



The Learning Project

by Lincoln Stoller

Andrew Reece Crowe: Student, Computer Science

Interviewed in Carrollton, Georgia. October 13th, 2006.

Born: 1989 in Gainesville, Georgia

“Though I did not cease to esteem the studies of the schools, I began to think that I had given enough time to languages, enough also to ancient books, their stories and their fables... Therefore, I entirely gave up the study of letters and employed the rest of my youth in traveling, being resolved to seek no other science than that which I might find within myself, or in the great Book of the World.”

— René Descartes, *Discourse on Method*, 1637

Our understanding of the world we experience is proportional to our having experiences of the world given the views we hold, multiplied by the merit of those views.

— *Restatement of Bayes' fundamental theorem and the marginalization condition of probability, adapted from "Data Analysis, A Bayesian Tutorial", by D. S. Sivia, Oxford, 2004, p.4*

AC:

I tend to have a lot of people who are interested in me. I honestly don't know why, but I do. I seem to be the kind of person who people know my name.

Because of that they'll all ask me questions about what do you want to do? It's convenient to come up with a simple answer rather than getting into a long discussion, so I respond by saying, "I want to become a computer programmer." It's an oversimplification, but it's convenient.

LS:

What lead to your interest in computers?

AC:

Both my parents are accountants who ran their own business, my father is retired and my mother works part time. Because of that my parents would still be working after school was over. So I ended up watching a lot of the history channel when I was younger. I should also mention that I'm an only child.

From 5 o'clock onwards the History Channel showed this program called "Our Century," which was World War II footage. That's all it was and it really interested me. I got to the point where I could identify when they reused the same clips in different battles. It's kind of funny actually, I don't know how they got away with it.

I also played computer strategy games. I wasn't very good but I was young and I just set the computer to the easy setting. I was interested in facts and I absorbed them kind of like a sponge.



As I got older I got interested in why things happened, not just military history and the engineering aspect of it, but also the political aspects of it. I became less interested in facts and more interested in the reasons behind things.

Early in high school I got into thinking about morality, and I'm still into it. I'll sit around and try to think about where contemporary morals come from and why they exist. What the real morals are versus what the stated morals are. You can say anything you want, but when push comes to shove things start to move around a little.

I got interested in the idea that complicated systems arise from simple forces. The idea that you can have a small number of basic forces that build upon themselves to form something complicated. You have the old story,

For want of a nail the shoe was lost.
For want of a shoe the horse was lost.
For want of a horse the rider was lost.
For want of a rider the battle was lost.
For want of a battle the kingdom was lost.

This summer I took a course on abnormal psychology here at the University of West Georgia. Our professor was interested in how a person can express themselves in seemingly strange ways that have deep significance just to them. Psychology can be a different lens to look at the same thing, but what I'm hoping is that if I can combine enough perspectives I'll have a better view of the complicated systems around me.

That's actually why I'm interested in computer science. I've come to the conclusion that I won't live long enough to learn all of the math and all of the special formulas I would need to become as good as I would like to be in every one of those areas. But if I can learn to use the modeling and processing powers of the computer, then I can get a better idea of how things work.

LS:

You've talked about methods of getting perspective, getting a handle on the computations, but what really draws you? What's the underlying motivation?

AC:

I think a lot of it is curiosity. I'm really interested in how humans as a whole got to the point where we are, and how we could get to other places. How societies develop.

I've always had this interest in history, probably because I saw so much of it when I was younger, I always like to trace how events years and years ago would lead towards things happening now.

In some way it's my own weird way of answering "why are we here?" I'm interested in why are we here at this position, what events led us here, and where we are going.

Oddly enough it was a video game that got me interested in more serious books. My step-brother gave me a copy of the game "Red Alert" in which this scientist goes back in time, removes Hitler and creates this alternate history. But without another power to block him Stalin tends to take over, which may be another one of those reminders that small changes, even large changes, don't always work out the way you'd expect.



The company that made that game also made the game “Dune”. I’d never heard of the Dune series of books, but another student started reading it so I checked it out of the library. I got into science fiction because of that, and then I migrated into the works of Robert A. Heinlein.

Heinlein talks a lot about morals. His morals are extremely practical. That made me start wondering a little more. Many of our morals make a lot of sense when you look at them for economic reasons, more so than just thinking of them as basic rules like, “You should do this or you’re bad.” For example, why is stealing wrong? The economic reason would be because it diverts a large amount of the economy towards security, that makes it inefficient. As a result, a culture in which stealing is rampant will have a lower standard of living.

When I started looking at why those things happened I was better prepared to reconsider the history that I’d learned. As I developed mentally — and I still do this to some degree — I come back to things I’ve done before and I find I have gotten better at them. I got better at games not necessarily because of practice but because I’m better at multi-tasking and thinking strategically. I’m also learning new ways to approach problems.

