



Toward Modeling Commensal Interactions in Human Dyads

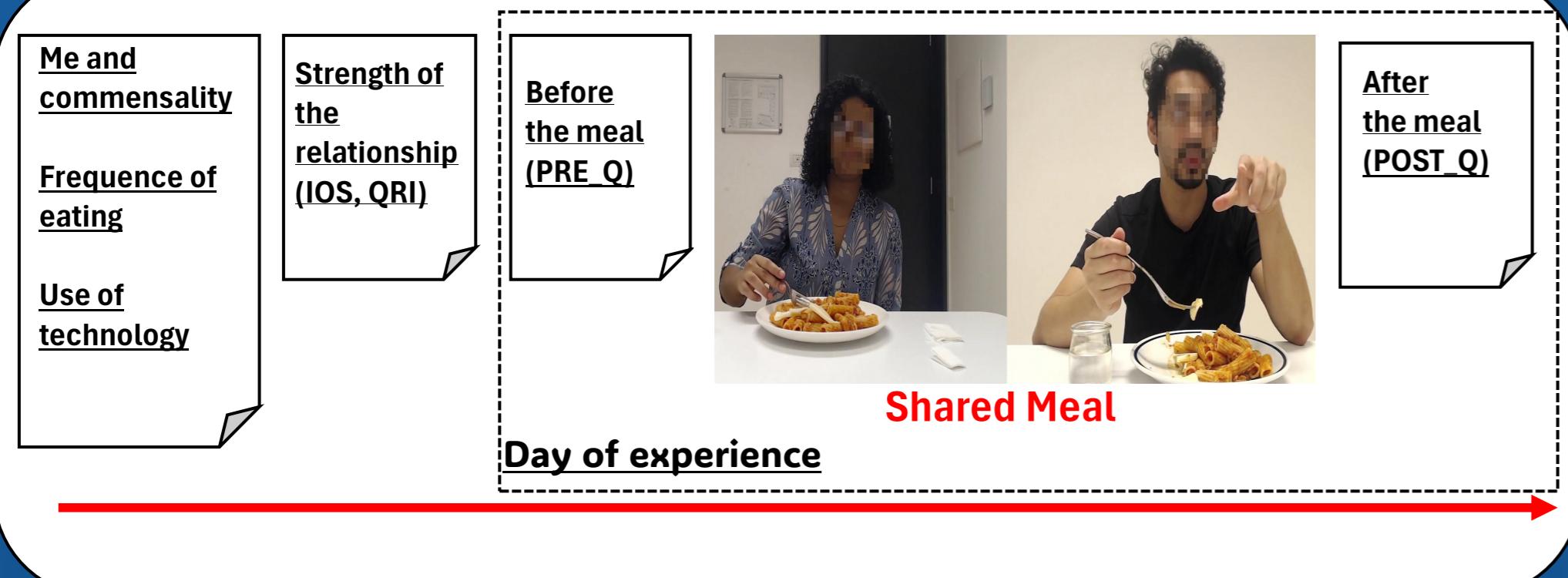
Modeling Interactions

- Social interaction modeling uses **nonverbal cues** like posture and gaze to reveal social dynamics.
- Past research has focused on structured meetings and mingling, analyzing, e.g., engagement and leadership.
- Social dynamics in **commensal settings** remain underexplored, despite strong HCI interest in dining experiences:
 - Eating and sharing food: a core social act with **unique dynamics**
 - Commensal interactions: require **tailored models**

First study that:

- Aims to quantify **commensal interactions** in eating dyads.
- Focuses on detecting specific nonverbal behaviors.
- Measures synchronization of commensal activities in dyads:
 - Social behavior: smiles
 - Food consumption-related behavior: food intake
- Correlates findings with self-reported strength of social relationship.

