

# METALOGUE

Multiperspective Multimodal Dialogue:  
dialogue system with metacognitive abilities

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# METALOGUE overview

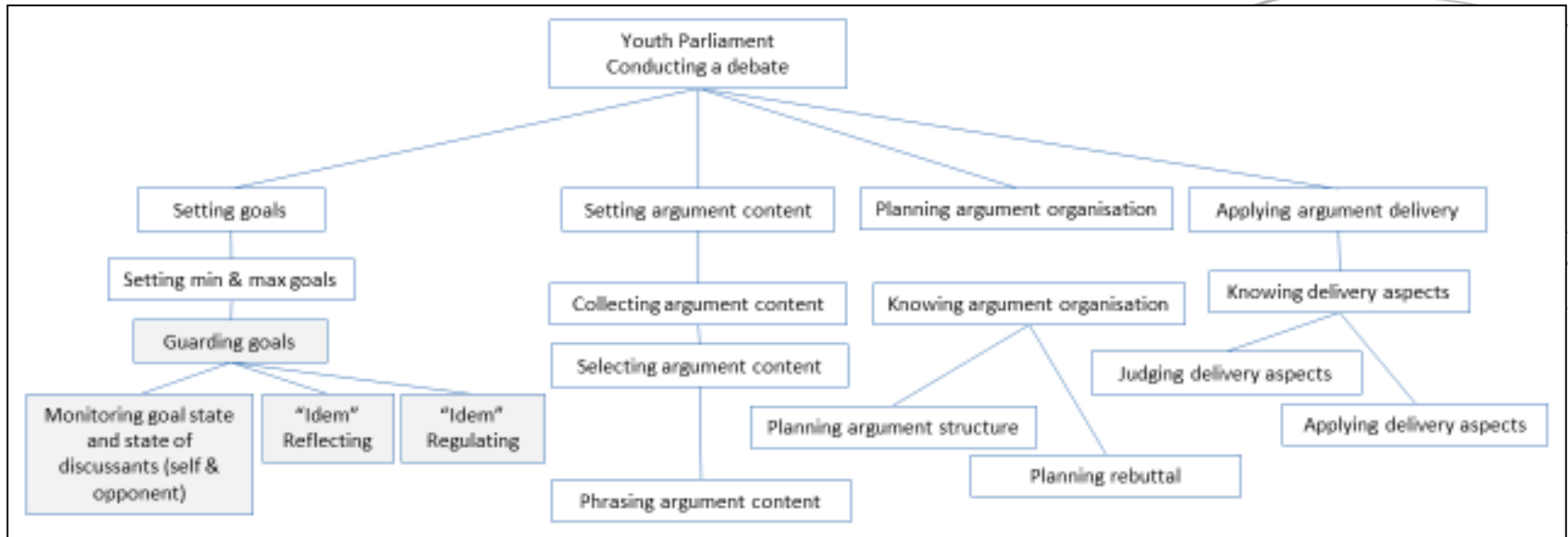
- EU FP7-ICT project [www.metalogue.eu](http://www.metalogue.eu) : November 2013 – October 2016
- 10 academic & industry partners from German (DFKI coordinator), NL, Greece, Ireland & UK
- The goal is to design and develop a multi-modal dialogue system that is able to implement interactive behaviour that seems natural to users and is flexible enough to exploit the full potential of multimodal interaction
- Focus on educational & coaching applications where negotiation skills play a key role
- Two use cases: Hellenic Youth Parliamentarians debating skills, call centre agents interaction skills
- Natural interaction: in English, Greek or German using gestures and/or body language



