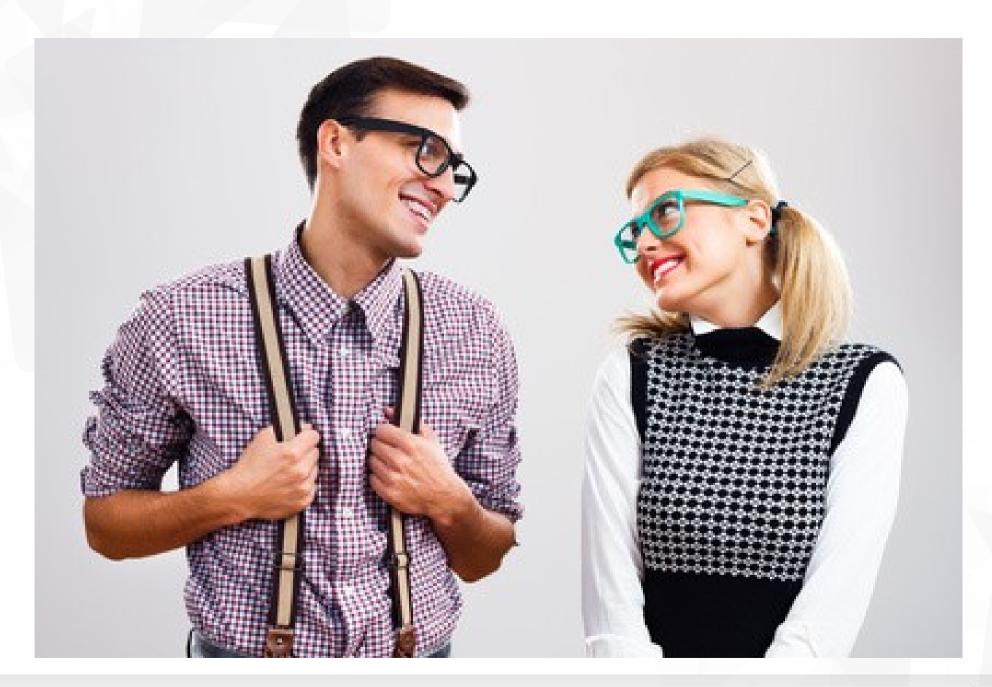
: Modeling Group Dynamics in Complex Conversational Scenes from Non-Verbal Behaviour

Hayley Hung Delft Technology Fellow Pattern Recognition & Computer Vision Lab











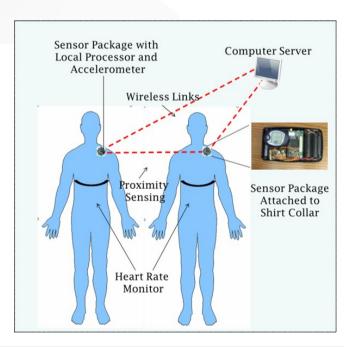








Teams face Isolated, Confined, and Extreme Conditions

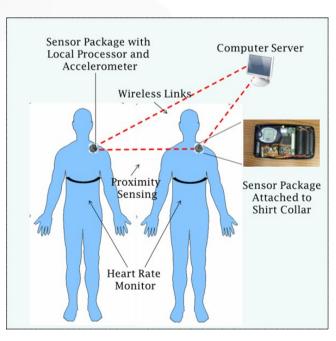


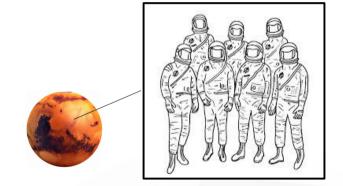






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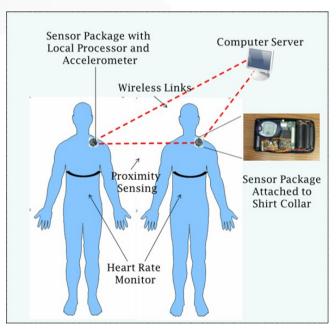








