

She also fondly remembers her friends on campus, “who made me a very happy student.”

“At GE I have learned to merge analytical and academic knowledge I gained at Caltech with more practical and experience-based knowledge gained through my first few years here. Perhaps the only thing I wish I

had had more experience with while at Caltech is more exposure to the practical considerations of manufacturing, such as making successful and safe aircraft engines. I have had to learn many of these things as I go.”

Leyva feels the years she spent at Caltech “are some of the best in

my life. I’m grateful to the GAL-CIT community who made me feel like a family member. I hope that through my work and citizenship I make them proud.”   

Eric Garen: Education at the Fore

Electrical Engineering, BS '68

What are the pivotal experiences that shape a person's life, that lead him or her down one path rather than another? We spoke to Eric Garen in his Los Angeles home about these experiences, about his Caltech education, about the formation of his company, Learning Tree International, and about his current projects. What emerged is a picture of someone who has successfully applied a rigorous, analytical approach to problem solving, whether it be of complex business problems, or of social problems that plague inner-city youth trying to make their way to college.

We begin in the early 1970s, on the eve of the advent of the personal computer. Intel was manufacturing their early microprocessors (the 4004 and the 8008), and engineers were struggling with how to use these new devices. Eric Garen was one of those engineers.

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fter graduating from Caltech in 1968, I went to work at Technology Service Corporation, a small think tank in Santa Monica that was an offshoot of Rand. After a few years, I began to incorporate minicomputers and then microprocessors in the real-time radar simulators we were designing and building. But learning how to use the early minicomputers and Intel's first microprocessors was basically a trial-and-error process. You made a lot of mistakes and did things the wrong way. It became clear that that wasn't the best way to learn. So I joined with fellow engineer and Stanford graduate Dr. David Collins to form a company

that would train other engineers like ourselves on new technology. In 1974 we formed Learning Tree International.

We went into business in Dave's spare bedroom. We used his garage to store our course materials. We were an upscale start-up—we had a bedroom in addition to the traditional garage! We put 20,000 or so flyers describing our first microprocessor course into the mail and sure enough, people started sending us enrollment forms and checks. Initially I was the course developer and instructor, and Dave was the operations department and marketing department. We packed boxes with our course materials (and a few stray autumn leaves) out in the driveway, and



sent them off to course sites. A month after running our first course in Los Angeles, we were running courses on the East Coast and a month after that, in London and Paris.

Learning Tree International offered courses on a global basis right from the start, and as a result, half of their business now is in the U.S. and half is outside, primarily in Europe and Canada. They also have offices in Tokyo and Hong Kong.

Our business concept was to offer courses in new technologies as they were being introduced. Microprocessors formed the first technological wave that propelled our business forward throughout the 1970s. In the 1980s, the networking wave moved us forward, and created needs for training in distributed computing, UNIX, C and data communications. Then in the 1990s, the client-server wave propelled us beyond the engineering departments we were serving and into our customers' information systems groups. And now the Internet wave is pushing us forward again. Today we offer about 150 different courses and have trained over one million IT professionals around the world.

The impact of his Caltech education on his subsequent endeavors was pervasive, but not in the traditional sense of applying the specifics of his electrical engineering background to his work.

My Caltech education provided me with good organizational skills and taught me how to learn. You can't get through Caltech without being reasonably organ-

ized, despite the typical Techer's desire in the mid-'60s, mine included, to appear sort of "laid back." I left Caltech with the ability to apply an analytical, quantitative approach to problems and to make data-based decisions. Because both Dave [Collins] and I are analytical, it's not surprising that our company is highly data driven. We have built systems throughout our organization for collecting and analyzing data. Early on, we realized that we had to start "procedurizing" things, "systematizing" things, if we were to grow the company to any size. Most important were the pro-

ing procedures in place that ensure consistent results. And then having a "meta-procedure" for reviewing and improving our procedures on an on-going basis, so that over time the procedures, and the results, get better and better.

It's really exciting to figure out how you take a seemingly amorphous field like teaching advanced technology, and turn it into a logical, coherent, structured process that ensures that results are consistently achieved. Every course participant evaluates our courses and our instructors, and each year our average instructor GPA gets just a



cedures we developed to ensure the quality of our training, because ultimately that's what drives our growth. After taking our courses, our participants return to work and succeed in their projects because they gain the skills they need. So how do we ensure every attendee at every course succeeds when we're running 8,000 courses a year in 30 countries around the world? The only way we can do that is by hav-

little bit higher. Today, it's running just over 3.82. We still have some room before reaching 4.0, but we're edging ever closer.

In 1956, when Garen's father, a chemical engineer, took a job in the new rocket industry (at Aerojet General), the family relocated from Greenbelt, Maryland to Sacramento, California. A few years later,

the young Garen found himself attending Folsom High School, just down the road from the Folsom Prison that Johnny Cash made famous. In those years, the education there was rather fundamental...

When I got to Caltech, I experienced a rude awakening because I had no calculus or advanced science classes in high school. Dr. [Rochus] Vogt did a terrific job teaching frosh physics that year using the Feynman books. His first lecture with air troughs just blew my mind. It was exciting, but the pace of the lecture, the course, and my entire freshman year were staggering.

I hadn't made up my mind whether to go into biology or engineering. But in freshman physics we were given a problem and told to solve it by writing a computer program for the largest computer on campus, an IBM 7090—most of us had never seen a computer before, much less used one. They gave us a thin FORTRAN manual and said "Go." So there we were, trying to figure out how to compute the trajectory of a rocket traveling from the earth to the moon, and not getting our program, or our rocket, off the ground. My partner and I had to teach ourselves FORTRAN, making one mistake after another. It was an experience that prepared me for my similar encounter with the Intel 4004 microprocessor a few years later. After first fighting our way through seemingly endless syntax errors, we encountered our first programming mistake—putting data into the first

column of the printout and discovering that a 1 in the first column served as a control character that caused the page to eject. Our printout was about a foot and half high, with one row of data per page! Eventually we got our program working. I learned a lot of FORTRAN in the process, and found myself hooked on computer technology. That experience was pivotal. I declared an EE major—and realized that trial and error is really a terrible way to introduce people to computers.

