Memory Aware Conversational AI to aid virtual Team-Meetings: multimodal memory corpus collection

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Abstract

Motivation
Current conversational AI is limited in what it remembers of a user across sessions. We want to collect a corpus of virtual team meetings to develop a memory aware conversational AI that can leverage information from previous meetings to increase team cohesion in future sessions.

Aim
In this humane-AI micro-project, we propose investigating human recollection of team meetings and how conversational AI could use this information to create better team cohesion in virtual settings.

Team meeting
3 participants and 1 moderator will discuss COVID-19 policies of the past year with a goal of coming up with better rules fitting various stakeholders. The hired moderator will be leading the discussion to touch upon value-related topics. For a more interesting discussion, each participant will be from a different demographic (e.g. elderly person, a student, a parent, a business owner)

Research questions

1. What intervals of a meeting do participants remember?
   How are these intervals related to participants'
   a. values
   b. emotion
   c. personality
   d. relationship to fellow teammates
   e. goal and social role in the meeting
2. How can we computationally model and automatically identify these memory-relevant intervals in a meeting? How are: (a) **turn-taking**, (b) **eye-gaze**, (c) **theme/rheme**, (d) **prosodic hotspots** related to these memory-relevant intervals, and can they aid the prediction?
3. How do participant's impressions of one-another evolve over time, and how are they related to memory-relevant intervals in time?
4. Would modelling a conversational AI after the moderator increase its perception of social presence and team cohesion?

Annotation
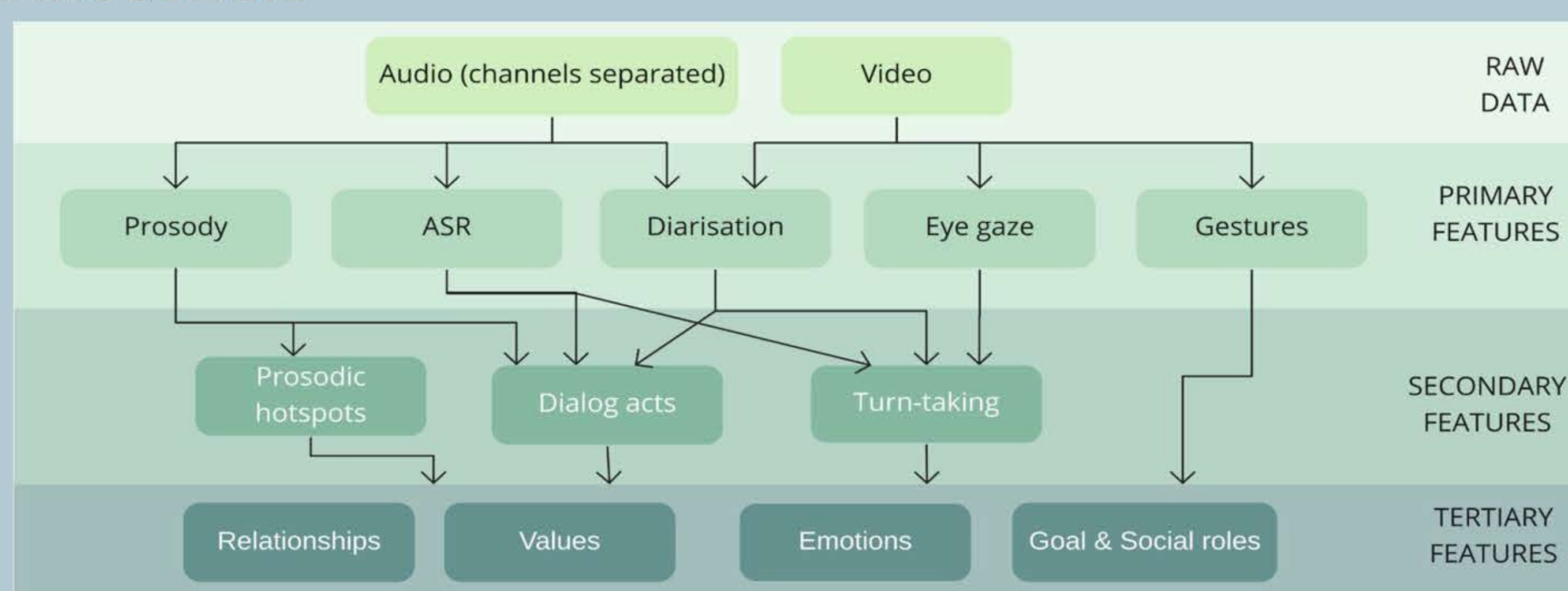
Memory: free recall & timeframe specification

Free recall (both long-term and short-term):

"Describe everything you remember from the past session"

But: the answers are not specific enough to refer them to particular memorised intervals

Solution: after all the post-questionnaires after each session, participants have to rewatch some moments from the recorded conversation and rate how well they remember them and tag the moments they mentioned in their free recall report

Disadvantage: resulting memory bias. Therefore 2 conditions: one does the additional memory check, the other one doesn't.

Procedure

Size: ~202 hours (90 participant groups *three 45 minute sessions each)

- Each session: 3 participants (prolific) + 1 trained moderator
- Every participant from different demographic => different values and stakes (more to discuss)
- 3 sessions for each group, spaced in time (3-4 days between sessions)
- 3 conditions by topic: COVID-19/ global warming/ pollution

Task:
Rethink the past year with COVID-19/ global warming/ pollution and come up with a policy that fits all the stakeholders' needs
Why?
- Different stakes depending on demographic (elderly, young, parent, business owners)
- A possibility of heated discussion
- A common goal

Questionnaires:

completed both by participants and the moderator, testing:

1) Memory: free recall, short-term & long-term
2) Perception of conversation, moderator & other participants
3) Personal: age, gender, personality, values

Planning

When released: till the end of 2021, after publication

HumaneAI microproject	start	end	7/21	8/21	9/21
Experimental set-up	**01/07/21**	**12/07/21**			
Recruiting & training moderators	01/07	09/07	Recruitin		
Questionnaire set-up	01/07	09/07	Question		
Trial video	12/07	12/07	I		
Data collection	**01/07/21**	**27/08/21**			
Ethical approval	01/07	09/07	Ethical a		
Prolific: recruiting participants	12/07	16/07	Prolific		
Grouping and scheduling	19/07	23/07	Groupi		
Data collection	26/07	27/08	Data collection		
Annotation	**05/07/21**	**27/08/21**			
Pre-processing for annotation	05/07	06/08	Pre-processing for annotation		
Final feature extraction	02/08	27/08		Final feature extraction	
Publication & analysis	**30/08/21**	**15/09/21**			
Corpus publication	30/08	15/09			Corpus publicatio
Memory model	30/08	15/09			Memory model
AI meeting moderator	30/08	15/09			AI meeting moder

Acknowledgements

Overall experiment set-up