

# Preface to the AAAI Edition

Julian Feldman and I wrote the preface to the first edition of *Computers and Thought* in 1962. At that time the now omnipresent computer science departments had not yet been invented by universities. Julian and I were young assistant professors at the University of California, Berkeley, School of Business Administration. Artificial Intelligence was a tiny field of a few hardy pioneers, their graduate students, little funding, almost no published books, and no textbook.

Julian and I introduced a course in computer modeling of thought (at the Business School!) but had no book to teach from. Eureka! A niche, in which two young professors could help the field, as well as easing their own teaching. The easiest way to do that was to assemble the papers of the time that we thought were seminal or particularly noteworthy; knit them together with interstitial material explaining their importance; and publish an extensive bibliography of papers of the growing field. Thus was born *Computers and Thought*.

One of the founders of AI, one of AI's major contributors throughout its history, and its only Nobel laureate, Herbert Simon, was a consulting editor for Prentice Hall at the time. He recommended against publishing *Computers and Thought* because of its potentially small sale. That was probably one of Herb's worst judgement calls. McGraw Hill was willing to gamble. *Computers and Thought* was published in 1963 and indeed was a big seller for a decade. In an odd way, *Computers and Thought* had an impact upon publishing in the embryonic field of Computer Science. Publishers were wary of venturing their money on books in this new field. They would call Julian and me, seeking information on sales of *Computers and Thought*, the thought being that if books were selling in the arcane sibling AI field, then maybe Computer Science was not such a gamble.

*Computers and Thought* was translated in several foreign editions. The Russians removed the article by Armer that discussed Soviet AI work, and substituted another of their choice, all without permission. They promised to pay royalties, but in the end never did. An edition in Japanese helped to launch AI in Japan. Other editions were Polish and Spanish.

Eventually McGraw-Hill decided to take the book out of print, and sold the reprint rights to a publisher specializing in otherwise-out-of-print books. Another version was thus available for about a decade. Then, a few years ago the second publisher took it out of print, seemingly with finality.

But by that time, the book had become a “classic” and there was continuing demand for it. McGraw-Hill returned the rights to Julian and me, and we donated them to the American Association of Artificial Intelligence for the publication of this historical edition.

*Computers and Thought* is indeed a treasure. Some of the papers are as important today for their fundamental ideas as they were in the late 1950s and early 1960s when they were written. Others are interesting as early milestones of fields that have expanded and changed dramatically. A few are interesting in that they represent work that simply did not go anywhere. Some of the papers describe key work that is not typically taught any more, but is “buried” deeply in the conceptual structure of AI—a heritage that needs to be honored and preserved.

The papers of *Computers and Thought* had all been published somewhere else. Equity demanded that the royalties be divided equally among the authors of papers. But the royalties were expected to be small, and one-*n*th of the royalties would make no noticeable dent in anyone’s style of living. So Julian and I got the permission of all to donate the royalties in the service of a good AI cause. Allen Newell was asked to chair the committee that determined what that good cause was to be. He accepted on the condition that the committee be a committee of one. Eventually, the good cause emerged: a prize for excellence of contribution to AI by a young researcher. This prize is called the Computers and Thought Award, and is administered by the International Joint Conference on Artificial Intelligence (IJCAI). It has matured into one of the most prestigious awards offered in the AI field.

From the hardy band of pioneers grew a professional scientific field that is very large and vigorous. Tens of thousands of its researchers and practitioners belong to the AAAI, the IEEE, ACM’s SIGART, the Association for Computational Linguistics, similar societies in Europe, Japan, and indeed all over the world. As the field grew and matured, it spun off professional groups in neural networks, fuzzy systems, expert systems, pattern recognition, and host of other specialties. AI is not one enterprise but a whole family of related enterprises. There are tens of thousands of practicing software engineers who are doing applied AI work. Recently I attended a planning meeting in which the US Army was defining an official professional career path called “AI Specialist” for the staffing of their two hundred AI projects!

Today’s young AI researcher can not easily imagine the excitement of the early years of AI, from which the papers of this volume are drawn. Nor can they imagine the computer resources that were used to do the early work. The Macintosh with which I write this preface has by far more processing power, more RAM, and more disk memory than the sum of all the computers that were being used by all the AI researchers of the period 1956-62. I wrote the earliest version of the EPAM program described in this book in 2000 words of rotating drum memory of the IBM 650 (by count that was 20K bytes, but they couldn’t be used very efficiently as bytes). It was seen as a tremendous leap upward that

later I could do EPAM II (my thesis program) on the 32K words of an IBM 709 and 7090. Newell, Shaw and Simon did their landmark work on the Logic Theorist on an early machine called Johnniac (after John Von Neumann) with a memory of 4K words. There were no word processors, not even time-sharing, and the only interaction came if someone let you take over the multi-million dollar machine. You sat at the console, and interacted through the console lights and switches. The amount of computer power that each of us has routinely available was (I think) not dreamed of by the researchers whose work is in this book.

Let me tell you something else about the papers in this book. With two exceptions (one being the famous survey paper of early AI by Minsky), a critical selection criterion was that the paper had to describe the experimental results from a running computer program. The view was that if a cognitive theory on which you were basing your approach to AI was worthy of the time and attention of others, it had to have been stated in a language of a computer; and it had to have run on a set of appropriate cognitive tasks to demonstrate at least the sufficiency of the theory. The theory might be wrong, but at least it generated detailed predictions (results of running the program) that were testable.

Newell once called the running-program criterion “the coin of the realm” in our field. All else was talk, philosophy not science. Some researchers of the early days did not use the methodology of the running program, nor even believe in it. Their work did not make it into *Computers and Thought*. Today, there are many more who theorize but do not write programs. For decades, around the world of AI programs there has been a world of AI “talk,” but little has come out of the “talk.” The quest for the intelligent machine has not been a fruitful field for the philosopher or the formalist.

Working in AI has been a privilege and a great gift. The gift was given to Julian and me by Herb Simon during the magic period following the invention of the Logic Theory program. We both carried it with us, to Berkeley, and then to the University of California, Irvine (Julian) and to Stanford University (me). At Stanford I had a double gift of colleagues: John McCarthy, one of AI’s great scientists; and Joshua Lederberg, the Genetics Nobel laureate who helped me and Bruce Buchanan in the creation of the DENDRAL program and expert systems. Always, the science and technology in AI gave me the challenge and exhilaration of working at the cutting edge of something truly grand. And throughout, we all had the gift of a brilliant and generous role model and friend, the late Allen Newell.

The AI field gave me the privilege of serving as a President of the AAAI. And my work in AI led in 1994 to the thrill of sharing the ACM Turing Award with my colleague and friend of thirty years, Raj Reddy of Stanford and Carnegie Mellon Universities. It is from my Turing Award speech that I would like to close this preface.

“The vision of computational models of intelligence, to which we regularly

apply (and then unapply) transient and trendy labels, is one of the great goals that science has envisioned.

It is a truly grand challenge for Computer Science.

*Edward Feigenbaum*  
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With help from  
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