

The Global Brain: a Self-organizing, Distributed Intelligence Emerging from the Web

Abstract:

Distributed intelligence is an ability to solve problems and process information that is not localized inside a single person or computer, but that emerges from the coordinated interactions between a large number of people and their technological extensions. The Internet and in particular the World-Wide Web form a nearly ideal substrate for the emergence of a distributed intelligence that spans the planet, integrating the knowledge, skills and intuitions of billions of people supported by billions of information-processing devices. This intelligence becomes increasingly powerful through a process of self-organization in which people and devices discover and selectively reinforce useful connections, while getting rid of unproductive ones. This leads to ever larger coordination and synergy, and ever lower conflict and friction between actions and agents.

This process can be modeled mathematically and computationally by representing individuals and devices as agents, connected by a weighted directed network along which "challenges" propagate. Challenges represent problems, opportunities or questions that must be processed by the agents to extract benefits and avoid penalties. Link weights are increased whenever agents extract benefit from the challenges propagated along it. The Global Brain Institute is developing such a large-scale simulation environment in order to better understand how the web may boost our collective intelligence.

The anticipated outcome of that process is a "global brain", i.e. a nervous system for the planet that would efficiently tackle both global and personal problems. Thanks to accelerating developments in ICT, that system is likely to grow so much in capabilities in the next few decades that it would eventually exhibit a pragmatic version of the attributes of omniscience, omnipresence, omnipotence and omnibenevolence. While there are still a large number of dangers on the road to such a benevolent collective intelligence, the scenario I propose is fundamentally optimistic. It thus provides a much needed counterweight to the endless gloom-and-doom predictions inspired by global conflicts, apparently unsustainable growth, and out-of-control technological developments (such as superintelligent robots), which neglect both the promises and limitations of self-organization.

References:

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