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Preface

Artificial neural networks (ANN) is the name given to a branch of artificial intelligence (AI) research that aims to simulate intelligent behavior by mimicking the way that biological neural networks work. Most AI methods seek to reproduce human intelligence by imitating "what we do," ANN seek to reproduce it by imitating "the way that we do it." The origins of ANN predate computers by some decades, but it was not until computers became generally available that real progress could be made in the development of these methods. There was a slight "glitch" of a decade or so following the publication of a book that heavily criticized the possibility of ANN developing into anything useful; since then, progress has been dramatic and these tools have moved on from being oddities used by specialists to general-purpose algorithms for data analysis and pattern recognition tasks.

As with all new techniques, the adoption of ANN by scientists in other fields had a slow start, which soon accelerated. Their use in chemistry, for example, has been documented (see J. Zupan and J. Gasteiger, *Neural Networks in Chemistry*, Wiley-VCH, Weinheim, Germany) by the number of papers: 3 (1988), 5 (1989), 20 (1990), 105 (1991), 290 (1992), . . ., 927 (1997). *Artificial Neural Networks: Methods and Applications* reports the history of the application of ANN to chemical and biological problems, gives a guide to network architectures, training, and the extraction of rules from trained networks, and covers many examples of the application of ANN to chemistry and biology.

David J. Livingstone

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