In Memoriam

Robert Milne (1956–2005)

Tragically, those high starlit ice fields on the summit of Everest will now be Rob’s last resting place, perhaps fitting for a guy who had always found challenge and respite in the world’s high places.

—Rob Milne Memorial Booklet

Sara Reese Hedberg

Those who knew Rob Milne were stunned by his death on Mt. Everest on 5 June from a heart attack. Pursuing his lifetime dream of climbing the Seven Summits—the highest peaks of the seven continents—he was 1,200 feet from the top of Everest, his seventh and final peak. Milne, an accomplished AI academic, business entrepreneur, and mountaineer, is mourned by many around the globe.

College years

Born in Montana, Rob Milne attended the Massachusetts Institute of Technology on an Army scholarship, where he worked with Mitch Marcus on a natural language deterministic-parsing project. Already an accomplished mountaineer, he taught a rock-climbing class at MIT. Milne graduated with a BSc in electrical engineering and computer science in 1978. He moved to Scotland in fall 1978 to pursue a PhD in AI at the University of Edinburgh under Alan Bundy’s supervision. There, he worked on Bundy’s Mecho Project. “This early and influential project,” explains Nigel Shadbolt, a fellow AI doctoral student and now a University of Southampton professor, “had the aim of solving high school mathematics problems [by going] from the problem written in text to a solution using only AI techniques.” Milne further developed the natural-language-processing work he began at MIT. “Rob characteristically tackled the problem with enthusiasm, extreme focus, and determination. And, as in so much of what he did, out of our cohorts he was one of the first to submit his thesis,” says Shadbolt. Milne earned his PhD in 1983.

“Whilst at Edinburgh,” continues Shadbolt, “we all became aware of his other passion for climbing. In common with many others, I could scarcely believe the energy he displayed here too. Whilst many of us were hunkering down for a bit of inclement Scottish weather, Rob was heading out cheerfully telling us he was off for a weekend of ice climbing in conditions of extreme discomfort—a big smile on his face.”

Bringing AI to the military

Milne returned to the US to serve in the military. From 1982 to 1985, he was assistant professor of electrical engineering at the US Air Force Institute of Technology. While there, he founded the Wright-Patterson Air Force Base AI program; developed a masters-level AI program, short courses in AI, and research projects; and consulted on many Army and Air Force AI activities. He shared an office with another applied AI trailblazer, Stephen Cross, now a vice president of the Georgia Institute of Technology and the director of the Georgia Tech Research Institute.

“There was a lot of hype about expert systems then,” recalls Cross. “A lot of Rob’s contributions were helping people understand the right applications for AI, and bounding expectations. Rob was one of the first people to show appropriate uses of AI. He was one of the most competent people I ever met and a great guy to work with. He never saw anything as insurmountable and pushed everyone around him in friendly competition—like who could write a conference paper the fastest. He got me to do more than I thought I was capable of doing.”

In January 1985, at age 29, Milne headed to the Pentagon as chief AI scientist. There he founded the US Army AI Center (now the Chief Technology Office), established an applications development center, briefed senior Army officers on the prospects for AI, and consulted on many AI activities at a time when the US Defense Department was starting to reap the harvest from its years of investment in AI.

Benjamin Kuipers, a professor at University of Texas at Austin, met Milne during this time. They shared research interests. “Rob’s major contribution to AI was to think deeply and carefully about what is needed to apply AI to problems in the real world,” says Kuipers, “and then to show what it takes to make that happen in practice. In the rush of enthusiasm for rule-based expert systems, the field of qualitative reasoning and model-based reasoning recognized that associative rules were not enough: to do high-quality reason-
ing about real-world systems, we needed methods that can build, simulate, and use models of various kinds, to reason about how things work. Rob was a very strong proponent of this position, especially from a highly informed applications perspective."

**AI entrepreneur**

In 1986, Milne returned to the UK. “He set about establishing a company that could bridge the gap between AI theory and practice,” explains Nigel Shadbolt. “Intelligent Applications Ltd. became one of the early success stories in deploying knowledge-intensive applications in industry. The Tiger system became the standard for expert monitoring, analysis, and diagnosis in large gas turbine installations.” Milne’s company received national and international recognition, including the Queen’s Award for Technology. IA is also among the few surviving AI companies from that period.

From the time he founded IA, Milne was actively involved, identifying candidate applications, conceptualizing solutions, directing software development, and ensuring application delivery. He developed the idea for Tiger and led its development and commercialization. Tiger—software with bundled customization consulting services—is now in use at 63 sites worldwide. Milne sold his company of 10 employees to Sermatech Power Solutions in 2000, retaining his position as managing director.

“Rob was one of those rare individuals who could span the academic and industrial worlds with ease,” observes Shadbolt. Bridging both worlds, Milne was able to transfer technology from academia to industry, according to colleague Agnar Aamodt, AI professor at the Norwegian University of Science and Technology. He did this “in a very credible manner since he was an academic with a lot of knowledge and experience from industry. Hence he was highly respected both in academia and industry. There are not many people that can be said about.”

**Community leader**

Community service was an integral part of Milne’s life. He was a tireless volunteer. While in the military, he founded a local SIGART chapter and volunteered for the local fire and ambulance service. He served on the organizing committee of 37 AI conferences (both national and international), sat on five AI journal editorial boards, was elected a fellow of the Royal Society of Edinburgh, was president of the European Coordinating Committee for Artificial Intelligence, and was chairman or treasurer of numerous AI and computer organizations. He was one of the main architects of the successful bid to host the 2005 International Joint Conference on Artificial Intelligence at Edinburgh. He was also active with the Scottish Mountainaineering Club and local pony clubs.

In true form, even while climbing Everest, Milne was working in several spheres. He was raising funds for Care for the Wild International to support its work protecting tigers. He was also conducting three experiments for his Royal Society of Edinburgh colleagues:

- experimenting with new computer communications and reporting technologies (for example, a Web site and blogging) in support of extreme environments and emergency response (the I-Ex technologies developed by Austin Tate’s team at the University of Edinburgh),
- collecting plant (primula) specimens, and
- measuring metabolic rates by drinking an isotope-laced liquid and seeing how quickly it flushed out of his body.

**At the top of the world**

“Rob really was universally liked … and always able to get you thinking in a way you might not have imagined,” remembers Nigel Shadbolt. “At the Acapulco IJCAI two years ago he told me about his plans for Everest. … He said how much it meant to him.”

“Rob was an enthusiast in all he did,” says Austin Tate, a friend and colleague of Rob’s for over 20 years. Alan Bundy adds, “People with ambition, persistence, and tenacity are often difficult to get on with. Not so Rob. He was one of the nicest people it has been my pleasure to work with. Val, his wife, said in a radio interview that ‘Rob died at the top doing what he loved most.’ This was true in all the spheres of his life.”

“What I really remember is Rob’s spirit,” recalls Ben Kuipers, “combining cheerfulness, a fine sense of humor, an eagerness for the next challenge, and a really essential goodness. … He saw each success as a step toward other challenges, which he looked forward to. He looked for, saw, and brought out the best in the other people around him.

“He should have had another three, four, five decades. But he left us at the top of the world, and at the top of the world is where he liked to be.”

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