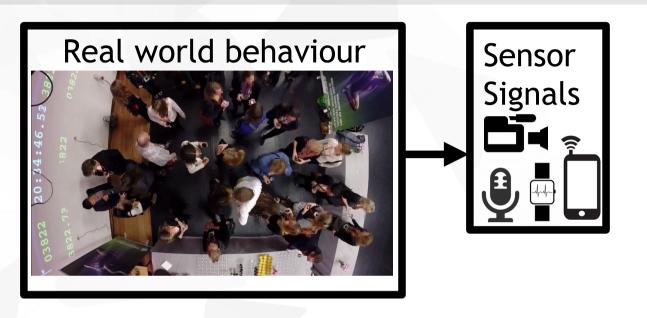
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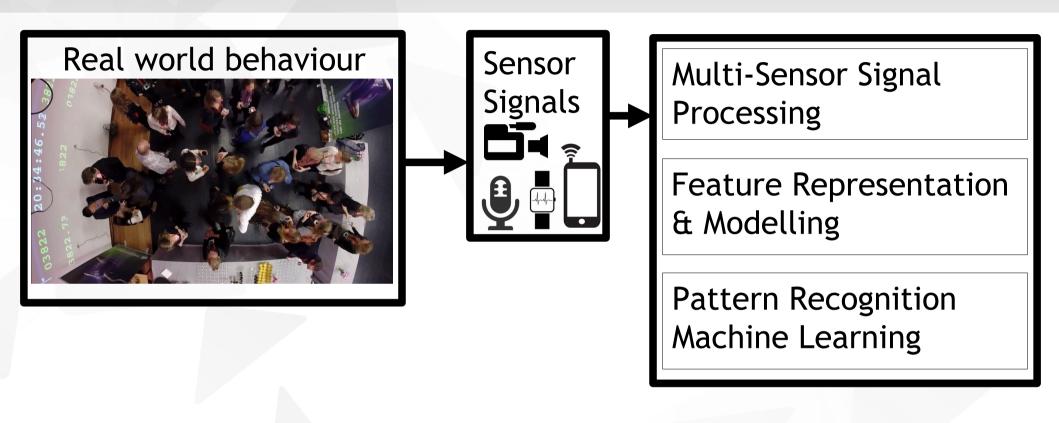


