Why Engineering?

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The question is, why should Wilkes offer engineering programs, and why should students enroll in them, when the leaders of this country and its industry seem determined to send all of our jobs overseas, especially manufacturing and engineering jobs related to manufacturing? First, things are not as perverse as the question assumes. Many of the engineering jobs lost, and those replaced by computers, are what used to be called "grunt level" jobs. After all, "computer" used to be a job description of a person who computes things. Those jobs are gone, along with many other drudgery jobs. What is left are the more important positions, where engineering meets applications and business in the real world. These are the creative jobs where products are envisioned and then defined. There is still a need for people who can do that. The challenges, opportunities, and rewards are greater than ever.

An engineer is someone who invents or creates things. These are typically large or numerous, important and complex enough that you need scientific principles and engineering practices to get it right. What is changing is that, thanks to progress in technology, the nature of inventions that are possible is expanding enormously. Thanks to microelectronics, you can put a computer costing less than a dollar into almost any product now. Autos, microwave ovens, and music players all contain small computers. Soon, micromechanics will allow the same kind of revolution in what can be done with mechanisms. Micromechanic and microfluidic devices in combination with discoveries in biology will enable amazing inventions that will change the world dramatically.

The real limit on what can be done is the human imagination. For example, suppose computation is free. What can you do? Suppose micromachines are possible, practical, and inexpensive down to a scale of, say, 1/1000 of an inch or less. What could you do with that? This is where engineering comes in. Dream big, then refine the dream to fit within the capabilities that are here or will come soon. Then build it. That's what engineers do.

My own story is like that. When I was in high school, computers were big, slow, and clunky. I tried to write a program that would create poetry. Why? I don't know; it seemed to be an interesting goal. Mark that as far from accomplished. If it was poetry, it was very bad poetry. As an undergraduate, I wrote a computer program to simulate the game of football. Only a bit of progress was made on that. I also built a color oscilloscope, somewhat successfully, before such things were common. I had imagined it writing "Merry Christmas" on the screen. It never got that far, but it made a cool light show to go with music. All those projects contributed to my education. So, later when I was in industry, I was able to build practical computer war games that the Army used for analysis, planning, and testing doctrine. I had imagined such a simulation when I was young, and I was able to make it a reality later, thanks to those earlier attempts.

So, dream big! The means to make it a reality may just come along. If you go into engineering, you have a chance to get to the forefront of knowledge and create amazing things never seen before. If you are not in engineering, you still should use your creativity. Imagine the concept, or figure out who could use it and how, or plan the business model. Ask an engineer to help make it a reality. The world is more open to possibilities than ever before.