ID de Contribution: **8** Type: **Non spécifié**

René Thom and semantic information

jeudi 21 septembre 2023 10:50 (50 minutes)

René Thom was not satisfied by the mathematical formulation of the notion of information, mainly restricted to a statistical theory without reference to meaning (note that Shannon in 1948 also expressed his unsatisfaction), and he suggested several leads to remediate (cf. Stabilité Structurelle et Morphogénèse, 1972, 1977). Part of the work of Thom in the eighties, can be considered as a development of these ideas about information (or "more exactly signification"), based on forms appearing in topological dynamics and singularity theory, for applications to Biology, Linguistic and Philosophy (cf. Esquisse d'une Sémiophysique, 1988). This work of Thom aimed at the same time, to understand what is intelligibility and invention in human individuals and societies.

In fact, part of the exigences of Thom are realized by variants of Shannon's theory, going back to Carnap and Bar-Hillel, 1952, but now without any use of probability and statistics. In this approach, semantic information relies on semantic structures (present in formal languages), through the consideration of their homotopical invariants, that can be themselves topological spaces. As evoked by René Thom himself, the vanishing homology of singular functions is a prototype of "information theory"; moreover, it gives an indication for the origin of semantic structures in general. Recent researches come from the necessity to understand what is a "semantic functioning"in artificial neural networks, and what are its obstructions (Belfiore and Bennequin, Topos and stacks of deep neural networks, 2021). An example will be given in relation with psychological experiments about simple concepts, their learning and use (Belfiore and Bennequin, Spaces of semantic information, 2023).

Orateur: Prof. BENNEQUIN, Daniel (IMJ-PRG)