

AAAI President's Message

Happy Silver Anniversary, AI!

Edward A. Feigenbaum

■ Artificial intelligence (AI), on the twenty-fifth anniversary of its naming, is a “kid, finally grown up.” In this letter to his field, Feigenbaum recounts AI’s stumbles and successes, its growing pains and maturation, to a place of preeminence among the sciences; standing with molecular biology, particle physics, and cosmology as owners of the best questions of science.

Happy Silver Anniversary, Artificial Intelligence! Twenty-five years is not long in the history of a science—long enough to achieve, short enough to remember. Your esteemed founders are still around—vigorous, not so young anymore. Out of cybernetics you came, and information-theoretic psychology. You were born in the early days of modern computing, on hot, bulky hardware with names few now remember, like JOHNNIAC; in strange and wonderful software called list structures, with stacks you could “push down” and “pop up,” bearing arcane acronyms like IPL and FLPL. Time-sharing? One signed up on the schedule. Interaction? One pushed keys on the console teletype or panel.

Exuberantly the parents gathered at Dartmouth to admire you, to discuss plans for your future, to agree on a name for you. Heuristic Methods? Complex Information Processing? Automata Studies? Artificial Intelligence. The name stuck.

Oh, that name! How much trouble it has caused you over the years! In the minds of some, *intelligence* was a “reserved word”—reserved for humans, apparently because they got there first; and *artificial* connoted something “ersatz” like “artificial flowers,” or

unpleasant to contemplate, like “artificial insemination.” What prejudice you endured! Some tried to make you live in ghettos with names like “advanced programming languages,” or “information processing psychology.” There was some poverty and some ridicule. To avoid these, many of your scientists deserted your name—to such things as “heuristic programming” or “advanced symbolic manipulation,” or “automatic programming.” Safer, these. But in the end, your name stuck, a source of pride and strength.

Oh, those parents and their exuberance upon your birth! Their joy was well-deserved, for your coming was a great event in the history of human thought. The reduction of the concept of intelligence as symbol manipulation to a physical stratum, a *physical symbol system* as it is now called. Those parents told the world of your birth—its meaning to the study of thought, the new technologies it would support. Joyful parents the world over often do not weigh their words carefully when talking of the new kid. How unfairly you have been roasted over the years by your critics for the early enthusiasms of your parents!

Exuberance faded, as it will, and has been replaced by a more thoughtful mood as AI matures and is taking a respected place among the sciences. No one who attended the First National AAAI Conference (AAAI-80) last August at Stanford University could fail to be impressed by the size and quality of the scientific meeting and the power of the ideas presented. The almost universal impression was that finally the kid had grown up.

Eleven hundred scientists, engineers, R&D managers, students, venture capitalists, and

journalists gathered. The program committee earned the gratitude of all by clearing away wreckage of unrealized dreams, to make room for numerous panels on important and topical matters. Mingled with the usual scientific papers were discussions of impending industrial applications and the motives of companies (mighty and midget) who are now entering the field because of its potential for application. At the silver anniversary of the science, its industry is being born.

Parents and friends fret and worry that perhaps too much is being expected of you as a new adult. Perhaps, AI, you are not as smart as you seem to be; not enough brains or experience to go with your good looks. Perhaps in venturing to attack the big and difficult problems of real application you will fall, will cripple yourself. To put it bluntly, are you able to hold a job? It's a rough and demanding practical world out there.

Do you have enough talent to support the adulthood of your science? Are there only a few dozen contributors clustered in a handful of places, or does your talent run deep? Are you gearing up to produce more trained specialists to staff your new industry? Are the industry and university labs eating your seed corn with a view toward the short-run?

Parents and friends worry too about your sense of history, for like most young adults, you approach each new task as if the past holds no lessons. Have you learned from your many victories that they were mainly triumphs of experimental science; that your winning strategy has been to test ideas in the medium of programs that run? Your work has been most vulnerable to failure when your computing resources have been inadequate. For without substantial machines for your laboratories, you are like an astronomer with too small a telescope; he can see certain interesting things, but his horizons are limited.

In France and Germany, your empirical work is inhibited by the heavyhandedness of bureaucracies and prominent mathematicians whose entrenched position prevents your scientists from obtaining the funds, computers, and communications they need to move forward. England, alas, sleeps, from a dose of pills administered by their government, though whether accidentally or intentionally is still debated. It sleeps restlessly, however, and may soon awake in a burst of industrial activity. The Japanese perceive your potential for application and are moving with their characteristic energy and zeal to master your concepts and techniques.

How fortunate you are, AI, that the path of

most progress—the building and testing of intelligent programs—is also the path of most fun for your scientists. Surely some of them entered the field because its concepts and methods seemed the best available for modeling human cognition; but just as surely, most of your scientists have entered AI because of the immense fascination—the age-old fascination—with the construction of intelligent artifacts. Little is spoken of this motive because it is regarded by some as base; just as some regard as base the idea that science should be fun. But watch the \$100,000 Chess Prize Competition. Fun and challenge will fuel those fires; the money just supplies the focus of attention.

Increasingly our world is a world of information processing, and those who do the world's work are looking to computer science and technology for help. Much of what they need is not numeric or calculational, but symbolic and inferential. Biology? Medicine? Law? Management? The information processing needs of most professions do not fit the molds that computer science has constructed for physical science, engineering, and business data processing. AI, you alone own the mastery of the ideas and methods that will be necessary to bring the power of symbolic computing to the service of the world's needs. Yes, you can be rich as well as famous.

Celebrate your Silver Anniversary with joy, AI. You will have many more, as you earn your place of preeminence among the sciences; for you carry the seeds of human understanding of the greatest importance. What, precisely, is the nature of mind and thought? You stand with molecular biology, particle physics, and cosmology as owners of the best questions of science.



Edward Feigenbaum is a Kumagai Professor of Computer Science Emeritus at Stanford University. Feigenbaum earned his Ph.D. at Carnegie Mellon University from 1956–59. In the 1960s and 1970s he pioneered the development of the expert systems field within AI and, in 1986, was elected to the

National Academy of Engineering. In 1995, he received computer science's highest research honor—The ACM Turing Award. Feigenbaum was the second president of the American Association for Artificial Intelligence, serving from 1980–81.

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