

Brains, artificial neural networks, and some future hardware issues

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Abstract

Biological brains operate in distinctive ways that are, for the most part, entirely different from the HW operation of computers (whether serial or parallel) and the SW operation of conventional programs. Some of these differences -- in algorithms and organization -- may be “merely” matters of implementation having no broader significance, but other differences are crucial for understanding what gives a mammalian brain capabilities that present-day computers and algorithms cannot match.

I will give an overview of those aspects of neuroscience and artificial neural networks (ANNs) that seem likely to be relevant to the hardware design of future ANN devices, circuits, and systems. The talk won't assume any previous knowledge of either neuroscience or ANNs.