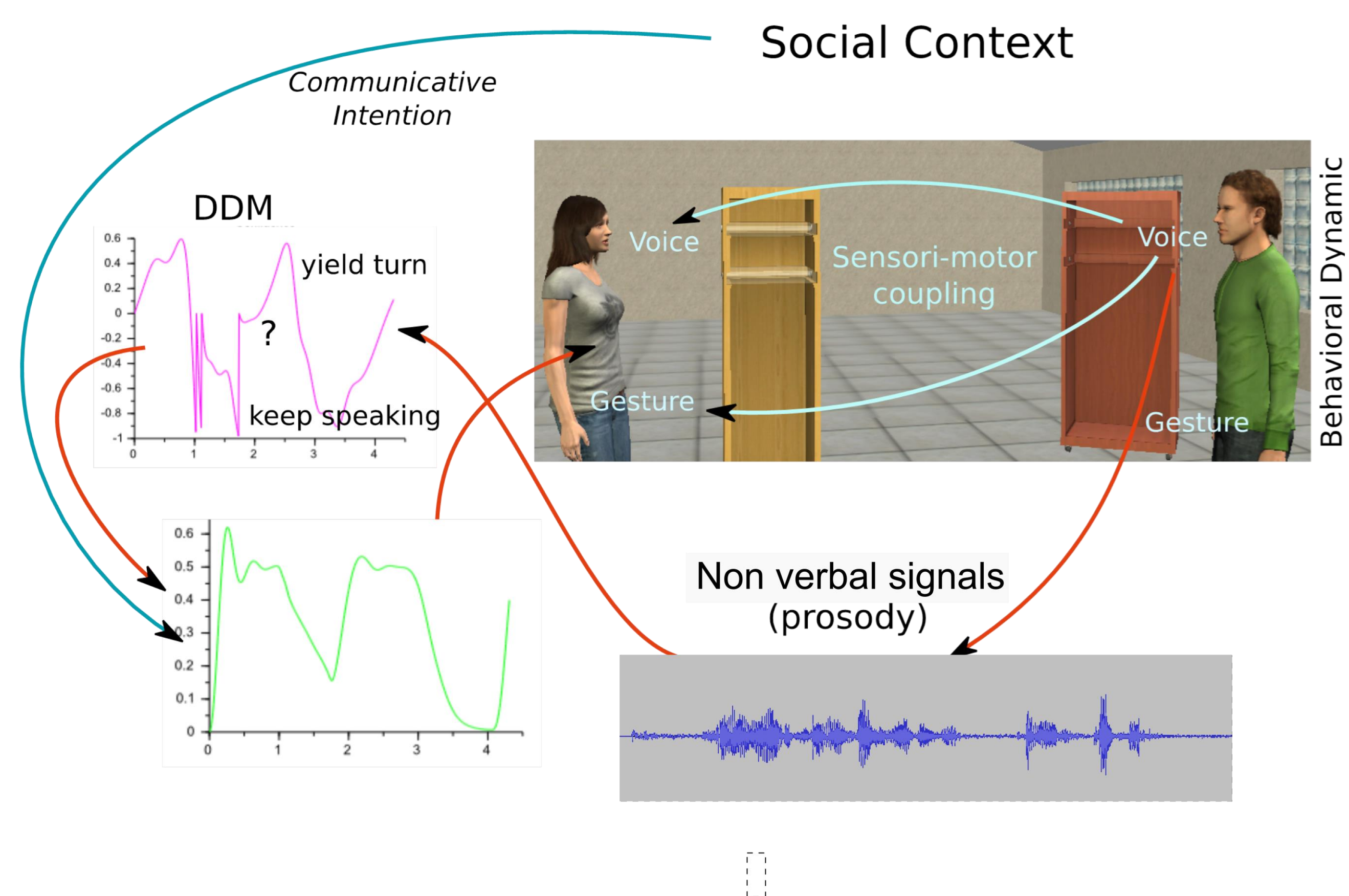
Pierre De Loor – Lab-STICC, France

## Goals:

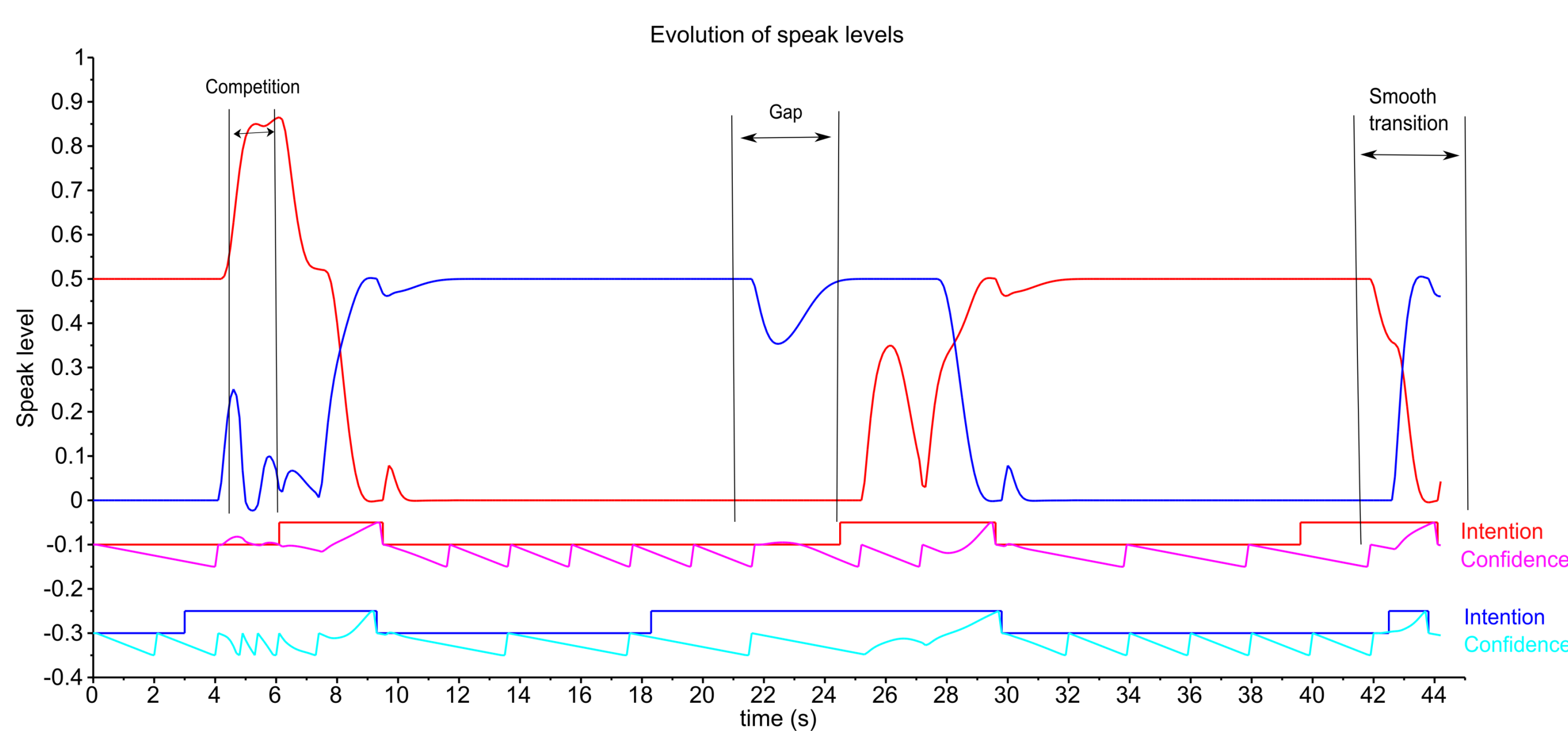
- **Continuous, multimodal non-verbal** interaction with user
- **Sensori-motor coupling** between user and agent
- Application to **turn-taking management** : realistic turn-transitions

