

Towards a experience-based artificial intelligence

by Ricardo Téllez and Oscar Vilarroya

Summary of the poster

EXPERION

Definition: A slice of the life of a cognitive being. They are generated by the cognitive system, after all the sensorial, perceptual, cognitive and emotional processes have intervened. So, it contains conscious and unconscious elements. It does not correspond to anything concrete and may not be expressible from the being perspective.

AI application: an experion in the robot would be the value of all the sensors, actuators and internal states of the robot at one time step.

Questions:

- 1) Is an experion like an information compressed instant of the life of the being?
- 2) What type of process perform the sensors before giving the resulting values to the generation of one experion?

CONTENT

Definition: Any element that is part of an experion. Is the group of elements that the cognitive system can discriminate on an experion. They are generated *a posteriori* (first is the experion, then they are the contents).

Example: Lukas and Katheryn see an apple. Lukas is hungry but Katheryn wants to paint. Even that the situation perceived is the same, the experion for each one is very different.

For Lukas the experion is composed of the contents:	For Katheryn the experion is composed of the contents:
<ul style="list-style-type: none">- table- apple- hungry sensation- relation between apple & hungry- other non-expressible	<ul style="list-style-type: none">- table- apple- wish to paint- relation between colors & wish to paint- other non-expressible

At first, contents does not exists on experions perceived. They start to be created when many experions are cumulated and correlations between them are found by the cognitive system.

AI application: to obtain the *content* of 'ball', the robot must be able to find the correlation existent between all the experions that contain the ball in it, which will define the content of ball (among other contents that may exist on those experions).

MEANING

Definition: is the particularity of each experion. It determines what the experion has as original. It is composed of two parts:

- The outline: is what excels on the experion
- The ground: is the context on which the experion happens

The *meaning* of an experion exists only within that experion. Its goal is to help to understand other experions, by transferring the meaning of one experion into another.

Comprehension is the transference of *meaning* from one experion to another.

Reasonig is the capacity to identify and transfer the correct *meaning* to a newly

experimented situation.

Depending on the outline/ground established, the same experion can have different meanings. One example: the pooling

- 1) on a first case the outline/ground could be established on how the billiard-cue hits the ball, and the ball is moved. This would establish the cause/effect meaning.
- 2) on a second case, the outline/ground could be established on how the ball hits the other ball after the first starts moving. This would establish the before/after meaning.

AI application: this outline/ground mechanism could be seen as an attention mechanism, being the *outline* what the robot pays attention to, and *ground*, the rest of the scene. One first goal in this stage would be to create an artificial attention mechanism that allows the establishment of outline/ground situations. A second goal would be to generate the capacity to transfer those outline/ground pairs from one experion to a similar one.

Questions:

- 1) Is comprehension the generation of a metaphor?
- 2) Is comprehension the capacity to identify the *contents* of a new experion from the *contents* of past experions?.
- 3) Is like establishing the general way in which the new experion must be understood?.

ACTION SELECTION

Definition: In order to generate an answer, the cognitive being must activate **relevant** past experions and combine them in the correct way. So, past experions guide the being on its current situation. To live revisiting life.

AI application: how can the system identify which are the relevant experions for the present situation of the artificial being?. And, once those are identified, how are they combined in order to generate the response?.

INTELLIGENCE

Definition: Capacity to discriminate and manipulate *contents* for action selection.

Intelligence measures how many *contents* can discriminate the being, and how good is the being at transferring those *contents* from one experion to another, establishing relations between them.

AI application: can we measure the intelligence of our artificial system by measuring the contents it can manipulate while performing its assigned tasks?. Which number of content discrimination is required for the robot's task?. How do we establish that number for a given robot/task?. Giving a computational system, it is possible to it to specify the intelligence of the system by determining the maximal number of contents it can generate/manipulate?. Can that system let go to identify by itself the contents and relations it will need for a determined behavior?.