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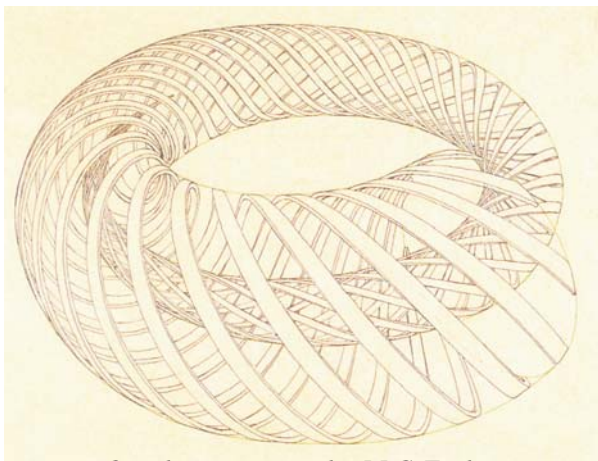
## Is it Utopia or Contradiction to Grow Brain Models towards Models of Mind?

**Motivation:** Understanding intelligence has challenged philosophers and scientists since ancient Greece. The undeniable perceived individuality, consciousness, autonomy and apparent free will also add up to this everlasting quest. In the history of thought there has been a marked antagonistic view between physical and mental processes, *e.g.* Aristotle's 'rational soul', Augustine's concept of memory, Descartes' modal argument and Chalmers' 'zombie-hypothesis'. Although plausible, pure materialistic approaches to mind fail blatantly on topics such as emotions and desires, realms where idealism easily succeeds. Currently digital computers continue to boost human capabilities, this time not only physical, but also mental ones (through explanatory models). Thus, it is fair to ask whether one can grow brain models towards models of mind

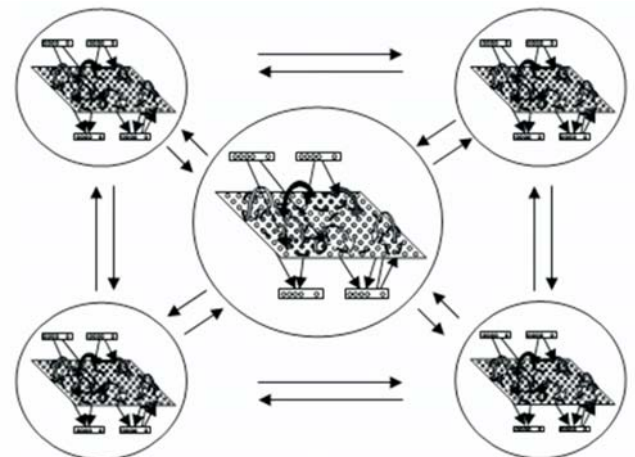
**Hypothesis:** We argue that Hegel dialectic, that is the construction of reality based on understanding and conciliation of opposites, can be of seminal importance in gapping brain-mind models. This could help by pointing out to modelers that they should not simply to select between materialism and idealism. That is, a mind will not come out of a brain model (materialistic view), neither are brains to be seen as loci for minds (idealistic view). Marx and Engels inverted the idealistic dialectic of Hegel by considering opposites as expressions of the same reality. They do not deny the existence of opposites, but propose a dynamic system in which one of the opposites temporarily dominates the system (reality). Therefore, we argue that there is neither a brain nor a mind at the same time, hence it is not utopia, but contradiction to grow brain models towards models of mind.

**Principles:** we may assume that there are at least three neural computation principles:  
1) Individuality of processing (*e.g.* neurons, cortical columns);  
2) Localizability of individual processings (*e.g.* vortexes);  
3) Reflexivity of all neural computations (*i.e.* among uits).

**Objective:** As in the ancient symbol of *Ouroboros* (see figure on the left) - the mythical serpent eating its own tail - meaning cyclicity, we set out to produce computer simulations that encompass previously produced results in their invocation of new instances. This is very similar to recursive computer functions with the difference that (i) some instances are not completely identical and (ii) the complexity of all of them is inherently high (see figure on the right).



*Ouroboros as seen by M.C. Escher*



*Multiple-coupled Venn-networks as proposed by F. Buarque*

**Expected results:** If the planned simulations using *multiple-coupled Venn networks* really succeed in taking into account the echoes of their own computations thereby, generating some momentary inconsistencies, without disturbing seriously the expected results. We hope to expand the approach to explaining how the mind could be seen as these 'generative inconsistencies' that alternate cyclically either (i) by processing new data and (ii) by *listening* to data that has just been processed. Clearly it is too early to say much about the implications of these ideas when applied to real-world computations but they may contribute to shedding some light on the understanding of the connections between mind and brain.

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