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y second pivotal experience occurred in my senior year. One of my Dabney House friends, Charles Zeller [BS '68], had married the year before. His wife attended Pasadena City College and was taking a modern dance class with a young woman named Nancy Graeber. The Zellers introduced us in the fall of 1967, a week later we went to a Grateful Dead concert, and we've been together since. So you can see I came out of Caltech with much more than just an engineering education!

I think that for me, the greatest thing about Caltech is that it's a concentrated environment where you establish lifelong bonds with people who have similar interests and similar analytical capabilities. It's a phenomenal environment and attracts phenomenal people.

My third pivotal Caltech experience was meeting the guys—yes, it was still all guys in those years—who have become my friends for life. In fact, for the past 11 years, seven or eight of us have had a

reunion each year with our families. It's amazing how much satisfaction we get by sharing some wonderful experiences together each year.

In 2000, Garen and his wife established two scholarships at Caltech specifically for students from very low-income families. In the same vein, they have turned their energies recently to two community programs: One Voice and Bright Prospect.

Several years ago, we began to provide support for One Voice, a grass-roots community service organization in Santa Monica, California. One of their programs identifies high-performing high-school juniors from financially disadvantaged living situations—generally inner-city kids who have proven they are capable of succeeding at top-ranked colleges, but who are unlikely to get there without counseling, support, and complete financial aid. These kids come from high-risk environments, but they are not at-risk youths. These are young people who have overcome huge obstacles and done very well in high school through their own talent and determination.

One Voice counsels them, prepares them for their SAT tests, guides them on their college essays, gets recruiters from top universities to interview them, helps them decide on a list of schools, and structures their application process. As a result, every student in the program gets admitted to top schools, and receives full tuition and room-and-board packages from them. One Voice then provides

supplemental funds for airfare, clothing, books, and living expenses.

This whole area has troubled me for a long time: we have in our very affluent society a significant fraction of our population that is economically disenfranchised. And that gap, if anything, seems to be widening. That cannot be a stable situation and we need to do something about it. So this seemed to be a small step in the right direction of helping to create a path out of that environment for kids who at least have the gumption to go that path. When these kids succeed, they inspire more and more kids to follow. And who knows, at some point, it may actually start to steer the direction of the boat differently than it's going now.

The One Voice program has been extraordinarily successful—they have had over 120 students in their program and only one has dropped out. And of the kids who have graduated, close to 40% have gone on to graduate school. They have students doing graduate work at MIT. They have students in medical school at Stanford. They've graduated their first lawyer who passed his bar exam on the first shot.

Nancy and I sat down with the directors from One Voice a few years ago and said, we're helping 20, 25 kids a year. But is it scaleable? Could this be 200 kids or 2,000 kids a year? That encounter led us to incorporate a new non-profit organization located in Pomona [California] called Bright Prospect Scholar Support Program whose mission is to replicate the One Voice program, and then spread it to other communities. Bright Prospect has implemented exactly the processes that One Voice uses, because in business I've learned that when you find a

process that's successful, you need to document it, replicate it, and only slowly make incremental changes to improve it.

Last spring we identified our first group of 12 kids. This past fall, recruiters from 30 top colleges visited Bright Prospect to meet our students, and soon we'll know where these students will be going to college.



Other programs that have attempted to help students from similar situations often experience a 50% or greater drop-out rate. This is not because the students don't have the academic or intellectual capability. It's simply a culture shock. They're being plopped down in an environment that's alien and that they don't feel a part of. So the support organization must stay with the students: by e-mail, by telephone, by personal visits, by intervening, by calling up the dean if necessary.

Bright Prospect's goal is to replicate the One Voice program successfully, and to raise sufficient funding to make the program self-sustaining. That will free up our seed capital and allow us to go out and replicate the program in other locations, either by opening more Bright Prospect offices or by finding other community service organizations that want to add this program to their activities. That's the vision. In ten years, we would like to have at least 1,000 students in our program, 200 students at each grade level. That's a modest goal, but one we are determined to achieve. And we hope to make it a lot bigger than that.

While Garen spoke in detail about the formation of his company and the creation of

Bright Prospect, he also touched briefly on family life as our interview drew to a close. He and Nancy have two children, a daughter, Nicole, and a son, Steven. He noted (with a smile) that taking his daughter to college was just not the same as when he went off to Caltech.

Taking our daughter to college was a whole different experience than I remember from arriving at Caltech. Nicole entered Washington University in St. Louis last August as a double major in pre-med and fine arts. Helping her move in, I felt like a rock band roadie. We practically needed a bus and four semis to get everything to her dorm room... well, I suppose that's a bit of an exaggeration, but Nicole has a little refrigerator. A microwave. Computers, printers... I just showed up in Pasadena with one suitcase and a manual typewriter.

Our son, Steven, is a junior at Harvard Westlake High School and like his sister, he's good at both art and academics. Steven plays guitar in a band—they're quite good and play at the Roxy and the Whiskey on Sunset Boulevard. But they change their name so often I am not sure what they are called this week. Maybe my roadie experience will come in handy again one day when they go on tour.

A terrific wife who I met at Caltech. Great kids. Lifelong Caltech friends. Applying what I learned at Caltech to make a difference in peoples' lives. What more could one hope for from a Caltech education? **ENG**