

Multiple alignment as the “double helix” of intelligence

Synopsis of a talk about the SP theory of intelligence and its benefits and applications

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A central idea in the *SP theory of intelligence* and its realisation in the *SP computer model* is the powerful concept of *multiple alignment*, borrowed and adapted from bioinformatics.

Multiple alignment provides a key to the simplification and integration of observations and concepts across artificial intelligence, mainstream computing, mathematics, and human perception and cognition. It has the potential to be the “double helix” of intelligence, to be as significant for an understanding of intelligence as is DNA for biological sciences.

The SP system, as it has been developed to date, has strengths and potential in several areas of AI, including unsupervised learning, the processing of natural language, fuzzy pattern recognition, recognition at multiple levels of abstraction, best-match and semantic forms of information retrieval, several kinds of reasoning, planning, and problem solving.

A major strength of the SP system is how it may promote seamless integration of diverse kinds of knowledge and diverse aspects of intelligence—an integration that appears to be essential to achieve human-like versatility and adaptability in artificial systems.

The SP system has many potential benefits and applications in AI and beyond. These include helping to solve nine major problems associated with big data, the development of versatility and adaptability in autonomous robots, the development of computer vision, and more.

Details of publications in the SP programme of research are given, in many cases with download links, on www.cognitionresearch.org/sp.htm, and on linked web pages. Please send questions or comments to me at jgw@cognitionresearch.org.

Gerry Wolff’s first degree is in Natural Sciences from Cambridge University, with a main focus on Experimental Psychology. His PhD, at the University Hospital of Wales and the University of Wales Cardiff, is in the development of computer models of the learning of a first language. He continued this work as a Lecturer in Psychology at the University of Dundee. Several years working in the computing industry, first on a one-year fellowship with IBM and later with Praxis Systems plc, sowed the seeds from which the SP theory has grown. The theory has been brought to its present relatively mature form via research, first in the Department of Informatics, University of Wales Bangor, and then in CognitionResearch.org.

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