

Preface

This edited collection of papers entitled *Artificial Intelligence: An International Perspective* originated with a proposal by the President of the International Federation for Information Processing (IFIP), Professor Basie von Solms, for the IFIP Technical Committees to publish ‘position papers’ on their technical areas.

Each Technical Committee has members nominated by national computer societies worldwide as their representatives. In the case of the Technical Committee on Artificial Intelligence, which I chair, the committee has members from over 35 countries and organizes a program of events on a worldwide basis through its six working groups. Like all IFIP Technical Committees, it is well placed to give an international perspective on its specialist area.

Artificial intelligence (AI) is a rapidly growing inter-disciplinary field with a long and distinguished history that involves many countries and considerably predates the development of computers. It can be traced back at least as far as ancient Greece, where Homer’s *Iliad* (ca. 850 BC) told the story of how Hephaestus, the god of fire, having been cast out of Olympus creates artificial attendants to assist in his forge. The text states: “They are golden, and in appearance like living young women. There is intelligence in their hearts, and there is speech in them and strength, and from the immortal gods they have learned how to do things.” Modern technology has not yet caught up with Homer, although robots in a variety of shapes and sizes are now commonplace. Five hundred years later, the attempt by the philosopher Aristotle (384 BC – 322 BC) to classify all valid forms of argument used by humans into 19 types known as ‘syllogisms’ can now be seen as pioneering work on understanding human reasoning in a field that was not even to be named for more than another 2,000 years.

“El Ajedristica,” the first automaton to perform a non-trivial task (playing an endgame in chess) was built as long ago as 1890 by the Spanish inventor Luis Torres y Quevedo. This followed a famous and long-running hoax where a chess-playing machine was created in 1769 by Baron Wolfgang von Kempelen, a member of the court of Empress Maria Theresa in Vienna, and was exhibited around the world for the next 80 years. Dressed in the style of a Turk and seated at a cabinet with a chess board fixed to its top surface, it played and defeated opponents that included Napoleon, Frederick the Great, Benjamin Franklin and, it is said, Charles Babbage, until the secret was discovered: there was a small human chess player concealed inside the cabinet at which the Turk sat who operated the Turk’s hand by means of a pantograph.

In modern times, the celebrated computing pioneer Alan Turing was a leading advocate of AI and made significant contributions to the field in the 1940s and 1950s before his untimely death in 1954. In 1950 he proposed the imitation game

(now known as the ‘Turing Test’) by means of which it might be said that a machine was intelligent. In the same paper he said that “I believe that at the end of the [twentieth] century ... one will be able to speak of machines thinking without expecting to be contradicted.” Turing’s timing turned out to be inaccurate, but the overall prophesy seems to be coming ever closer.

The original concerns of the field of AI (a name coined in 1956) were predominantly tasks such as playing games, solving puzzles, understanding natural language and automating mathematical theorem proving. Now that a computer has convincingly beaten the world chess champion, interest in that area has waned but in return there is commercial interest on a scale that could never have been anticipated in the past, with many hundreds of so-called expert systems (predominantly but not wholly rule based) developed in the 1980s and 1990s and since then many other commercial applications, increasingly involving the techniques of machine learning.

Today the field is large and expanding with many of the concerns of its practitioners very far from the original core areas. The time when any single volume could realistically claim to give an overview of the entire field has long passed. Instead this collection of papers aims to present an international perspective on the field from the viewpoint of expert members of Technical Committee 12, its Working Groups and their colleagues. The authors come from ten countries across three continents.

Three of the papers give overviews of work in countries (France, Italy and Chile) whose publications are not always accessible to an English-speaking audience. The inclusion of Chile in this list may seem surprising but that country has a long involvement in AI, most famously for a project which aimed to apply AI and cybernetic theory to government, which was begun by President Salvador Allende as long ago as 1971 and terminated prematurely by the coup against his government in September 1973. The other nine papers describe important relatively new or emerging areas of work in which the authors are personally involved. They are “Text and Hypertext Categorization”; “Autonomous Systems”; “Affective Intelligence”; “AI in Electronic Healthcare Systems”; “Artifact-Mediated Society and Social Intelligence Design”; “Multilingual Knowledge Management”; “Agents, Intelligence and Tools”; “Intelligent User Profiling” and “Supply Chain Business Intelligence”. They provide an interesting international perspective on where this important field is going at the end of the first decade of the twenty-first century.

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