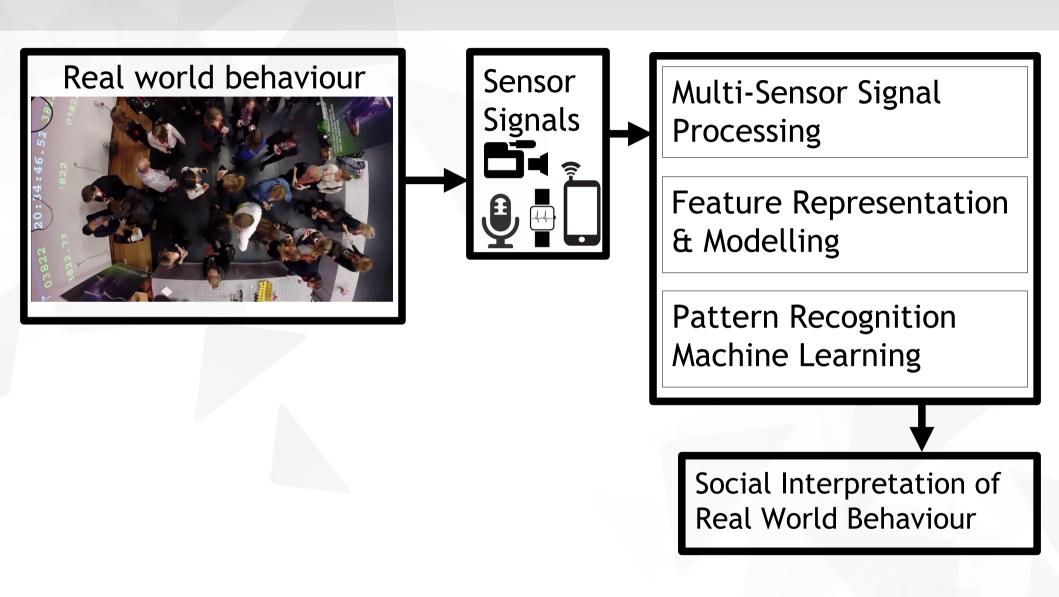


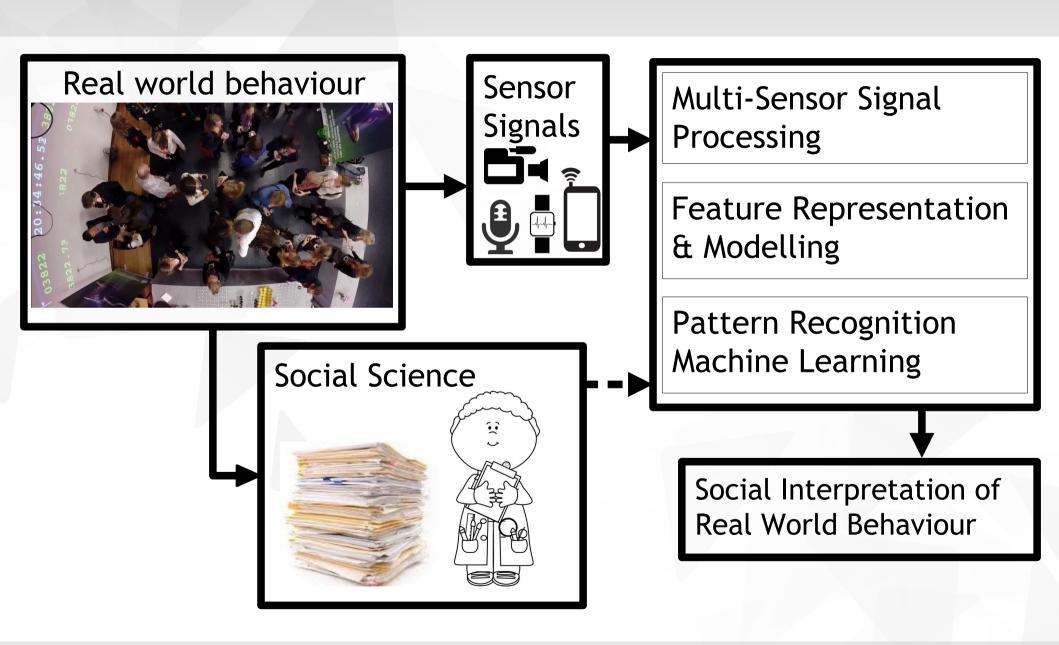
Long-Distance Intervention Ineffective







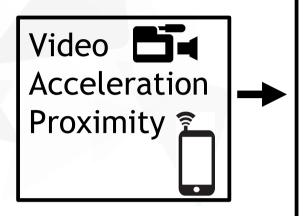




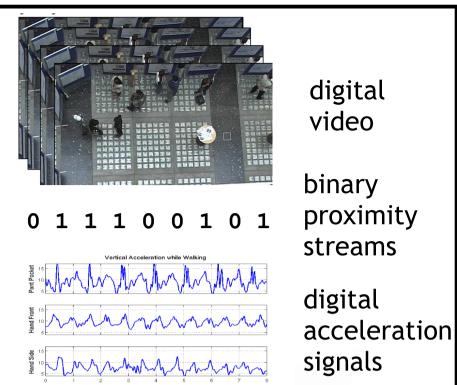
The Key Research Question of Children

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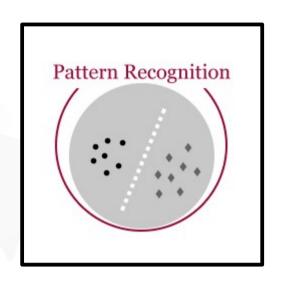
How can
Sensor Processing and
Statistical Learning Methods
be developed to Model the Dynamics of
Complex Conversational Scenes
with only Non-Verbal Behaviour?



How can
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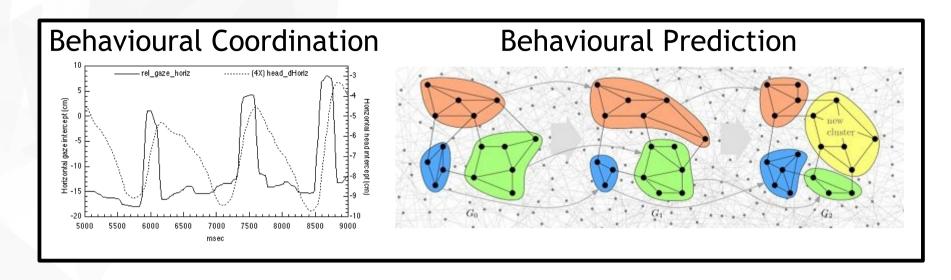


