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I'm Sorry, Dave ...

Intelligent Readers,

Happy New Year!

As I write this, I've just celebrated the Jewish New Year, and by the time this letter is published we'll be approaching the end of calendar year 2005, with many other groups celebrating their New Year sometime in between or not long after. New Years are generally a time for taking stock, and this one is a particularly compelling time to do so for those of us in AI.

It's difficult for any field to find a particular date or event that it can point to as the moment of its creation, and AI is no different. Should we date the beginning of modern AI to Alan Turing's 1950 definition of the Turing Test, to the various symposiums that occurred in Britain in the early '50s where the term "machine intelligence" appears to have been coined, or to the workshops and symposiums in the US and elsewhere where the term "artificial intelligence" appears to have entered the lexicon? Whatever date we use, it's pretty clear that the 1956 summer workshop at Dartmouth College was one of most visible early events. So, 2006 makes a great time to celebrate the 50th anniversary of AI's founding, since everyone likes a nice, round number and we didn't celebrate the appropriate anniversary of any of these other events.

First encounters of the AI kind

For one generation of AI researchers (including me), the first encounter with AI wasn't at a workshop but at the movies. Many early movies had a robot or machine that could talk (Gort, Klaatu barada nikto!), but one movie really defined in a moment, for many of us, what AI was all about. That, of course, was Stanley Kubrick's adaptation of Arthur Clarke's *2001: A Space Odyssey*, which starred the computer HAL. And HAL was wonderful! Sure, I know, he went crazy, murdered the crew, and jeopardized the mission, but man, what a machine! A computer (not a robot), who could talk and see, could plan a mission and run a spacecraft, and had more feelings than the somewhat mechanical humans who crewed the ship he ran. It was mind-boggling!

In a day when most of us had never seen a computer, the notion of HAL was almost as alien as that of the movie's mysterious black monolith—maybe even more so. The notion that something like that could be built in our lifetime became a vision that drove many of us into our first computer-programming course. That vision led into grad school in AI and eventually into what looked like a potentially "wasted" career in that weird AI stuff, instead of becoming systems analysts or Wall Street programmers or something where we might someday make some money!

Much has been written about HAL, the movie's influence on our field, and, especially in David Stork's collection *Hal's Legacy* (MIT Press, 1996), whether we could or should build a HAL given today's technology. But that's not really what I want to share. Rather, I want to talk about my more recent experience at a different movie.

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Letters will be edited for clarity and length.

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Meet EDI

This past summer, a reporter invited me to join her at the preview of *Stealth* so that she could get my impressions as an AI scientist. Unfortunately, the movie's plot was weak, the acting was mediocre at best, and the special effects weren't world class, although some were pretty cool. Anyhow, EDI (Extreme Deep Invader), the computer in this movie, was essentially a modern version of HAL (in fact, the movie included a blatant rip-off of, er, I mean tribute to, the famous lip-reading scene). And, as in *2001*, the machine was critical to the plot.

Movie quality aside, the most amazing thing was how unamazing the movie was. Imagine the highest-tech computer you've ever seen controlling the most phenomenal airplane (with munitions to boot) at speeds up to Mach 4 (or as close thereto as the special effects people could imitate). Way cool! And yet, not just to a jaded oldster like me, but also to the kids in the audience and pretty much all the reviewers, nothing about EDI gave the "wow!" that Hal gave us back in 1968.

EDI talked to the pilots it worked with, learned from them (for better or worse), flew its aircraft, fired its guns (again for better or worse), and even (spoiler warning) played the hero at the film's end with an act of self-sacrifice. Yet, none of that seemed so surprising. After all, we've grown used to computer voices, we know the military uses unmanned aircraft, and the notion of a computer that learns isn't that awe-inspiring anymore. Computers are everywhere, and all this stuff is basically just a logical extension of current trends. In fact, I expect that many kids in the audience were probably wondering why the computer was so large.

A long way traveled and a long way to go

And therein lies the point that this movie drove home to me. When the preteen I was in 1968 saw HAL for the first time, I knew I was seeing a vaguely possible future going beyond my wildest expectations. But by the time of EDI, the middle-aged researcher I've become didn't get too excited. Other than the way the computer gained a bunch of extra sentience (if you get hit by lightning, will you get smarter?), not much was going on that didn't seem like a straightforward extrapolation of stuff my colleagues and I are working on. (Ironically, the thing that originally seemed least like science

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Would you like to comment on the future of our field?

