

Afterword

If you've followed me this far, you might agree that we've come through some rough country. Still, I'm of the opinion that hard-won knowledge is the best knowledge, not only because it sticks to you better, but also because winning a hard race makes it easier to win the next one.

This is an unusual book in that sense: In addition to being a compilation of much of what I know about fast computer graphics, it is a journal recording some of the process by which I discovered and refined that knowledge. I didn't just sit down one day to write this book—I wrote it over a period of years and published its component parts in many places. It is a journal of my successes and frustrations, with side glances of my life as it happened along the way.

And there is yet another remarkable thing about this book: You, the reader, helped me write it. Perhaps not you personally, but many people who have read my articles and columns over the years sent me notes asking me questions, suggesting improvements (occasionally by daring me to beat them at the code performance game!) or sometimes just dumping remarkable code into my lap. Where it seemed appropriate, I dropped in the code and sometimes even the words of my correspondents, and the book is much the richer for it.

Here and there, I learned things that had nothing at all to do with fast graphics.

For example: I'm not a doomsayer who thinks American education lags hopelessly behind the rest of the Western world, but now and then something happens that makes me wonder. Some time back, I received a letter from one Melvyn J. Lafitte requesting that I spend some time in my columns describing fast 3-D animation techniques. Melvyn hoped that I would be so kind as to discuss, among other things, hidden surface removal and perspective projection, performed in real time, of course, and preferably in Mode X. Sound familiar?

Melvyn shared with me a hidden surface approach that he had developed. His technique involved defining polygon vertices in clockwise order, as viewed from the visible side. Then, he explained, one can use the cross-product equations found in any math book to determine which way the perpendicular to the polygon is pointing. Better yet, he pointed out, it's necessary to calculate only the Z component of the perpendicular, and only the sign of the Z component need actually be tested.

What Melvyn described is, of course, backface removal, a key hidden-surface technique that I used heavily in X-Sharp. In general, other hidden surface techniques must be used in conjunction with backface removal, but backface removal is nonetheless important and highly efficient. Simply put, Melvyn had devised for himself one of the fundamental techniques of 3-D drawing.

Melvyn lives in Moens, France. At the time he wrote me, Melvyn was 17 years old. Try to imagine any American 17-year-old of your acquaintance inventing backface removal. Try to imagine any teenager you know even using the phrase “the cross-product equations found in any math book.” Not to mention that Melvyn was able to write a highly technical letter in English; and if Melvyn’s English was something less than flawless, it was perfectly understandable, and, in my experience, vastly better than an average, or even well-educated, American’s French. Please understand, I believe we Americans excel in a wide variety of ways, but I worry that when it comes to math and foreign languages, we are becoming a nation of *têtes de pomme de terre*.

Maybe I worry too much. If the glass is half empty, well, it’s also half full. Plainly, something I wrote inspired Melvyn to do something that is wonderful, whether he realizes it or not. And it has been tremendously gratifying to sense in the letters I have received the same feeling of remarkably smart people going out there and doing amazing things just for the sheer unadulterated fun of it.

I don’t think I’m exaggerating too much (well, maybe a little) when I say that this sort of fun is what I live for. I’m glad to see that so many of you share that same passion.

Good luck. Thank you for your input, your code, and all your kind words. Don’t be afraid to attempt the impossible. Simply knowing what is impossible is useful knowledge—and you may well find, in the wake of some unexpected success, that not half of the things we call impossible have any right at all to wear the label.

—Michael Abrash