## Criteria of success:

- **Emergent** and **self-organized** patterns of turn-transition between agents
- Consistent **interpretation** of user's **multimodal signals**
- **Production of multimodal, non verbal signals**, the right way, the right time



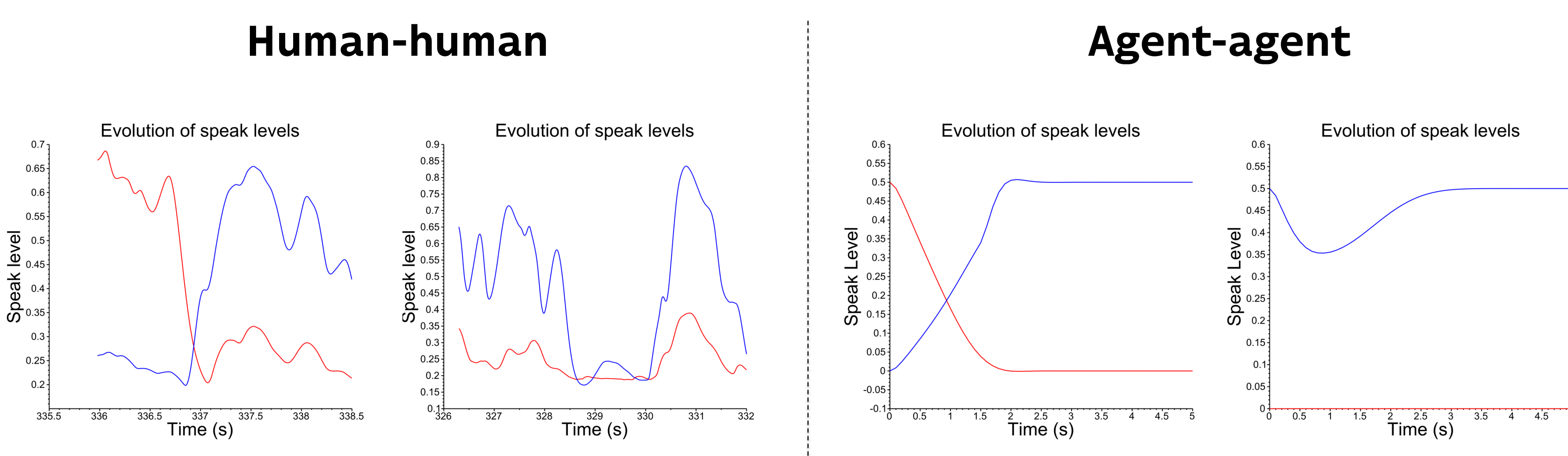
## Agent-agent simulation



### Main results

**3 main patterns :**  
**gap, smooth transition, competition**  
**Self-organized transitions without prediction**

## Validation



### Improving the model

**Temporal calibration**  
**Gaps not marked enough**

## Next steps

- Main qualitative patterns of human-human interactions
- Realistic responses to real humans curves
- Real-time interactions between virtual human and user

## References

1. Sacks, H., Schegloff, E.A., Jefferson, G.A.: A simplest systematics for the organisation of turn-taking in conversation. *Language* 50, 696-735 (1974)
2. Warren, W.H.: The dynamics of perception and action. *Psychological Review* 113(2), 358-389 (2006)
3. Ratcliff, R.: A theory of memory retrieval. *Psychological Review* 85, 59-109 (1978).

**Acknowledgments :** This work was supported in part by a grant from the National Research Agency (ANR) (Corvette project Anr-10-Cord-012) and by the Institute of Research & Technology b<>com, dedicated to digital technologies. It has been funded by the French government through the ANR Investment referenced ANR-A0-AIRT-07.