# The Notion of Emotions

Emotions are a type of regulatory feedback mechanism that plays important role in making future decisions within the Semantic State Machine. Emotions record negative or positive historical experiences and influence future decisions which are semantically related to past decisions and past experiences to which there have been attributed emotions of similar sign and order of magnitude. It is important to understand that in order to experience positive or negative emotion the current environment (or context) does not need to be identical or equivalent to a past context. Rather it needs to bear a sufficient degree of semantic similarity. To put this definition on more precise footing let us define the following objects:

: original state of the environment

: a historical context at moment t0

: a chain of thoughts … in context

: decision resulting from the context and the thought chain

: state of environment modified after the execution of decision

: a changed context created after the execution of decision

: a chain of thoughts … generated in the context . All the thoughts in the chain are conditionally dependent on the decision which is one of the reasons for the changed environment .

: a set of Sensibility structures affected by the changed environment .

: a set of emotions produced after the Sensibility structures interact with the changed environment through a chain of thoughts generated as a result of .

The set of emotions are associated with the semantic signature of the chain of thoughts in the context . Let us assume that after some period of time a context is created and a chain of thoughts is generated in it. Let us assume that there is a subset of semantic dimensions in which where is some threshold distance.

Then a set of Emotions will be associated with the chain of thoughts such that

when is small enough. In other words the set of emotions will converge asymptotically with the chosen norm to with the decrease of the semantic distance between and conditioned on the signature dimensions subset . If the set of emotions is generally negative (think *negative definite matrix*) a future decision resulting from the chain of thoughts will be inhibited by a measure corresponding to the strength of the .