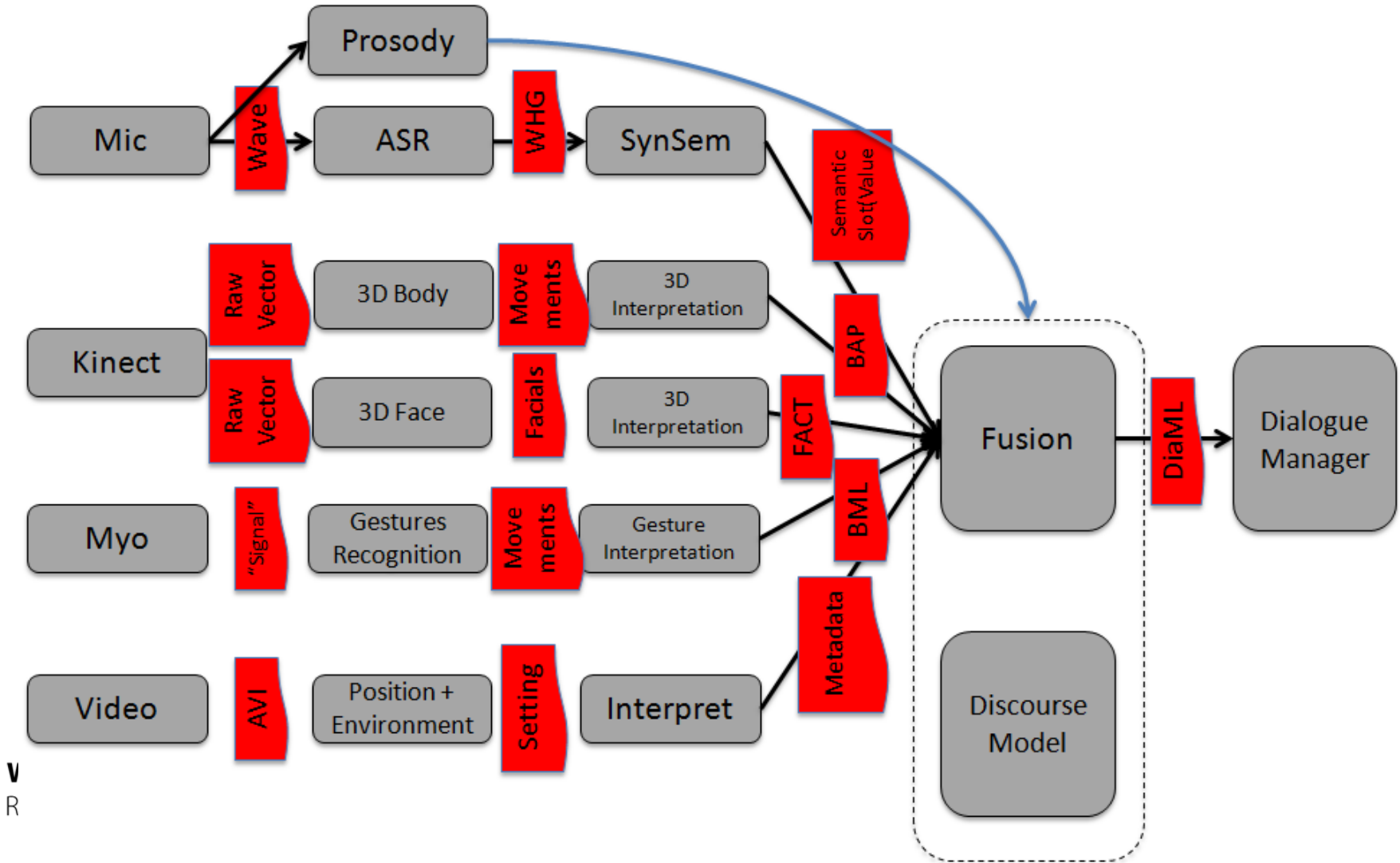
# METALOGUE use case 'Hellenic Youth Parliament'

Giving an interactive presentation is a complex task:

- content aspects (e.g. what to present, how to structure it, rebuttal, .....
- voice aspects (i.e. how to control and use your voice)
- body language aspects (i.e. how to control and use your body)
- be aware of the effects of arguments, voice and body language (i.e. continuously, monitor, reflect and adapt)



# METALOGUE Processing workflow and formats of data



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# METALOGUE Educational Design

**Instructional Design** based on 4C-ID model (Van Merriënboer & Kirschner, 2013) which aims at teaching complex skills. Four components:

- Authentic Learning tasks, Supportive information, Procedural information and Part-task practice

## Feedback:

- About what (low level close to the sensors and/or high level close to the skills and aspects of proposer and opponent)
- Timing (immediate or afterwards)
- How to judge (criteria, norms, rubrics, ...)



# METALOGUE Instructional Design

Task complexity	Level 1	Level 2	Level 3
	Simple e.g. present yourself and discuss your interest (to get to know the system) or a position statement with one exchange	Full topic. Limited number of arguments or argument exchanges	Full topic. Number of arguments or argument exchanges depend on the participants
Focus	Voice volume	.....	+ content organisation

- **Task 1a** (demonstration). Observe an expert debate video with comments.
- **Task 1b** (imitation). Observe and assess a video of a debate.
- **Task 1c** (completion). Present and debate "ban smoking" (readings given)
- **Task 1d** .....



