Frederico Faggin

Born December 1, 1941, Vicenza, Italy; with Ted Hoff, the developer of the silicon gate process and the microprocessor

Education: Dottore in Fisica, summa cum laude, University of Padua, Italy, 1965.

Professional *Experience*: Olivetti R&D Labs, Borgolombardo (Milan), Italy, 1960-1961; assistant professor, University of Padua, Italy, 1965-1966; senior engineer, CERES, Cornaredo (Milan), Italy, 1966-1967; group leader, SGS-Fairchild, Agrate (Milan), Italy, 1967-1968; group leader, Fairchild Semiconductor R&D Laboratories, Palo Alto, Calif., 1968-1970; Intel Corp., Santa Clara, Calif., 1970-1974; cofounder, president, and CEO, Zilog, Inc., Cupertino, Calif., 1974-1980; Computer Systems Group vice president, Exxon Enterprises, Inc., New York, 1981; cofounder, president, and CEO, Cygnet Technologies, Inc., Sunnyvale, Calif., 1982-86; cofounder, president, and CEO, Synaptics, Inc., San Jose, Calif., 1986-Present.

Honors and *Awards*: International Marconi Fellowship Award, 1988; Gold Medal for Science and Technology from the President of the Italian Government, 1988; Grande Ufficiale, (the highest title given by the Italian Republic), the President of Italy, 1992.

Frederico Faggin commenced his career at the Olivetti R&D Labs, Borgolombardo (Milan), in 1970 where he co-designed and built a small electronic digital computer. Following a one-year stint as an assistant professor at the University of Padua (1965-1966), he joined CERES, Cornaredo (Milan), as a senior engineer, working on various aspects of thin-film circuit technology. One year later he was employed as a Group Leader with SGS-Fairchild, Agrate (Milan), where he developed SGS's first MOS fabrication process technology and two commercial MOS integrated circuits.

In 1968 he transferred to the Fairchild Semiconductor R&D Laboratories, Palo Alto, Calif., where he led the development of the MOS Silicon Gate Technology process. Working with Thomas Klein, he developed the first viable process for the fabrication of high-density and high-speed MOS integrated circuits using a doped polycrystalline gate electrode, instead of an aluminum gate currently used at the time. He also designed, in 1968, the first commercial circuit using the silicon gate technology-the Fairchild 3708, an 8-bit analog multiplexer. The MOS silicon gate technology was a major stepping-stone making possible the early development of semiconductor memories and microprocessors and formed the basis of today's IOS/VLSI technology.

In 1970, he joined Intel Corp. and led the design of the first microprocessor family. The basic architecture of what was to become the MCS-4 had already been outlined by Ted Hoff, working in conjunction with Busicom, the exclusive customer of the MCS-4. This chip set was to be used for a series of electronic calculators. Faggin

took over the project and, in 11 months, single-handedly developed the four-chip set that included the first single-chip microprocessor. His work involved the refining of the architecture, doing the logic design, the circuit design, and the layout, and also bringing the MCS-4 into production. Faggin then demonstrated non-calculator applications for the MCS-4 and convinced Intel's management to offer the MCS-4 for sale as a general-purpose chip set.

In the spring of 1971, Faggin led the development of the "8008," the first 8-bit microprocessor, and brought it to market one year later. Faggin conceived the 8080 in 1972, development took place in 1973, and he led the design of the product in early 1974.

During his almost five years at Intel, Faggin developed or directed the development of approximately 30 integrated circuits and provided the key leadership role in all of Intel's microprocessor direction.

At the end of October 1974, Faggin left Intel to start a new company—Zilog, Inc. His idea was to create a company dedicated to the emerging microprocessor and microcomputer market. The first product that Faggin conceived was the "Z80." Introduced in 1976, the Z80 was the most successful 8-bit microprocessor ever produced and was still in high volume production in 1992. He led the company that for several years was at the forefront of microprocessor technology.

After some years with Exxon Enterprises, Inc., in New York, and founding Cygnet Technologies, Inc., in Sunnyvale, Calif. (1982-1986), Faggin co-founded Synaptics, Inc., a company with the purpose of developing integrated circuits for information sensing and processing, using some of the working principles of animal nervous systems. Such artificial neural networks are expected to enable the creation of autonomous intelligent machines. Synaptics has developed the world's first Optical Character Recognizer Integrated Circuit, combining an area imager and two neural networks on the same chip. Synaptics is the leading company in the development and application of neural network technology for the solution of practical problems. Synaptics has created a new implementation technology, Adaptive Analog VLSI, for sensory, sensory preprocessing, and pattern recognition tasks.

Faggin is currently (1993) president of Synaptics.

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UPDATES

Portrait added (MRW, 2012)