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Introduction to Neural Networks

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Preface

Neural networks have finally arrived in the 1990s and have generally been accepted as a major tool in the development of 'intelligent systems'. Their origins go way back to the 1940s, when the first mathematical model of a biological neuron was published by McCulloch and Pitts. Unfortunately, there was a period of about 20 years or so when research in neural networks effectively stopped.

It was during this period that I first became interested in neural networks, in the relatively obscure area of threshold logic, which is an attempt to replace the conventional building blocks of computers with something more like artificial neurons.

I was pleased but surprised when, in the mid 1980s, there was a resurgence of interest in neural networks, largely prompted by the publication of Rumelhart and McClelland's book, *Parallel Distributed Processors*. Suddenly, it seemed that everyone was interested in and talking about neural networks again.

It soon became apparent that during these lean years, now eminent names such as Widrow, Kohonen and Grossberg for example, had continued working on neural networks and developed their own versions. Problems, such as the exclusive-or, which had originally contributed to the demise of neural networks in the 1960s, had been overcome using new learning techniques such as back-propagation. The result has been that researchers in the subject now have to familiarise themselves with a wider variety of networks, all with differences in architecture, learning strategies and weight updating methods.

This book gives a very broad introduction to the subject, and includes many of the dominant neural networks that are used today. It is ideal for anyone who wants to find out about neural networks, and is therefore written with the non-specialist in mind. A basic knowledge of a technical discipline, particularly electronics or computing, would be helpful but is not essential.