# Feedback: Immediate or Afterwards

Immediate feedback should be (Hattie & Timperley, 2007; Engeser & Rheinberg 2008; Coninx, Kreijns & Jochems, 2013):

- *specific and goal oriented*, i.e. focus on key aspects so that the learners become aware (and in combination with the about-action feedback comprehends their meaning and use them accordingly);
- *clear* i.e. not ambiguous so no interpretation problems
- *concise* i.e. short so as little disruptive as possible;
- *predictable* i.e. the type of feedback should be known/agreed upon in advance



# Feedback Structure & Timing

1. *Goals.* Status of the debate goal to be achieved & learning to debate as a goal
2. *Content and organisation.* Arguments, evidence, structure, rebuttal
3. *Delivery.* Specific & and integrative perspective of how the speaker speaks
4. *Emotion.* Awareness of the emotional state of the participants.
5. *Voice.* Aligned with in-action
6. *Movements.* Aligned with in-action
7. *Gap.* Personal moments of struggle, angst or uncertainty or success

In action

About action

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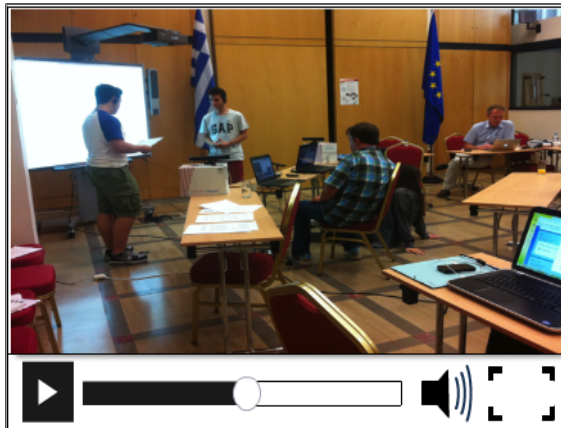
# Examples of Available Aspects Analysis

## Voice, Body or Dialogue act

Dialogue act use ('speaker's intentions')		Indicators/ definition/examples
Social obligation acts	Use indirect speech acts for politeness purposes	Suggest instead of Request or Instruct; Use Indirect requests instead of direct request Use Check questions instead of Informs
	Use social conventions	Apologize for misunderstandings, errors; Thank for offers, for answering questions, for good debate Greet in the beginning Farewell at closing the debate Stay friendly
Task (and Task Management)	Provide evidence	Use figures, statistics, personal experience



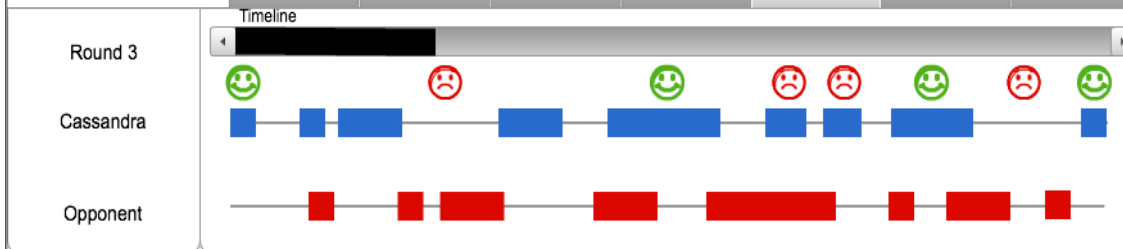
# Example: METALOGUE Feedback



## Appropriate Speech Rate

Your speech rate was 4 syllables per second - which is in line with the average for a range of competent speakers. See link: <http://sixminutes.dlugan.com/speaking-rate/>

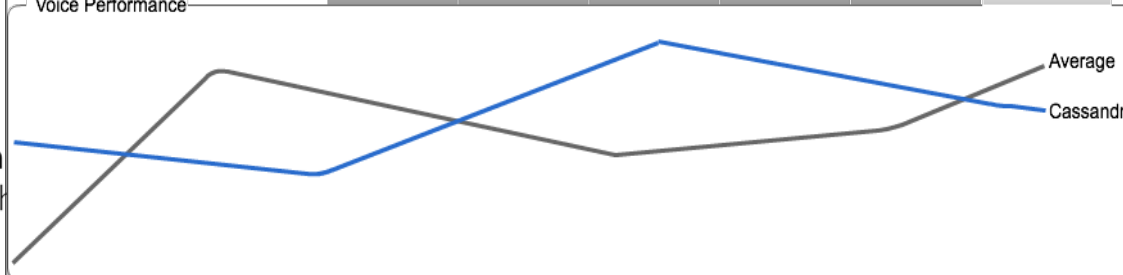
Goals Content Delivery Emotion Voice Movement Gap



**Metalogue Feedback Icon:**  
Mouse-over to see details in top right box. Click to locate corresponding video segment (top left box)

**Utterance Bar:** Click to locate corresponding segment in video (top left box)

Voice Performance Pauses Emphasis Volume Tone Speech Rate Overall



# Hands-on: Sensors in Education

- Topic:** Public speaking.
- Design:** Design sensors based feedback on one or more aspects of public speaking
- Procedure:** Take 15 minutes to go through the questions in pairs or triples and discuss & design sensor-based feedback

Part 1:

- Q1 The aspect.
- Q2 Assessing the aspect as a human assessor

Part 2.

- Q3 Suitable sensors
- Q4 Assessing the aspect with sensors



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# Discussion - Questions

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For more info: [www.metalogue.eu](http://www.metalogue.eu)

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