I think that’s sort of what happened to some the questions that I’d had as a kid — the WWII histories and the other histories that I’d looked at — they kind of got jumbled in with the moral discussion. I got interested in how history flows, and why things have ended up this way.

LS:

The kind of stuff you’re telling me is a very mature and cerebral, but it seems too neat and orderly to believe. Where did this neat and orderly interest come from?

Here you’re telling me, “My life was an attempt to order the influences of history, logic and humanity.” But what about these other things that kids do at this age: socializing, schoolwork, and just hanging out? How did you develop beyond these other things, with which most kids are overwhelmed?

AC:

I’d say that the stuff I was mentioning to you was more gaps between the other stuff that kids normally do. I hit my lazy senior stage at 10th grade in high school. I think that’s when laziness seeped in. I do a fair bit of procrastination and time-wasting, which is a much-vaunted pastime of anyone my age.

Part of my problem is that the practical application of the things that I’ve been talking about happens in business or government, and I don’t have many opportunities to partake in these things. I’m now a computer science research assistant, but what I tend to do for fun is play video games

I still play a lot of strategy-type games. The space ones: I build up my little empire and lead it through its technical evolution. The games I enjoy the most are the ones where I get to see a change, something in the game where I’ve started with one thing and I build it up into something else. What interests me is seeing how your little culture grows.



LS:

Go back to the accelerated reader program.

AC:

They got us to read a lot in elementary school because of that program. You've probably already guessed how it works: you read a book that's been assigned a point value. Then you take a test on it in order to win points. When you get to a certain number of points you get a prize. I got a gazillion points because the Hardy Boys books were 5 points each and I could read one in a day and take the test.

LS:

You had to take a test to get the points?

AC:

Yeah, you had to take like a little 10-question quiz so that you couldn't fake it.

LS:

Did you get good scores?

AC:

Usually. The only one I scored badly on was "Moby Dick." I may have read that book when I was too young, but also Captain Ahab talks to himself and can't tell if he's talking to himself or someone else. It's terrible: you sit there and read a page, and then you have to go back and read it again!

LS:

Well, he didn't write that book for its testability!

AC:

That's true, I noticed that! (Laughs) I don't know if they expected many people to be taking an accelerated reader test on it. I probably wouldn't have except for it had a massive point score attached to it.

Strangely enough the hardest tests were tiny nonfiction books. Because they were tiny they expected you to remember the specifics. We also had a bunch of old cold-war books that were interesting because they were partially strategy books, and then they had facts, like comparing the performance of an Apache helicopter compare to a Hinde, and then they'd show big old diagrams of how navel amphibious units worked.

LS:

It's funny; I'm trying to corral you to talk about how you developed, but it always comes back to what you were thinking. It seems that things would catch your imagination and you would make them into these projects. Where did you get your books? Was someone helping you find them?

AC:

I usually found them myself, and I was a really picky reader. I was in a good a position because



I scored so high. They actually tried to limit kids to what they thought was appropriate to your reading level. Since I scored so high I could read anything in the library. That's how I got into some of the weird books.

I wouldn't say I was as active as I'm making it sound, it's just that looking back... it's difficult to determine when you came to certain realizations. Something was happening, but it was much more behind-the-scenes. I didn't start to realize a lot of things until 8th grade. I got smarter in 8th grade, I can actually tell, it's quite interesting.

Looking back it seems that I was moving somewhere at a pretty good rate through middle school. High school is where I stopped.

LS:

Stopped?

AC:

I wasn't really challenged by classes in high school. When I got to high school I slowed down, I'm not entirely sure why. Part of it was that I wasn't doing as much in school, but even outside school I was doing less.

LS:

What were you doing?

AC:

In 9th grade I got into deeper books. I got into Heinlein's "Stranger in a Strange Land". I was bored at TIP — Duke's Talent Identification Program — and my roommate was taking a Science of Science Fiction class. I was there the summer after 8th grade. 8th grade was when I took an economics course there, which was also interesting.

LS:

Wait, you're 13 and they're sending you away to a sleep-over thing at Duke University? Isn't that, like, intense for a young kid to go away and live in a dorm room?

AC:

It didn't really bother me. All of us were together and we were all the same age. Before that I had been involved some in Boy Scouts, and I'd done some hiking and some overnight stuff. I'd gone to a lot of day camps when I was younger, so it really wasn't that big of a deal. Plus at TIP they keep you perhaps too busy, they have mandatory fun. They'd have these evening programs and you'd have to go.

I didn't think to bring anything to read and my roommate had brought "Starship Troopers", which is one of Heinlein's books. I read it and kind of liked it and that's how I stumbled on "Stranger in a Strange Land".

LS:

So to boil it down to one main influence, it sounds like books were the thing.



