Introduction

Claude Shannon died in my hometown, Medford, Massachusetts, in February, 2001. Age 84, he apparently had Alzheimer’s disease. It is a great irony that the man most responsible for digital memory and information transmission ended his life not being able to remember. I am not sure why Claude Shannon was in my hometown at the end of his life; perhaps his long connection to the Massachusetts Institute of Technology (MIT) made him buy a house there, or maybe it was the Alzheimer’s care facility. When he died, his obituary was carried by a number of national newspapers and several Web sites.
These obituaries all mentioned the same facts. Shannon was a genius, receiving dual bachelor degrees in 1936 in electrical engineering and mathematics from the University of Michigan. He also received a master’s degree in electrical engineering and a PhD in mathematics in 1940 from MIT. His master’s degree thesis, “A Symbolic Analysis of Relay and Switching Circuits,” is regarded as the most important thesis ever written about the topic of information. Combined with his 1948 paper, “A Mathematical Theory of Communication,” Shannon revolutionized the way engineers thought about hardware, and how technologists today are reconceptualizing learning theory, software design, and electronic communications. It is that evolution of technological thought that has impacted social studies so directly.

**Historical Evolution of Social Studies-Based Technologies**

**Claude Shannon’s Vision**

Oddly enough, Shannon became famous by completely ignoring the content of telephone and electronic messages. His work does not concern the message being sent. Shannon did not care if the communication system contained words, pictures, sound files, smoke signals, music, art, hieroglyphics, or the secrets of the universe. What he examined was the amount of error that an electronic system such as the telephone relay systems could tolerate. Obviously, if the message arriving at the receiver was significantly different from the one originally sent, there was no effective communication. Shannon defined the term “entropy” to mean the amount of uncertainty in an information channel. He discovered that Boolean algebra and binary digits could describe the capacity of a channel. The amount of information that could be sent through a channel and the ways to reduce “noise” became the foundations of modern communications.

Digitization of the world is abundantly evident. Compact data disks, digital video disks, and digital music come straight from Shannon’s insight that 1s and 0s are all that are needed to transmit any kind and amount of information. Sending digital packets of data over the Web and the Internet is the direct result of his insights. It is the content of those packets that interests teachers and students. Our pedagogical interest in the contents
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