

# Paris Workshop Short Presentation Proposal: Emergent Model of Emotion

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## 1 Existing Emotion Models

Computational models of emotion are useful in a variety of domains such as for development of believable agents, video games, virtual environments, etc. Most of the existing models are inspired by appraisal theory and focus on an agent's cognitive behavior, for which they often generate emotions according to static rules or pre-determined domain knowledge. The OCC taxonomy [4] is one of the most used models and remains a key reference for the development of applications in particular in the domain of Embodied Conversational Characters. Numerous implementations were seen, for example the Affective Reasoner [3], VICTEC [6], etc. Another famous model of appraisal under development is [7]. While these models function at a high-cognitive level, models like [5, 1] function at a low-neurophysiological level.

## 2 An Emergent Emotion Model

A conversational agent that is capable of responding to events with the appropriate expression of emotions requires a flexible emotion model that incorporate various factors such as motivational states, planning and cognition. An interesting model that might be useful is the 'PSI' [2] model of emotion. The 'PSI' theory of psychologist Dietrich Dörner provides a framework for agents focusing on emotional modulation of perception, action-selection, planning and memory access, uniting work from several areas of AI. It is an integrated level-bridging model of emotion where the high-level account results from lower-level processing. The 'PSI' theory is unique in that emotions are not defined as explicit states but rather emerge from modulation of information processing and action selection. They become apparent when the agents reflect their interaction with the environment, resulting in a configuration that resemble emotional episodes in biological agent. Emotions are intertwined with dispositions to perceive, imagine, recall, memorize, plan and act in a certain way.

Dörner's agents react to the environment by forming memories, expectations and immediate evaluations. They possess a number of fixed but individually different parameters such as resolution level, selection threshold, activation and rate of updating. Each of these levels lie within a range of intensity. These parameters together with built-in motivators such as level of competence, knowledge, urgency of motives, importance of motive and the experienced uncertainty produce complex behavior that can be interpreted as being emotional.

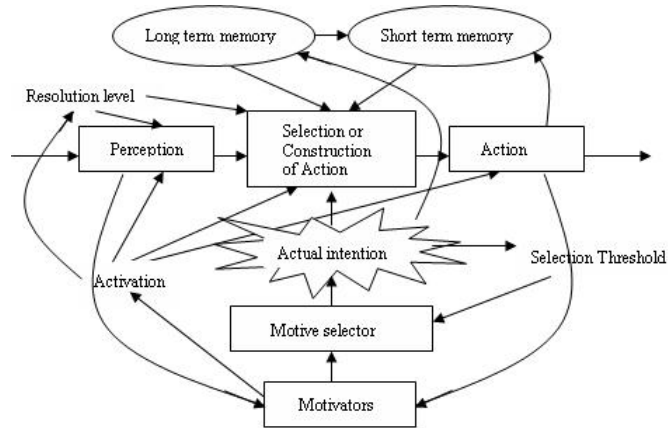


Fig. 1. The Internal structure of PSI

### 3 Possible advantages of the ‘PSI’ model on ECA

The ‘PSI’ model can create agents that adapt effectively to the environment and generate appropriate emotions accordingly. Instead of triggering a specific predefined emotion, it is possible to reflect mixture of emotions based on the continuously changing intensities of the modulation parameters. This, for example, leads to a gradual change of emotional expression in the ECA and gives more colours as well as variation to the type of emotions that can be experienced.

### References

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