Dataset

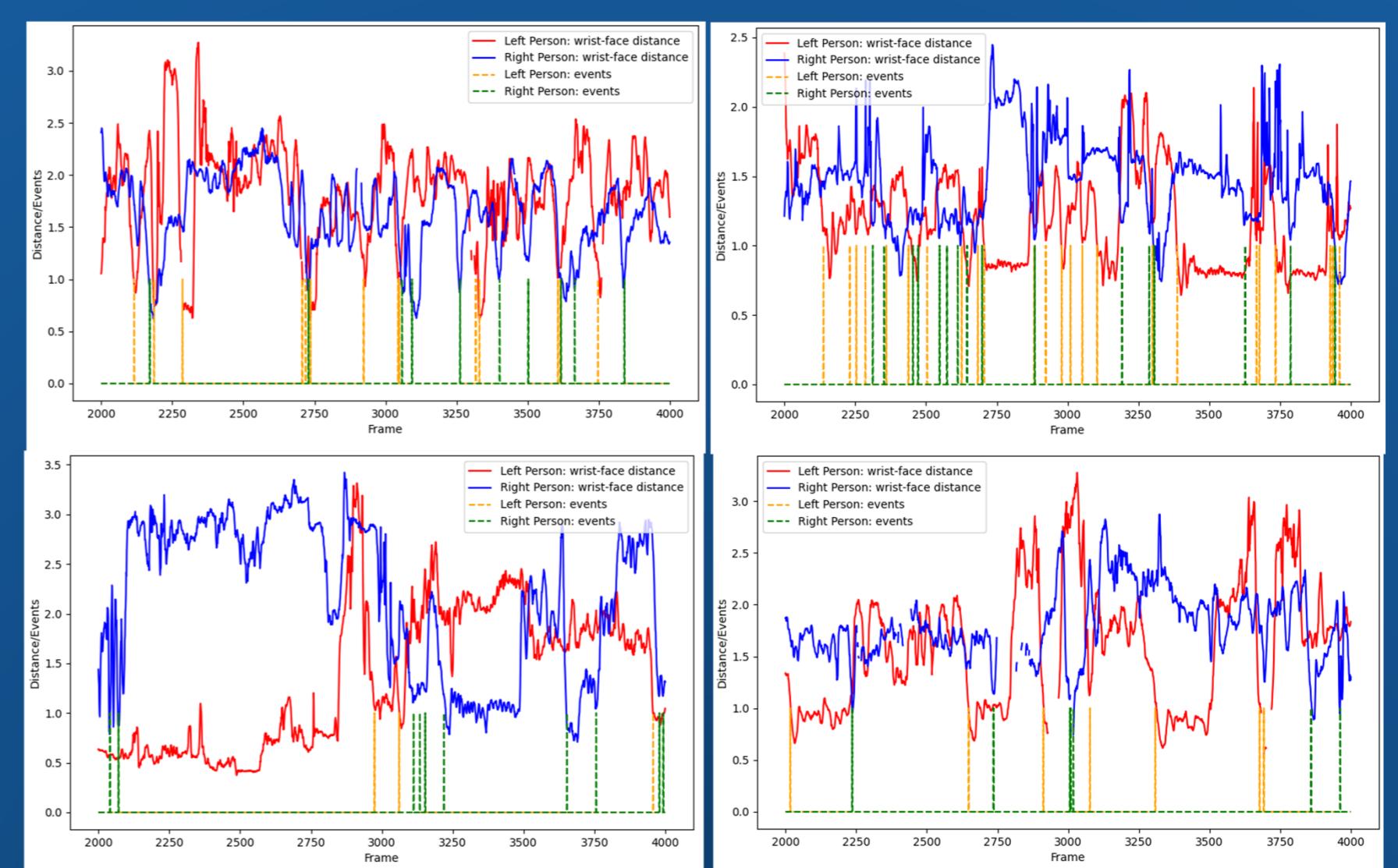


- 12 sessions featuring pairs with varying levels of acquaintance, eating similar food
- 234 minutes of video
- Each session includes synchronized, dual-camera views of participants facing each other
- Participants completed questionnaires measuring:
 - Willingness to share meals in general
 - Frequency of shared meals
 - Strength of the relationship**
 - Attitude toward the partner before and after eating

Methodology

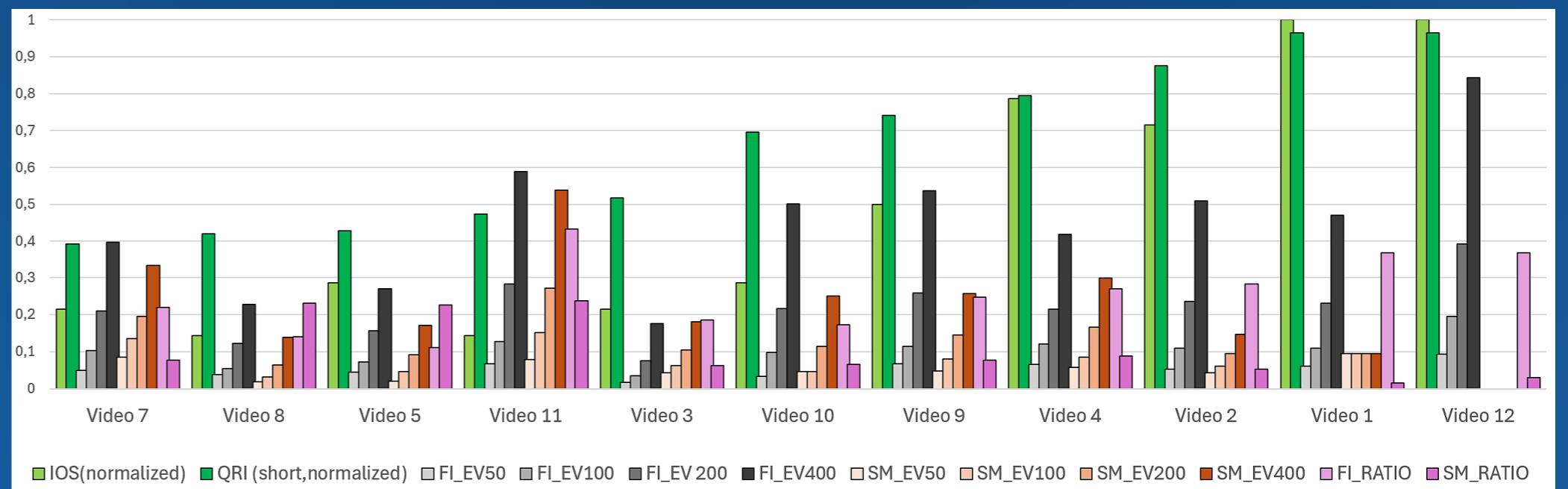
- Food intake** and **smile events** were detected using *MediaPipe* and *OpenFace*
- Event synchronization** algorithm (Quiroga et al. 2002) used to assess coordination between eaters
- Synchronization levels** correlated with self-reported relationship strength

Results



The top row shows two examples of wrist-to-hand distances for strongly connected dyads. The bottom row shows the same for low-acquaintance pairs.

- Dyads reporting a strong relationship showed:
 - More synchronized food intake
 - Fewer smiles and lower smile synchronization
- All participants reported high satisfaction with the experience (avg. score: 6.1/7)
 - 9 reported a more positive attitude toward their partner after eating; 6 reported a decrease
 - 12 believed their partner's attitude had improved; 4 believed it had worsened



Synchronization results vs. questionnaire responses: green shades show questionnaire answers; gray, food intake sync; brown, smile sync.

Applications

- Artificial Commensal Companions



- Technology for well-being interventions:
 - health, e.g., regulating eating pace and mindful eating
 - social, e.g., enhancing group inclusion

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