How can Sensor Processing and Statistical Learning Methods

Behavioural Coordination

Behavioural Prediction

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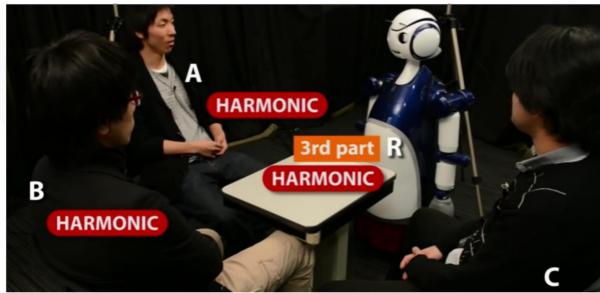
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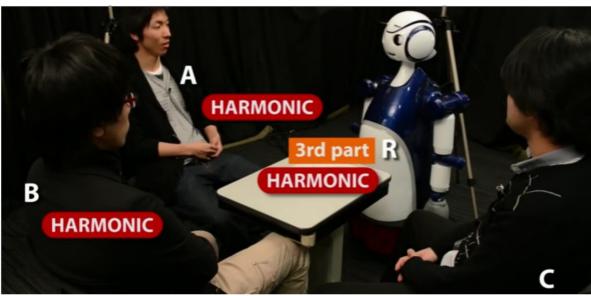


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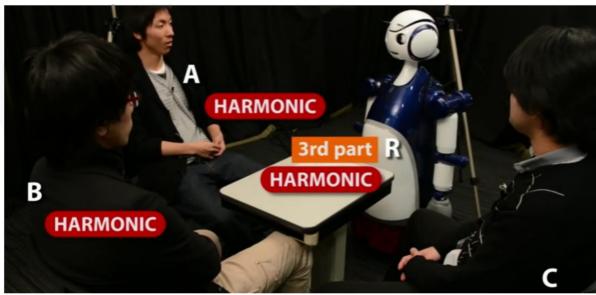






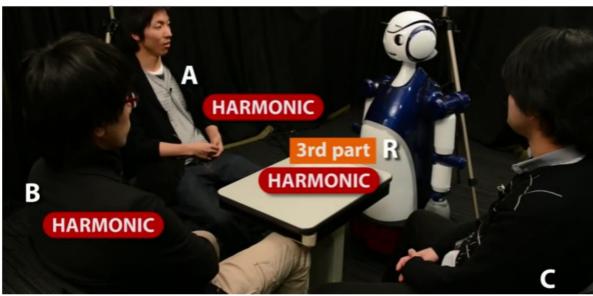
Pre-arranged conversation





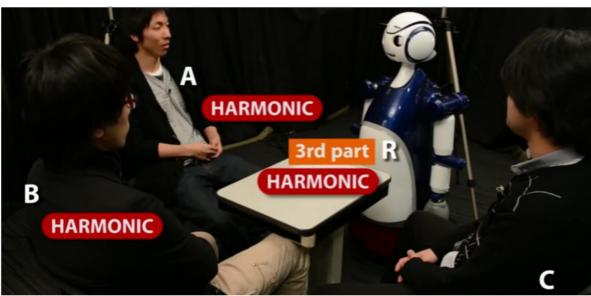
- Pre-arranged conversation
- Single conversation





- Pre-arranged conversation
- Single conversation
- Clean sensor data





- Pre-arranged conversation
- Single conversation
- Clean sensor data
- Rich social science understanding

