



Sloan Career Cornerstone Center

Profiles of Electrical Engineers and Computer Scientists



Daniel D. Holt

**Electrical Engineer
Genetronics Inc.
San Diego, CA**

Education:

B.S. - Electrical Engineering, San Diego State University

Job Description:

Electrical Engineer working within the fields of Electrofusion and Electrochemotherapy.

Advice to Students:

"Students should seek out practical experience while they are still in school. Work on projects sponsored by their schools, professional organizations, or clubs."

Video Transcript 1:

"I have had the opportunity to, to bounce around in a small company. I don't have one thankless little task to work with. I have all these different opportunities and different technologies I get to work with. The fact that I get to go from, from one type of hands-on technical to in front of a computer for a week designing or drafting a circuit board and the next week doing programming, the next week back out on, on the bench working on the actual product again. As opposed to just one task, the small company gives you that much more global feel where you don't; not that you don't know where you're going next, but there's an excitement there that you don't have to worry from day to day that oh, I've got to go back and do the same thing."

Interview:

When Daniel Holt began working, he was amazed at the difference between engineering at school and the real world of engineering. Holt works at a small company, Genetronics, where he has had the opportunity to debug boards, do surface mounts, do circuit board layout, design Powell programs, and program an operating system. He thrives on the variety, but would have liked school to prepare him for the working world. During his undergraduate years, he says, "I kind of felt that engineering was a bunch of math: it was equations; it was formulas. Out here, I've done very little of what felt like day to day work as a student."

Holt gives several examples of the differences he discovered. "Coming out here, you're given a board. You're not given a piece of paper with numbers on it. You're given an actual product

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and asked to solder it and asked to find a problem in that device." He describes the difference in magnitude between projects done at school and those in the real world. He explains that one particular product "was a very large device compared to anything I had learned in school. I had learned very small, 16 gate devices. This device has well over a hundred internal gates. Pin count is much higher than anything the school ever taught. But the fundamentals were still there, and knowing them from school was the only reason I could even attempt doing" the project.

Another aspect of work that is not taught at school is the importance of documentation. "We go weeks at a time working on a program's documentation, and documentation is one of the biggest aspects of engineering that is described so little in school that you never realize that you're going to get out here and be in front of a computer and probably a word processor as an electrical engineer for so much of your time. They don't stress enough the fact that you need to be a good writer the fact that you need to be able to take something that you've worked on and put it on paper so that someone else, who is non-technical, can understand what you're talking about."

Holt strongly recommends that students seek out practical experience while they are still in school. He tells students to work on projects sponsored by their schools, professional organizations, or clubs. They can also work on their own independent projects, "doing something completely on the outside that gives you the experience of actually purchasing parts, building a board, designing, laying out a circuit board all the way to the point of actually making sure your design does what you expect and having a worthwhile product when you're done."

In his own case, Holt took a project he had developed to his interview at Genetronics. "We spent two hours during the interview discussing my product. And he, my boss now, could ask me any question about the schematic, the circuit board, any of the components. And I was able to answer every question about every little detail simply because it was my device and I had spent months in developing it." Having a specific project to discuss at an interview gives a candidate a decided advantage.

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