AC:

Books were a large part. Books introduced me to ideas that I wouldn't otherwise have gotten. I would never have been exposed in high school to the things that I was ready for. With books I jumped ahead. I read "Lord of the Rings" in 4th grade because it had a whole bunch of accelerated reader points. I found out later that "Stranger in a Strange Land" was a really big thing on college campuses.

LS:

None of the stuff you're telling me has a teacher in it, or an adult, or a mentor, or even a club. Was it your own idea to get carried away with all this reading?

AC:

Well, yes and no. I probably wouldn't have gotten into it except that the accelerated reading program was a big thing in school at the time. It was kind expected, they wanted you either reading or in the library getting a book.

I read fast and remembered a lot. I have this really weird thing — it's true for a lot of things — the way I learn is I accumulate this massive store of data and then I try to figure out how it works. That's what happened there.

Once I knew enough words to understand what I was reading my comprehension jumped from nothing — maybe it was in 3rd grade, I know it was in 4th grade — to testing at 13th grade level.

LS:

It's interesting that you start out saying you're interested in computer science, yet all that we've talked about is verbal stuff.

AC:

There's this weird thing: I can't make an 800 on the SAT Math test (800 is the highest score - Ed). I don't know why but I've made an 800 on the Verbal test twice!

LS:

So in spite of your interest in reading, you now shifted your interest to computers.

AC:

I've always liked technology. I've always been interested in the engineering side of things, and that kind of carried on to computers because that's what I had my hands on. Like I had a computer at home so I'd be doing games on it, and doing my homework on it.

LS:

It's one thing to enjoy using computers, and it's another thing to devote your life to computer science, a lot of which doesn't have to do with using computers but with studying them. How did computers end up being the thing you wanted to focus on?

AC:



I've had two computer courses here and I've enjoyed both of them. It's one of the few things that I could see myself doing as a career, although I don't necessarily want to do just a single thing as a career.

I'm more interested in applying the computer to solve practical problems, and you can work on a lot of problems if you can simplify them to some computer form.

What am I trying to say here? I'm really interested in modeling and in the practical benefits of computers. I like the way that computers solve problems, and I suspect that some computer techniques, like genetic algorithms, could be used to solve a lot more complex problems than we use them for now.

I've become convinced that a lot of really complicated events come up through small changes. Computers are really good at taking a small operation and extrapolating, and I suspect that if you utilize a computer's ability to simulate small changes in complicated systems, then you could gain a lot of understanding in a lot of different fields.

I try to steal a little bit from random subjects (Laughs) — a little bit of psychology, a little bit of game theory — and work it all together into something that I could put on a computer.

I intend to come out from college with a degree where I can actually get a job. Both my parents say — and I agree with them — that you want to have a plan in case your dream solution doesn't come through. There are a lot of things that you can do with computers that businesses will pay a lot of money for.

They don't really offer any degrees in what I want to do, which is a problem that a lot of people have. I'm interested in a kind of general area that will give me the background to move into a lot of different things. But there are only so many majors and minor that you can get!

LS:

I'm not really a great supporter of the whole college approach. It may come as a surprise to a lot of college students that their success after college will have little to do with their success in college.

In a job interview, for example, people are going to look at you and, as business people learn to do, they'll read your future in the way you carry yourself, the way you speak, and the way you focus yourself. They'll match what they see in you with the kind of person they're looking for. They're not perfect at this, in fact they're often poor at it, but nevertheless evaluating people is what one learns to do in the business world.

AC:

It's not the best way to do it... it's just better than any other way of doing it.

LS:

That's right!

AC:



Now they're working on computer systems that analyze all the variables and come out with some prediction about how people behave...

LS:

... If that program does as bad a job as people do, then we're in for it!

AC:

... They got mixed results, sometimes it works and sometimes it doesn't!

LS:

... The nightmares of science fiction will someday come to pass.

AC:

... Computer's have this weird tendency, they'll find some really obscure relationship that no one would have ever thought of and it will turn out to work, and they'll miss the completely obvious thing that any person could see!

LS:

Well, my point is much of a college graduate's future is determined by what they've accomplished and what skills they've learned, not by how well they performed according to their school's ranking system. Your work speaks for itself, and one thing colleges never seem to teach people is how to convince other people of the value of what they've accomplished.

AC:

I've always thought, and I still think, that the biggest advantage of going to a place like The Academy isn't the courses you're taking, it's the people you're around. The discussions you have and things.

LS:

My attitude to all structured learning is that you've got to invent it yourself. When I come back to places like this I think, "Boy, look at these old college farts sitting around studying things like geology!"

AC:

My roommate loves geology! (Laughs)

LS:

Yeah, then he should go to the mountains! What's he doing sitting in a room studying a book?! (Laughs)

I resonated with something you had said earlier. You said that you liked to understand how things got to how they are. I think that means a lot. That may sound too simple to be an explanation for anything but, in fact, it's enough to motivate a lot of people.



AC:

That and just proving other people wrong. Those two things seem to get a lot of stuff done!