

Wisdom technology

Andrzej Skowron, Warsaw University

There are many indications that we are currently witnessing the onset of an era of radical technological changes in the development of intelligent systems. Intensity of these radical changes depends on the further advancement of methods making it possible to embed in intelligent systems skills for acquisition, representation, processing, communicating, discovering and adaptive learning wisdom. By wisdom, we understand ability for making accurate, i.e., correct to a satisfactory degree, (adaptive) judgments having in mind real-life constraints. The intuitive nature of wisdom understood in this way can be expressed by the so called wisdom equation, metaphorically as shown in

$$\textit{wisdom} = \textit{interactions} + \textit{knowledge} + \textit{adaptive_judgment}.$$

We call this technology *wisdom technology* (or *Wistech*, for short). *Wistech* can be treated as the successor of database technology, information technology, and knowledge management technology. *Wistech* include approximate reasoning by agents or teams of agents about vague concepts concerning real-life dynamically changing, usually distributed, systems in which these agents are operating. Such systems consist of other autonomous agents operating in highly unpredictable environments and interacting with each other.

We discuss the *Wistech* foundations for interactive and adaptive computations leading to perception as well as foundations of approximate reasoning based on granular computing and rough set theory. In particular, methods based on rough set theory and ontology approximation for complex vague concept approximation are outlined. We also report applications of the discussed approach in real-life projects such as medical decision support, identification of complex behavioral patterns or sunspot classification from satellite images.

References

1. A. Jankowski, A. Skowron: Logic for artificial intelligence: Rasiowa - Pawlak school perspective. In: A. Ehrenfeucht, V. M. Marek, M. Srebrny (Eds.), Andrzej Mostowski and Foundational Studies, IOS Press, Amsterdam (2008) 106-143.
2. A. Jankowski, A. Skowron: Wisdom Technology: A rough-ganular approach. In: M. Marciniak, A. Mykowiecka (Eds.), Aspects of Natural Language Processing. Essays Dedicated to Leonard Bolc on the Occasion of His 75th Birthday. Lecture Notes in Computer Science 5070 (2009) 3-41.