News release

For further information, please contact:
Gerry Wolff
+441248712962
jgw@cognitionresearch.org

Mathematics as compression of information

12/05/2020 CognitionResearch.org

A recently published paper [1] by Dr Gerry Wolff of CognitionResearch.org in Menai Bridge, UK, describes an entirely new understanding of the basics of mathematics. This new perspective sees mathematics as a set of techniques for the compression of information, and their application. The paper also argues that similar principles apply to logic and computing.

A thorough search of relevant literature, including the many 'isms' in the philosophy of mathematics, shows that nothing like this has been published before.

Dr Wolff said: "The idea of 'Mathematics as compression of information' fits well with much evidence that information compression is an important principle in human learning, perception and thinking" [2]. And: "This connection should not be surprising since mathematics is the product of human brains and is designed as an aid to human thinking."

This new perspective is a spinoff from a lengthy programme of research developing the *SP System* [3], meaning the *SP Theory of Intelligence* and its realisation in the *SP Computer Model* [4]. In keeping with the other research, compression of information is fundamental in how the SP System works.

Because mathematics and the SP System have similar foundations, there is potential to create a *New Mathematics* by amalgamation of the two, perhaps also with logic and 'computing'. Potential benefits of this New Mathematics include: helping to make mathematics easier to learn and to understand; adding an AI dimension to mathematics; extending the range of applications of mathematics; helping in the development and integration of scientific theories; introducing new kinds of reasoning into mathematics; and more.

[1] "Mathematics as information compression via the matching and unification of patterns," *Complexity*, vol. 2019, Article ID 6427493, 25 pages, 2019, *DOI:* doi.org/10.1155/2019/6427493 (PDF, bit.ly/2LqUHIr).
[2] "Information compression as a unifying principle in human learning, perception, and cognition," *Complexity*, vol. 2019, Article ID 1879746, 38 pages, 2019, *DOI:* doi.org/10.1155/2019/1879746 (PDF: bit.ly/2GdIqnY).
[3] "The SP Theory of Intelligence: an overview" (PDF, *Information*, 4 (3), 283-341, 2013, bit.ly/1NOMJ6l).
[4] "Unsolved problems in AI, described in the book 'Architects of Intelligence' by Martin Ford, and how they may be solved via the SP System" (PDF, bit.ly/2yg5GRy, submitted for publication).

Full bibliographic information

J. Gerard Wolff, "Mathematics as information compression via the matching and unification of patterns," Complexity, vol. 2019, Article ID 6427493, 25 pages, 2019, DOI: doi.org/10.1155/2019/6427493 (PDF, bit.ly/2LqUHIr).

Notes for editors:

Dr Gerry Wolff may be contacted via jgw@cognitionresearch.org or +44 7746 290775.

Apart from the referenced papers, details of several other peer-reviewed papers and documents may be seen on http://www.cognitionresearch.org/sp.htm.