

Abstract



How the SP Theory of Intelligence may help in the advancement of knowledge in self-sufficient robots

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### Abstract:

The SP System, meaning the SP Theory of Intelligence and its realisation in the SP Computer Model, is the product of a lengthy programme of research, which now provides solutions or potential solutions to several problems in AI research [1]. There is an extended overview of the SP System in [2], and there is a much more comprehensive description in [3]. Details of related publications, with download links, are on www.cognitionresearch.org/sp.htm.

This presentation focusses on autonomous robots and how the SP System may prove useful in the development of intelligence in such robots. A peer-reviewed, published, paper about this is in [4].

The main parts of this presentation are described in the following three sections.

Problems in the development of intelligence in autonomous robots

The main problems in the development of intelligence in autonomous robots are these:

- How to increase the computational efficiency in robots, with reductions in energy consumption, and in the size and weight of computers.
- How to achieve human-like versatility in intelligence.
- How to achieve human-like adaptability in intelligence.

Outline of the SP theory and the SP Computer Model

The overarching goal in the development of the SP System has been to search for a framework that would simplify and integrate observations and concepts across artificial intelligence, mainstream computing, mathematics, and human learning, perception, and cognition. Despite the ambition of this goal, it seems that promising solutions have been found.



## Biography:

J Gerard Wolff PhD CEng MIEEE is the Director of Cognition-Research.org. He has held academic posts in the School of Computer Science and Electronic Engineering, Bangor University, the Department of Psychology, University of Dundee, and the University Hospital of Wales, Cardiff. He has held a Research Fellowship at IBM, Winchester, UK, and has been a Software Engineer with Praxis Systems plc. He received the Natural Sciences Tripos degree from Cambridge University, Cambridge, and the PhD degree from the University of Wales, Cardiff. He is also a Chartered Engineer and Member of the IEEE.

## Publication of speakers:

- 1. Problems in AI research and how the SP System may help to solve them" (PDF, tinyurl.com/yxb8h822, submitted for publication).
- 2. The SP Theory of Intelligence: an overview" (PDF, Information, 4 (3), 283-341, 2013, bit.ly/1NOMJ6l).
- 3. The book Unifying Computing and Cognition: the SP Theory and Its Applications may be obtained via links from tinyurl.com/y4f55a45.
- 4. "Autonomous robots and the SP Theory of Intelligence" (PDF, IEEE Access, 2, 1629-1651, 2014, bit.ly/18DxU5K).

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