Neural network computer chips

Scientists at AT&T Bell Labs are testing computer chips that mimic the way some brain cells are thought to retrieve stored information and solve problems. The goal is to create specialized machines that can recognize and remember by association, tasks that living organisms now perform much faster and more efficiently than computers.

ENNs, short for electronic neural networks, are compact, highly interconnected networks of many simple components, such as resistors and amplifiers. These "artificial neurons" function continuously and collectively to obtain information quickly.

The most complex chip so far consists of 256 electronic neurons—about 25,000 transistors and more than 100,000 resistors—all on about a quarter inch square of silicon.

Researchers expect ENN chips to retrieve information in about 400 ns, a speed much faster than that of biological neurons. The planned application is image processing, in which the chips will be used to extract significant features from a picture or set of characters.

Intel enters ASIC market

Intel is offering a new line of ASIC products, merging its microcomputer architectures with semicustom design methodologies and IBM's gate array technology. Intel will also provide extensive training and service support and an integrated design environment for developing, designing, and producing EPLDs, gate arrays, and cell-based ICs.

Intel products range from EPLDs to gate arrays and advanced cell-based ICs. In the upper range of the family are ASICs that incorporate cells or cores of Intel's 80C51 microcontroller, microperipherals, and later the 8086s.

The ASIC Components organization is an independent unit within Intel. It includes Cellular Products Operation and Gate Array Operation. Services provided include technical training and design assistance through a network of design centers in Santa Clara, Calif.; Boston; and Swindon, England.

Cellular Products Operation offers a cell-based library that supports over 100 small-, medium-, and large-scale integration cells in a double-layer metal, 1.5-micron CMOS process.

Through an agreement with IBM, Gate Array Operation offers 10 double-layer metal, 1.5-micron CMOS gate arrays, including eight standard arrays with densities from 2500 to 19,000 gates with 2304 bits of RAM.

ASIC design centers increasing

By 1990 regional VLSI IC design centers will assist more than 60% of all system designers in developing application-specific ICs (ASICs), representing 75% of the $7.2 billion in ASIC sales. This is just one of the findings of the technology impact report Customizing VLSI Integrated Circuits Update—A User's Guide to the ASIC Design Center from Electronic Trend Publications.

VLSI design centers are regional silicon services firms that provide design assistance. They are emerging because IC design resources are at a premium, except for large OEMs.

Designers have accelerated R&D efforts to reduce product costs, increase performance, and create market niches by tailoring systems to specific user needs. Traditionally, large system OEMs with internal IC design capability have achieved these objectives through aggressive use of full-custom VLSI. Recent advances in CAD/CAE technology have put this capability within reach of the smaller OEM. However, still lacking for most is a sufficient pool of IC design talent.

Of an estimated 3000 to 4000 expert IC designers worldwide, 65% are employed by semiconductor manufacturers—and the number is likely to remain fairly constant, as it has in the last 10 years. The number of system designers, on the other hand, has tripled in this period and will double again by 1990. The ratio of IC to system designers has steadily dropped, creating a huge demand for IC design expertise. A likely product is the emergence of the VLSI design center.

In North America, there are more than 150 such centers. The ETP report is designed to aid OEMs in understanding and using this expertise. It profiles major suppliers of silicon services to the OEM, including IC design houses, mask makers, packaging houses, foundries, and semiconductor manufacturers. The report costs $985. Contact ETP, 12930 Saratoga Ave., Suite D1, Saratoga, CA 95070; (408) 996-7416.

Industry uncertain over US/Japanese pact

The semiconductor industry seems to have adopted a "wait and see" attitude toward the recent US/Japanese trade agreement, according to C. Scott Kulicke, president of SEMI and chairman of the board of Kulicke & Soffa Industries. "No one is really happy with the agreement, except possibly the Koreans, since it may well hand them the worldwide DRAM market," he said.

The agreement has not pulled US IC manufacturers back into the DRAM business, which was clearly one of its goals, according to Kulicke. At the same time, the agreement raises the price of Japanese memory devices in world markets, which upsets Japanese producers as well as their customers.

In addition to setting prices on certain semiconductor devices to discourage the "dumping" of Japanese products on the US market at less than fair market prices, the pact specifies that Japan open approximately 20 percent of its own market to US-made semiconductors.

This is where the "wait and see" attitude comes in. "Device manufacturers are sitting on their wallets, waiting before making any commitments," Kulicke said. He predicts that with the appreciation of the yen and Japan's substantial share of world markets, growth in each product area will probably be flat or slight, indicating a general decrease in the number of units sold in 1987.

Novel computer gifts

Black Box is offering "King Chip," a board game made up of 4000 computer-related questions in six categories: data communications, history and current events, hardware, jargon and acronyms, potpourri, and software. Up to five can play.

To order King Chip or a catalog for browsing, contact Black Box, PO Box 12800, Pittsburgh, PA 15420; (412) 746-5500; $39.95.