

He's a world leader in digital signal processing

Family expectations guide Chief Tran

When Chief Engineer Tran Thong first came to the States from Vietnam in 1968, he already knew enough about Chicago winters to bring plenty of warm clothes.

Born in Saigon and armed with six years of English classes and a strong interest in electronics, Tran attended the Illinois Institute of Technology where he graduated first in his class of 427 students. He then enrolled at Princeton University, from which he received his Ph.D in Electrical Engineering in 1975.

His entire family now lives outside of Vietnam, where his father was a medical school professor and his mother a physician. His father was also that country's Minister of Health in the late-1950's, and when the war ended in 1973, he subsequently spent four years in a re-education camp because of his political involvement.

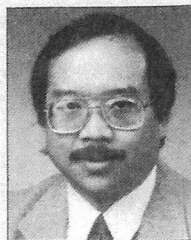
Tran's interest in electricity stems from his high school math and physics classes. He believes that "electricity has two aspects to it: mathematical properties and practical applications." He decided upon electricity for a career so his work "might possibly be used rather than gather dust on a shelf." After completing his dissertation, Tran attended a conference in Rome where he saw one of the circuits he developed prominently displayed. "I felt great. There was some of my research that people were actually using."

While at Princeton he began experimenting with digital signal technology—in which waveforms of analog signals are turned into numbers—for which he would later gain world re-

nown. His early efforts utilized the same technology later used in digital recorders and players. "I asked Princeton to put up the money for a patent but they decided against it. We could have made tons of money."

Tran's accomplishments at Tek include the conceptual development of the 3052 (Shiva) digital spectrum analyzer, WFM-300 Lightning vector-scope, and the Kaleidoscope digital video effects generator. He manages the company's Electronic Systems Laboratory, where one of his objectives is to simplify instrumentation interfacing: "We want our customers to be able to describe what they want to do and then have our equipment take care of it. We don't want them to have to concentrate on how the solutions are being accomplished. Humans are very creative animals, and they should be allowed to concentrate on only what they want to accomplish. Let the computer handle the rest."

Tran currently holds seven patents in digital signal processing. "One advantage to digital signal processing is cost. There's a financial penalty to change from an analog to a digital signal, but once you've accomplished it, the processing of it is relatively inexpensive." He also believes that there will be many new applications for digital processing, particularly in telecommunications and speech enhancement, recognition, and synthesis. "Most long distance telephone lines turn speech into digital signals by taking



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8,000 samples of your voice per second and then using these samples to reconstruct your speech at the other end of the line. Using digital video signals, I wouldn't be surprised if in a few years we could tape events in our homes and send them through phone lines."

Tran says scientific intuition plays an important part in his creative process. "There are a lot of times when I have a gut feeling that something is wrong or right, and without consciously understanding why, I sit down and systematically find out whether I'm right. Intuition gives me the bright light upon which I can verify. I use it to place myself on an almost abstract plane from which more rational work will later develop."

He's the author of 35 articles and is the only current Tek employee to be elected an IEEE Fellow, an honor accorded only 1% of the organization's 300,000 members. The IEEE Board of Governors cited Tran for "contributions to and application of digital signal processing in instrumentation." He was general chairman of the IEEE International Symposium on Circuits & Systems which drew more than 1,000 attendees to Portland in May.

Tran links his motivation to family expectations. "My parents and grandparents had been successful and it's become a family tradition to do well in your chosen profession. The family constantly expects it of you. In Asia there's a very high regard for education. When you're a child at a family reunion, for instance, adults point out to you those older relatives who've done well in their educations. But parents never tell you directly that they expect excellence from you. It's all done through day-to-day activities and through example."