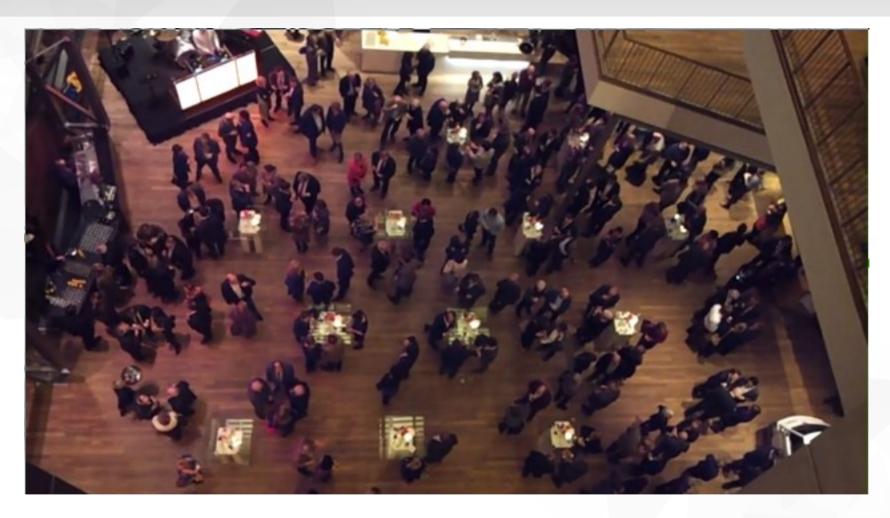
The Challenge of Complex Conversational Scenes



- Clean sensor data
- Single conversation
- Rich social science understanding
- Pre-arranged conversation

Challenges and Innovations in





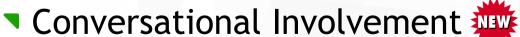
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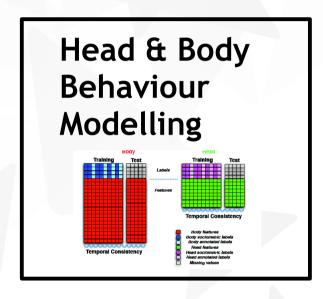


Social science incomplete ?

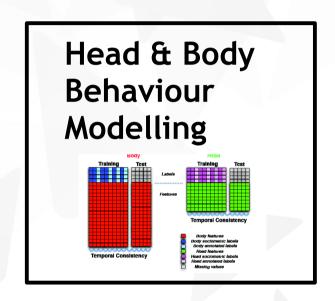


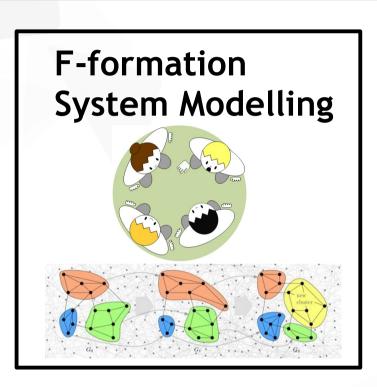
Research Themes

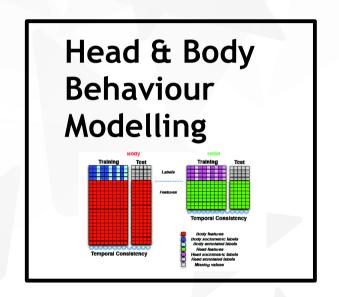
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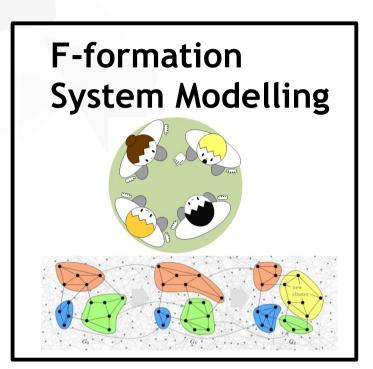


