OCW Faculty Profile: Stuart Madnick

Decades before personal computing ever went mainstream, years before Bill Gates had even programmed his first game of Tic-tac-toe, Stuart Madnick began dabbling in what would become a lifetime pursuit. He came across his first computer in the early 60's during a field trip with his school science club and was hooked.

But if it was truly love at first sight, Madnick wryly remarks, it took a few years for the romance to really bloom, "My father was a shoe cutter, and always made it clear that I needed to learn a real trade. This was long before 'computer science' could be considered an academic discipline—it felt more like a hobby or a game. In the end, my compromise was to study electrical engineering. I figured that I could always fall back onto fixing toasters."

Growing up in a working class family from Worcester, Massachusetts, Madnick and his brothers learned from an early age that hard work and a good education were the path to success. His personal interests lay mainly in math, science… and magic. A few of his notable childhood accomplishments included building a Van der Graaf generator—a machine that creates small "lightning bolt" charges of electricity—and constructing a box that was strategically lined with mirrors, allowing the talented magician to make anyone's head seem to disappear and reappear. He remembers always being a diligent student: "At the end of every school year, I would take out a pile of books from the library, and sit on the lawn in our backyard reading about anti-neutrinos. I'm pretty sure that's not typical summertime behavior."

Little surprise, then, that he was admitted to MIT. Upon arrival, Madnick's first aspiration was to become a nuclear engineer, but he was soon lured into computing, which proved to be a lucrative choice for the young student: "By 1964, computers were becoming more popular at MIT, but people who knew anything about them were pretty scant. That meant that I had a lot of opportunities. I think that at one point or another, I must have worked for almost every department at MIT, helping them with some sort of computing challenge."

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Although Madnick speaks with modesty about his sixty-year career, he has managed to stay far ahead of the computing curve for his entire tenure at MIT. Not only did he create or co-found several high tech companies that remain major actors in the IT field, but he's written over 250 highly influential articles or books. His 1974 textbook, "Operating Systems," was a seminal reference book for decades, and the "Little Man Computer" or LMC model that he invented to teach beginning students the inner workings of a computer's central processing unit (CPU) remains a touchstone for any computer science course. "It's easy to win a race," he offers with characteristic reserve, "when there's no one else in it. I've just been lucky to have been in the right place at the right time."

The broad perspective that he's won over a lifetime in information technology is a welcome contrast to some of the breathless hyperbole that we read in today's media. "There's often a perception that nothing of real interest in technology existed more than five years ago, probably no more than five months ago," he explains, "But many of today's breakthroughs are actually re-implementations of old ideas. Cloud computing and software-as-a-service is a form of the time-sharing work we did in the 60's. Large scale distributed databases are very similar to the parallel processing computers we were looking at in the 80's."

But Madnick is careful not to allow himself to sound too much like, as he puts it, an “old curmudgeon.” The computer industry has clearly undergone massive transformation through steep drops in pricing. “I don't know if I could have quite envisioned how fast and how far things have gone. In 1970, memory cost a dollar a byte. That means that in 1970, a megabyte cost 1 million dollars. Computers were the size of laundry machines. To have come this far is kind of mind boggling.”

His courses strike a careful, pragmatic balance between awe and skepticism. He tries to offer a viewpoint that places as much emphasis on computing’s past as its future. “We have realized a vision of the world that only a generation ago was pure science fiction. A world—just as Isaac Asimov imagined it—where all knowledge is at our fingertips. But now we hear CEO’s and government agencies complain about having more and more information that they know less and less about, because of data quality issues. Sometimes I like to quote Genesis chapter 11, the Tower of Babel. This problem has been around for a long time, and it’s a lot harder to fix than people imagine.”

Maybe one of the reason he can maintain such a balanced perspective is thanks to one of his pursuits outside of teaching—something very un-futuristic. Madnick and his wife own a hotel and restaurant in a restored 14th century medieval castle, called Langley Castle, in the English countryside near Newcastle.

What possessed him? “Insanity helps,” he laughs. In the 80’s, Madnick sold an interest in a company that he had founded, and was looking for an investment. A friend showed him an article about a 14th century castle that was up for sale in England. At the time, the British pound had hit parity with the dollar. On impulse, he bought the castle, even without a clear plan for what to do with it. He briefly entertained a variety of business ideas, including founding a school of falconry catering to Middle Eastern sheiks, but finally settled on a hotel and restaurant.

For Madnick, much of the fun has been learning all about the castle’s remarkable past, and he’s just as happy to talk about its history as anything computer-related. “I love to learn new things. I'm a big fan of continuous learning. That’s what’s so wonderful about OCW, and why I’m such a big supporter of the OCW mission. Through self-learning, I’ve transformed myself several times over the decades. The things I'm doing now are very different from what I did 10, 20, 40 years ago. OCW opens this possibility to everyone.”

OCW Courses taught by Prof. Stuart Madnick:

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