IEEE Intelligent Systems is planning an issue on the future of AI, featuring articles and columns by leading AI researchers. If you would like to add your opinion, please email your contribution to Lead Editor Dennis Taylor, dtaylor@computer.org, by 1 February, and we might include it in this collector's-item issue. (*IEEE Intelligent Systems* reserves the right to review submissions and edit for length and style.)

Editorial Board Welcomes and Goodbye

In this issue, we welcome three editorial board members (whose biographies appear below) and say goodbye to long-time member Craig Knoblock. We thank Craig for his years of outstanding service and wish him well in his endeavors.



Kathleen F. McCoy is a professor in the Department of Computer and Information Sciences at the University of Delaware, Newark, with a joint appointment in the Department of Linguistics. She's also the director of the university's Center for Applied Science and Engineering in Rehabilitation. Her research interests are artificial intelligence, natural language generation and understanding, discourse phenomena, rehabilitation engineering, augmentative communication, and assistive technology. She received her PhD from the University of Pennsylvania. Contact her at the Dept. of Computer and Information Sciences, 103 Smith Hall, Univ. of Delaware, Newark, DE 19716; mccoys@cis.udel.edu.



Nina Mishra holds a joint appointment as a senior research scientist at HP Labs and as an acting faculty member at Stanford University. Her research interests are in the design and analysis of data mining, machine learning, and privacy-preserving algorithms. She served as the program chair for the 2003 International Conference on Machine Learning and has served on numerous data mining and machine learning program committees. She also serves on the editorial board of *Machine Learning*. She earned her PhD in computer science from the University of Illinois at Urbana-Champaign. Contact her at 1501 Page Mill Rd., MS 1U-4A, Palo Alto, CA 94304; nmishra@cs.stanford.edu.



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fiction in *2001* was the idea of a spaceship to Jupiter. Yet, a friend's teenager, seeing the movie for the first time last year, thought that

was the really cool thing—after all, since he's been born we've never even gone to the moon.)

So, as we enter this time of stock-taking for the field, it's worth taking a few minutes to savor how far we've come. Computers are amazingly sophisticated, and things that people considered AI once upon a time are now routine (imagine, a computer that could fix your spelling and punctuation—never!). Still, I think some problems we face as a field come from the same place. If AI is losing its luster as the cool field of the future, how do we explain to our colleagues in other fields (and the funders we rely on) that AI still has at its heart the most exciting and fundamental challenge of them all—understanding, and perhaps surpassing, the way we think—the very thing that makes us human!

How do we explain to people that despite having beaten the world chess champion, computers still play many games poorly. How do we explain that, despite computers that speak and listen (when was the last time

you had to call someone by giving a phone number to a real human at the other end of the line?), understanding language in any deep sense is still a major challenge. How do we explain that cars can now run for hundreds of miles by themselves in harsh terrain but still can't help us drive home from work?

I suspect we've fallen into a trap. We've worked hard to show that AI can be relevant and that we can engineer intelligent systems to do important tasks such as the biological research you'll read about in this issue. But we've forgotten to take the time to explain to people the amazingly hard, and scientifically fascinating, challenges remaining. If our field is going to continue to exist (and if 50 years from now you'll be able to sit at your 8-bazillibyte IEEE-Pod watching, on

the holographic feed from *IEEE Intelligent Systems* central, some future editor of whatever this magazine has evolved into talking about AI's first 100 years), then we need to start telling a different story. We need to explain not why we've come so far, but why we have so far to go. ■

Yours,



P.S. As I write this article, the news has just come in that Stanford University's vehicle "Stanley" has won the DARPA Grand Challenge. Let me add my congratulations to the many you've seen by now for team leader Sebastian Thrun and all the team members!

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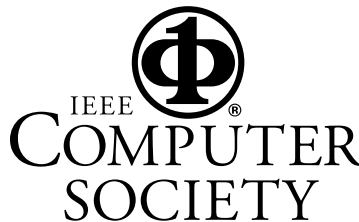
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