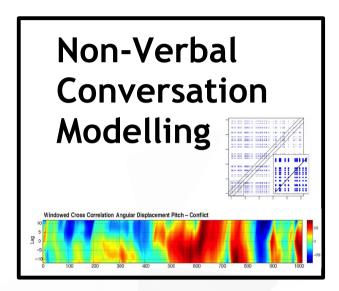
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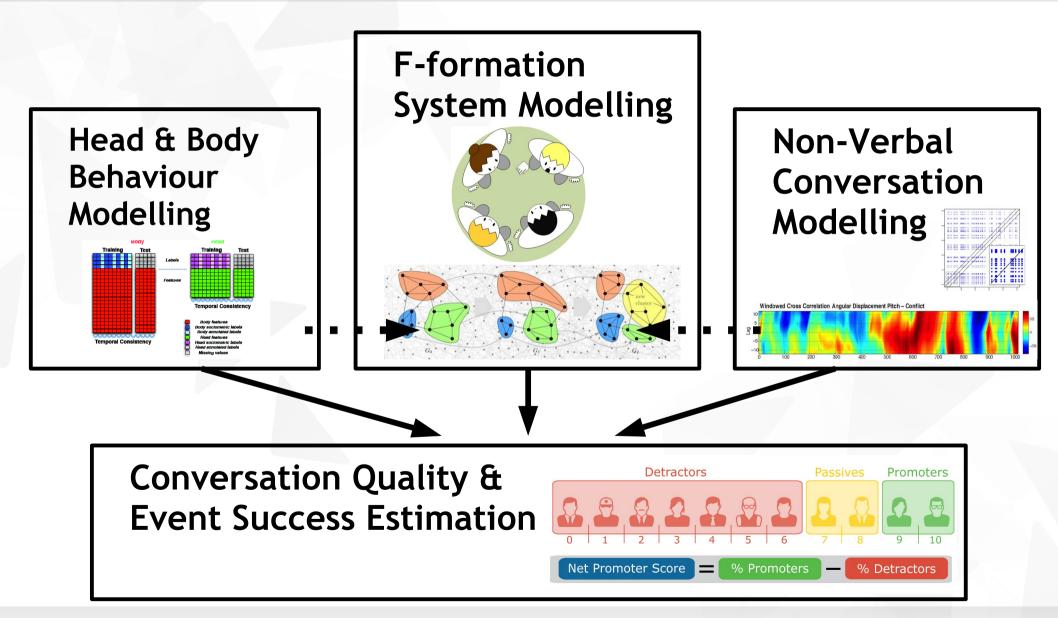


