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Accelerating Future / abstracts of research ideas

The end of XX century and the beginning of the XXI century is characterized by a splendid development of the research concerning mathematical induction and Bayesian paradigm. I do not agree with the opinion of Marcus Hutter that we have surmounted the problem of induction. Particular techniques of optimization and maximization of reward are being developed, yet the General Theory is not being constructed.

My aim is to conduct a metaresearch on the future of humanity, on the collision of different currents and the emergence of new domains of science and technology, which enable scientific and technological acceleration. Examining how new ideas emerge from the spectrum of various previous ideas and forms and form different directions. The aim is to construct a metatheory capable of describing it and which may shape and accelerate the development of scientific methods. Some prevailing attempts of describing the evolution of biological systems and the constitution of intelligence on the planet, such as Turchin's concept of metasystem transition, have a sequentially hierarchical grasp of the occurring processes and thus a very limited application and are attempts of describing what we already know, the past and the evolution of ancient life forms on the planet. **To put it in different terms the problem is that nowadays individual paths of exponential growth of particular technologies are being examined instead of their influence on each other.** In my opinion the results, which lead to Singularity, derive not from the exponential growth of computations rate, but rather from a reciprocal influence of interlacing revolutionary domains of science and technology. Therefore the aim of my research will be to examine different types of synergy, which occur between domains. Obviously in the scientific environment there are certain historical examples, for instance the influence of von Neuman's concept on Circa and the concepts of DNA, yet theories which could describe the influence of particular concepts on each other in a reasonable manner don't exist. The development of fast transfer net of scientific ideas results in the acceleration of scientific research. In the future the ideas will disseminate even faster, while the most radical and general will strike various domains and lead to the emergence of new ones. These truly chaotic processes will induce exponential growth in increasingly shorter time intervals. Models which will allow for predicting this process and measures which will allow for measuring and predicting them are required. To put it in different words we want to predict a natural continuation of the path/space of superintelligent machines development in order to make beneficial decisions and to accelerate or shape them so as to make them advantageous for humanity. Proving that given model is optimal for a big class of problems and that it simultaneously covers the development of AI, nanotechnology, bioengineering.

Building of reference points and critical points

The aim is also to find an absolute general criterion for the development of superintelligent machines, for building measures and borders for superintelligent machines, regardless of whether this construct is initially calculable and has practical application. Recent theoretical and practical progresses have led to a renaissance in the domain of universal learning machines and optimal searching. However in my opinion we are still unable to define and measure General Artificial Intelligence. The attempts made by Goertzel on one hand and Hutter and Legg on the other only reveal traditions and techniques which they employ [general training in post Kolmogorov probabilistic techniques and post Solomonoff mathematical induction plus reinforcement learning]. Currently the attempts concern practically executable, computable options of old methods, which were not computable. At least new AGI is not heuristic. The nature of heuristics is the lack of persistence- they are quickly replaced by better ones and this

is precisely why in my opinion the can not be applied in Meta science concerning the development of superintelligent machines and other radical forms of science. The bayesian paradigm is becoming dominant in science. My aim is to examine its limitations. Bayesian agent possesses convictions concerning possible causes of an event that are dependent on all previously obtained informations and that is why they are subjective. System of convictions, completely consistent with Bayes' framework is of course unrealistic as a pattern for human behavior, because it would require perfect updating in every case, while we still receive new informations. My approach highlights differences between countable and uncountable sets and measures. I am interested in limit-computable universal measures, not uncomputable Slomonof-Levine style [semi] measures. Another problem is self-optimizing of measures. **I propose universal measure over the class of measures.** I put stres on research concerning limitations and special numbers (Chaitin's Omegas and more random Schmidhuber's SuperOmegas).

Accelerating Future: Self-Improvement as Self-Change of Changes

However the central category of my research is AI self-improvements. With a stress on "SELF", with the whole complexity of the research in different domains concerning self-reference and self-production. Self-improvements of AI as a golden rule leading to the accelerated growth of system intelligence. Researches on optimization and interesting works concerning supercompilation and self-rewriting of programs are being conducted. My aim is to examine different kinds of Self-improvement techniques and to propose General Theory of Self-Improvements, which will have application in various knowledge domains. This will enable particular techniques to influence each other and to intertwine. It can be said that it will be a metatheory of of self-improvements optimization or, to put it differently, metatheory concerning the self-improvements of self-improvements. This theory will have a fundamental significance for the development of humanity and understanding of the occurring changes.

Techniqalia: Quest against sequences reasonings

The influence of algorithmic information theory and Solomonoff's APL caused, that nowadays inferring is based on linear sequences [on chains or completely random sequences]. Hutter AIXI model or Schmidhuber OPSS are only about agents interacting with environment to compute action sequences that maximize future reward. However most serious mathematic and engineering problems [including the constitution of AGI] cannot be reduced to sequences. In current research a whole class of intermediate structures, which are only partially ordered, is being neglected. That is why part of my research proposes mechanisms of inferring based on weighted partially ordered sets as essential for the emergence of AGI. Transformation of multidimensional structures and nonsequential inferring is a domain which must be developed. (framework that will enable construction of class of self-improvement software, spaceships and robots, which can maximize the reward from environment and optimize their activities).

Social and axiological aspects

To show how the increasing of data processing tempo induces increasing of a number of conflicts. In the future the scenario will be even more complicated because part of the players will be superintelligent autonomous programs. Therefore long-term future of machine intelligence and AI is related with the increase of social conflicts. This is why research concerning the reducing of SF factor [Supreme Fascist], to speak in Paul Erdos terms, and global risk is of crucial importance. In wide bandwidth network societies with superintelligencies the concept of "ego" and "free will" should be redefined.