

Ephraim Garcia

June 14, 1963 - September 10, 2014



At the time of his passing, Professor Ephraim Garcia was described as a “gregarious” colleague.

If you look up what gregarious means you get a few synonyms that accurately describe how Ephraim was as both a friend and a colleague to many: “sociable,” “company-loving,” “friendly,” “affable,” my favorite “informal chummy,” and “warm.” He was the kind of guy who would address you by your last name in that “we’re good buddies” kind of a way. His friendly and outgoing nature is what led him to become an informal mentor to so many of his junior colleagues. His engaging nature meant that many of the discussions one would have with him were long and drawn out, but they were always, or at least usually, valuable. Nearly everyone can remember Ephraim pacing outside his office waiting to engage someone in a conversation about some new idea and application of mechanics and electronics. While always a proponent of new ideas, much of his advice tended to revolve around focusing on those things that were important to you (both professionally and personally). If building up a particular part of your research program was important to you, do that. If starting a business was important to you, do that. Don’t do things because you believe other people think they are important.

Ephraim Garcia was born in Manhattan to Cuban refugees Ephraim and Zenaida Garcia. Like many first generation Americans, he had very strong feelings about his new country that were reflected not only in his academic research but also in the obligations he eventually assumed to enhance the nation’s security. In addition to being a Professor, he worked as a program manager at the Defense Advanced Research Projects Agency (DARPA) and as a consultant to the CIA. At 30, Ephraim was diagnosed with cardiomyopathy, and realized he would not live a normal life span. Most of us did not know of this diagnosis, which likely shaped his larger than life personality. He was determined to make the time he had productive. And he did that, he lived every day fully.

He earned his B.S., M.S., and Ph.D., all in Aerospace Engineering, at the State University of New York at Buffalo. After finishing his Ph.D. in 1990, he spent a year as a research associate at the U.S. Air Force Academy, and then a year in the same capacity at the Air

Force Phillips Laboratory. In 1991 Ephraim accepted a position as an Assistant Professor of Mechanical Engineering at Vanderbilt University and shortly after in 1994 he obtained tenure and was promoted to associate professor. From 1998-2002 he took a leave from his position at Vanderbilt to serve as a program manager at DARPA. Finally in 2002, he joined the Cornell faculty as Associate Professor of Mechanical and Aerospace Engineering and was promoted to Full Professor in 2011. From 1990 to 1997, he was also the principal of Garman Systems, Inc., a small high technology consulting company in Nashville, Tennessee, which was eventually sold to another company in Franklin, Tennessee.

At DARPA, Ephraim developed and managed four programs with a total funding of around \$218 million. These programs all dealt with defense and intelligence issues, but of course had civilian applications. One of these, the “Exoskeletons For Human Performance Augmentation Program” was focused on developing an integrated approach to power, actuation, control, and the man-machine interface. The goals were to generate new capabilities for ground forces. This technology also has applications to devices to enable mobility for amputees. These uses have now been advanced to a remarkable degree.

Engaging, creative, inquisitive, scholarly, combative, respectful of older colleagues, proud to be a member of the Cornell faculty and of the Sibley School faculty, Ephraim taught students the intersection of Physics and the Art of Engineering and Engineering as both a creative and competitive endeavor. He was demanding and wanted students to strive for quality. He would withdraw a team from national competition if they were not at their best. Ephraim believed that modern engineers could learn from past generations. He often kept models of ingenious mechanisms of the Reuleaux collection on his desk to inspire new applications

His research was very diverse, but centered around “smart” structures (which can adapt and be reconfigured by actuator control or automatically by sensing temperature, stress, or some other characteristic of its state), control engineering, flight characteristics of unmanned flying vehicles, and generally the design and analysis of mechanical systems. Ephraim established the Laboratory for Intelligent Machine Systems that explored this fascinating field and its applications to aerospace structural systems, energetics, bio-inspired robotics, and precision motion controls. The types of research projects that most appealed to Ephraim were those that were somewhere between a little far flung and very far flung, but had the potential to be incredibly impactful. In particular, he was very excited about projects that could use mechanical systems to augment biological ones and vice versa. This fascination is easily understood by looking back to his days at DARPA where he founded the “Exoskeletons for Human Performance Augmentation Program” and more recently to his days at Cornell where he worked on a number of projects including those entitled “Insect Cyborgs” and “Lab-on-a-Bird.”

Perhaps it comes with experience, but Ephraim was particularly good at putting people at ease and maintaining calm in stressful situations. A specific example was before a DARPA

program meeting in Hawaii at which the team had to give a presentation on its approach to a particular project. Millions of dollars were on the line. The rest of the team was freaking out in the hotel room trying to get the presentation together, worrying about how others weren't sending us their stuff, etc. Ephraim was never worried, confident the team would perform well when the time came, walking around the hotel room wondering if we have to pay for the in room coffee. Of course, come show time, everything worked out, we gave a dynamite talk, and the money came through.

He had incredible pride in his family. He spoke of his kids often, being known to catch early flights back from travel to make more time with them. He was very proud of the growth of his wife Maria's medical practice. In that spirit let us close this memorial statement with two quotes from his family.

"Ephraim was more than a husband. He was a great friend with extraordinary vision, passion and belief in not only his own goals, but his family's as well. He often would tell people he didn't need any hobbies or toys since his work as a researcher satisfied all of those needs for him. He meant it. His research was his joy.

"Ephraim occasionally took our children, Isaac or Sarah, on conference trips and adventures with him. One particular trip that stood out was when he took our son Isaac, as a young boy, to a DARPA grand challenge. Ephraim was very moved when Isaac, despite the desert heat, looked up at his dad and said, 'You have the coolest job in the world!' Ephraim's response with his typical cockeyed grin was 'Yeaahhh, I do, don't I!'

"We will forever miss Ephraim's enthusiasm for living life to its fullest potential. He is not gone from the hearts of those who had the privilege to have known him, and his visions will move forward in the research community through his former students and colleagues and future generations. His life and work were not in vain."

His son Isaac also had to say: "He was the best father anybody could have asked for. Loving, strong, courageous – I had the privilege to grow up with a bull in my corner. His combination of extraordinary wit and integrity was something I had to grow up to learn is rare in most men. It was easy to have him as a father, because he could always be whatever I needed him to be. I loved him, and I never once had in all of my life one moment's doubt whether he loved me back. He was always steadfast."

David Erickson, chair; Sidney Leibovich, Francis Moon With assistance from Dr. Anna Marie Garcia and Isaac Garcia