

A Few Words at the IEEE-Chicago Fellow Recognition Dinner

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First, please let me thank IEEE-Chicago for organizing this wonderful event and creating this opportunity for gathering and celebration. I would like to thank all friends, colleagues, and IEEE members who are here to share these special moments. To be elevated to an IEEE fellow is a great honor. It is a lifelong achievement. Tonight, I would like to take this opportunity to share my thoughts about what this means for me.

Looking back on my career, it was an uphill journey with many setbacks. In fact, I have met so many setbacks; I pinch my arm to see if I am dreaming whenever I receive exciting news. That is exactly what I did when I received the IEEE fellow notice. Somehow, the subject of the notice email, "RE: Suc-Sun", was really suspicious to me. After the initial "wow", my reaction actually was "wait a moment, is it April 1st already?" Not until my nominator had sent the congratulations and IEEE had posted the new fellow list did I share the great news with my family, friends, and colleagues.

My best-known early work probably is the "memory-bounded" speedup model. It suggests that memory is the performance bottleneck, and algorithm design should not only consider operation counts but also the memory requirement and data reuse rates. It introduces the data-centric computing concept which is considered by many as essential to solve today's "Big Data" problems. Students often ask me for advice on how to conduct the next "memory-bounded" model research. I always ask them if they are ready for long hours, and sometimes seemingly fruitless research work. The "memory-bounded" result was obtained during the seventh year of my graduate study. My long years in graduate school were a setback. My wife, Dr. Hong Zhang, had by then already graduated and joined Clemson University. I was with her whenever possible. But there was no big machine at Clemson which I could use for my research. That was another setback. The good part was that Clemson University had a very good library. Without the opportunity to write programs, I decided to spend my time in the library, reading, thinking, and studying. Scalability was a hot issue then, and Intel just introduced its first cache-supported microprocessor in 1989. I was a straight A mathematics student working towards my math Ph.D. before I transferred to computer science. After I switched over to computer science, I did not take the easy way by leveraging my math background to pursue theoretical computer science. I picked the route to be an experimental computer scientist. I was a part-time system manager of a modern parallel computer during graduate study. That time parallel computers were still in the infancy stage. I often opened and reassembled the computer, and developed an in-depth, hands-on understanding of computer systems. All the stars aligned, I was there at the right time, with the right topic, and was ready to understand the hardware constraints, and ultimately abstract them into a simple mathematical model. The long years of preparation and hard work finally paid off. What were once setbacks turns into a bright new beginning.

More importantly, many of the setbacks I had, and we have, are setbacks from other's perspectives. Only you, yourself can understand whether they were a true setback or an option of

choice. I enjoyed my first six years in graduate school. I was thirsty for knowledge, after losing the opportunity of education through my teen years due to the Culture Revolution. I did not waste my time. I spent all my time studying and had taken more than one hundred and sixty credit hours during my graduate study; most of them were taken in the first six years. I might have wished to graduate with my wife, but I never regretted the six years of devoted study. I enjoyed the process, and it paved the way for my future success.

Equally important, a prevailing failure might lead to future success and a current success could lead to destined regret. The consequence of a living failure or success is based on how it is handled. We may not be able fully control the consequence. But, we can make our best effort in searching for perfection, and in the meantime enjoy the process. Two of my computer science classes give me lasting memory. One is Prof. Stockman's data structure class and the other is Prof. Page's Artificial Intelligent class. I was pretty good in Stockman's class. However, I could not figure out an optional problem on my final exam. I struggled until the end of the exam, and I still could not figure it out. I continued working on it after I got back home, although solving it would not improve my grade anymore. Unexpectedly, the optional problem appeared on my Ph.D. qualifier exam a year later. When I saw it again at the exam, I had a big smile.

The Artificial Intelligent class is another story. Prof. Page was a sharp and witty speaker. His lecture was very enjoyable as long as grades were not a concern. He spoke and turned his slides so quickly, you never had time to take notes; and there was no textbook either, not mention his hand writing was hard to recognize. His exam was matching fifty questions with fifty answers; each question and answer was one paragraph long. With my English being poor at the time, the exam was torture for me. Page had a son who often went to Page's office during that time, playing the computer and working on some of Prof. Page's matching problems. When I received a B, thanks to Page's kindness, and was happily putting the class behind me, I was sympathetic that the boy was not finished with the matching problems like I was. The story seemed to end there, until many years later when I saw this boy's face on TV again, this time as the Google's co-founder, Larry Page. My jaw dropped open. You can imagine how regretful I was for not following up with Prof. Page's matching problems.

I always tell students and young scientists, enjoy your study, enjoy your research, and enjoy the thrill and the excitement of the discovery and innovation. Failure is a part of your preparation, and preparation is a necessary step of success. I always tell them your hard work will be rewarded, sooner or later, by contributing to the advancement of technology, by honors and recognitions, like today. Otherwise, if you open a company, you could be rewarded with money as well. If you are a professor and also open a company, it could be the best of both worlds as you could be rewarded with both honors and money.

Please beware, however, that honors and money are the recognitions of the society. They are the confirmations of your social value, but not the motivation and goal of your hard work. Being a scientist, our goal is to lift the wisdom of human beings. Being an engineer, our goal is to improve the quality of life of human society. Our goal is to make an impact on the advancement of human society. With this goal in your heart, you will not lose your courage with difficulties and will not slow down your pace with success. With this goal in mind, we see Bill Gates donating his wealth to charity; we heard Albert Einstein claim the mountains of science and

never stop. Not everyone can be as successful as Bill Gates or Albert Einstein. But we could have the same goal in heart. This common pursuit forms the force behind the fast advancement of technology. This common ideal is the foundation of the prosperity of human society. Gates and Einstein are the tip of the iceberg. They represent the core values of masses of scientists and engineers.

A good scientist is never being solely geared by honors and money. In the meantime, a great nation always has a good system in place to reward and recognize all the scientists who have made good contributions toward the advance of human society. United States of America is a great nation. I am proud to be part of it!

Thank you.