About the Necessary Move from Cognitics to Ethics; Additional Definitions, and Metric Contributions in MCS

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Abstract

Progresses in microelectronics and software engineering have since long pushed information processing up to abstraction levels well above transmission and coding marks, up to heights better characterized by cognition. Technical activities and automation in this context, along with the associated scientific developments, have lead to the notion and practice of cognitics. Metrics have been introduced, including specific units, in particular for knowledge, expertise or learning.

In an evident manner, metrics show that reality cannot be perceived and known in any degree of completeness, but infinitesimal. So much for the cognitive path.

A fundamental change of paradigm is therefore to be made. Instead of the traditional deductive pattern which makes us hope to forecast and control the future as a result of past and current conditions, we must in priority start by freely projecting our goal(s) in some convenient future; then induction and backtracking dictates our intermediary actions and indeed the proper selection and/or elaboration of (ancillary) models. Ethics is what characterizes the process of choosing good goals (and conditions).

The paper presents the fundamental definitions and units of our MSC theory, presents illustrative examples, and elaborates on the necessity of addressing ethical issues. In this process new notions are rigorously added to the theory, relating to sapience and wisdom.

Quantitative assessment of cognitive properties will be made, in representative cases of autonomous, mobile robots. Interaction of a robot with humans, or with a group of other, cooperating robots will be discussed.

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