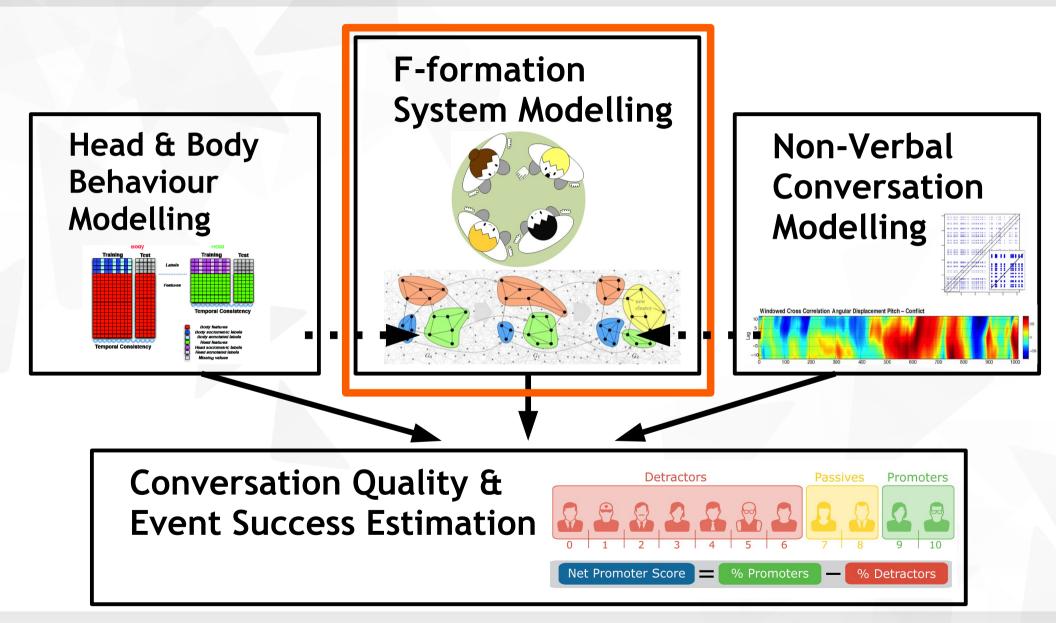


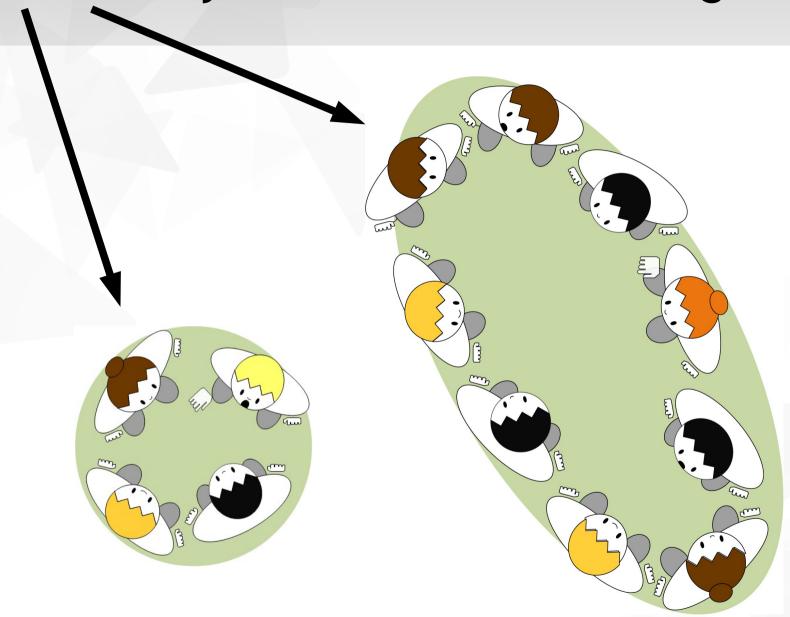


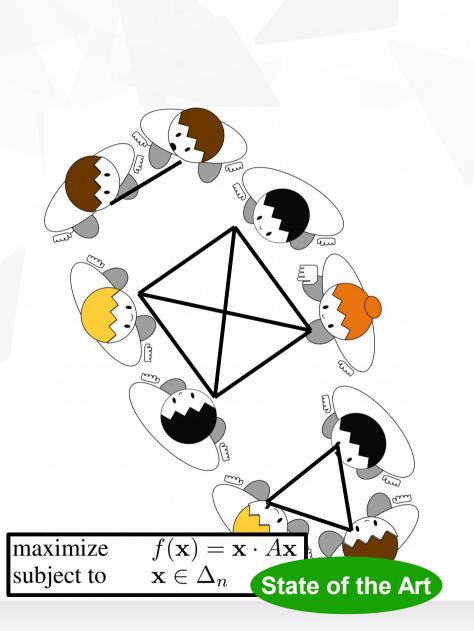




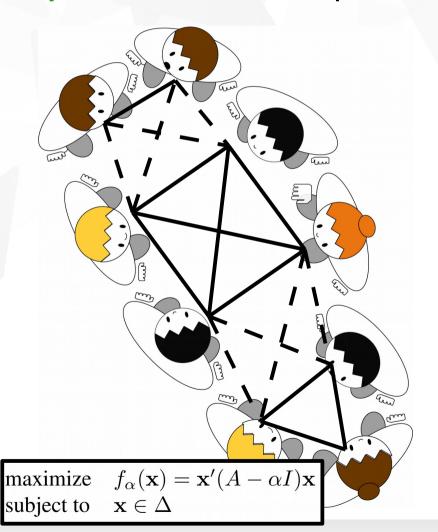




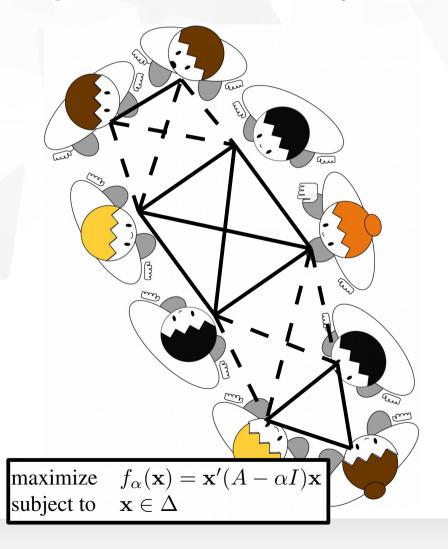




■ Graph Layer 1: Spatial conversation potential

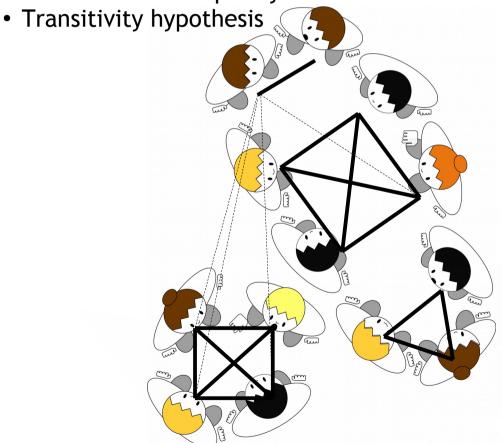


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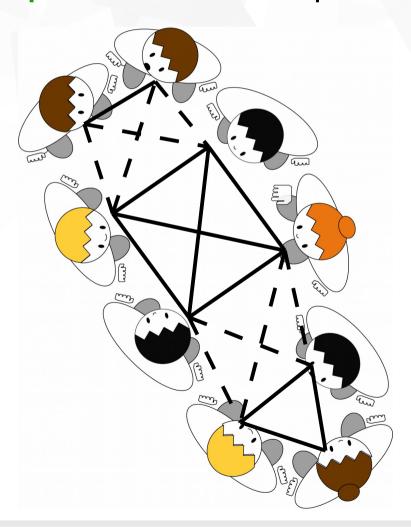


- Graph Layer 2: Relational conversation potential
- Dynamic Model

Prior interaction quality

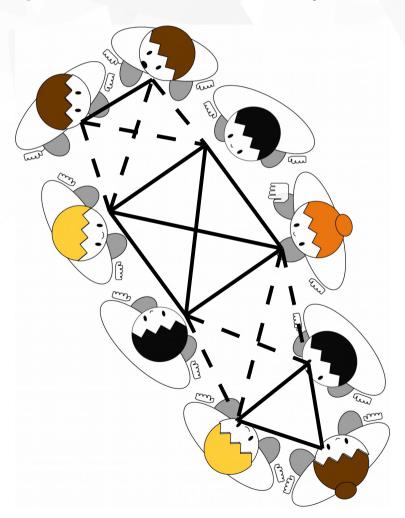


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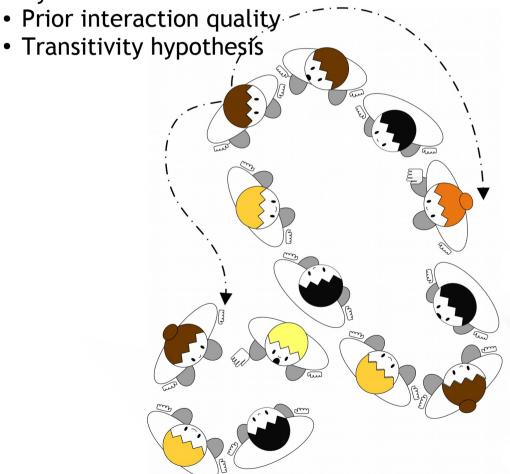


- Graph Layer 2: Relational conversation potential
- Dynamic Model
- Prior interaction quality
- Transitivity hypothesis

■ Graph Layer 1: Spatial conversation potential



- Graph Layer 2: Relational conversation potential
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 - Unique background:
 - PhD in Computer vision,
 - ▼ Postdoc in Multi-sensor social signal processing
 - Collaboration with social science
 - Actively increasing impact of SSP in the CS community

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Existing in group:
Speed Dating Data
100 subjects

TUDelft

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 - Diverse international experts and leaders in their own fields



External Academic **Impact**

Computer Science:

Smart Environments Human Robot Interaction Virtual Agent Modeling

Social Science:

Group Research Organizational Psychology Social Psychology



External Academic Impact

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Prof. Steve Kozlowski

User Committee





IBM Benelux Center for Advanced Studies





Dr. Andries Stam, Senior Researcher, Almende





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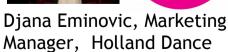




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mew insights for the automated analysis of social behaviour



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Head & Body Behaviour Modelling

- Orientation estimation
- Conversation and Floor Schism detection

F-formation System Modelling

- **■** Stability prediction
- ▼ Evolution modelling

Non-Verbal Conversation Analysis

- **▼** Event detection
- **▼** Stability & quality
- estimation

Conversation Quality & Event Success Estimation

- Personal multi-conversation history
- Net promoter score prediction