Three Anecdotes from the DARPA Autonomous Land Vehicle Project

Dan Shapiro

The DARPA Autonomous Land Vehicle (ALV) was a 12-foot tall, eight-wheeled robot with multiple sensors, tasked to go from point A to point B without human intervention in the hills outside of Denver in about 1985. This was a large applied research effort that presented many opportunities for unusual experiences.

In one such experience, I was called in, at the last minute, to help improve our ALV proposal. The proposal was a 300-page document that segued smoothly from problem description to corporate capabilities and managerial plan, omitting any mention of technical approach. This taught me a rule of thumb I have seen validated many times: the larger the project (in dollars and scope), the poorer the technical proposal.

In a second experience, I was demonstrating a dynamic programming algorithm at a quarterly review. The algorithm found minimum time paths from all points to a goal, set in an open field. I clicked a starting point, and the system traced a route that detoured to use a nearby road. I clicked closer to the goal, and the detour was more pronounced. When I clicked right next to the goal, the optimal path was horribly convoluted—it went away from the goal and to a road, which it followed around a long hogback ridge before departing cross-country for the objective. I had to offer the sponsor something by way of explanation, so I looked at him and said, "We just spent $200,000 of your money to learn that roads are a good idea."

A third experience occured when I was at the computer, writing code for a new route-planning algorithm. A senior manager and a vice president of the firm came in, so I told them what I was doing. One said, "make it more AI-like," while the other wanted "a more engineering approach." That goal conflict literally ran backwards from my fingertips, through my corporate management, and into DARPA, where they were debating the same question. The resolution pushed the ALV project in the applied direction and influenced later DARPA efforts.

Daniel Shapiro (dgs at stanford.edu) is the executive director of the Institute for the Study of Learning and Expertise (ISLE), and president of Applied Reactivity, Inc. (ARi).