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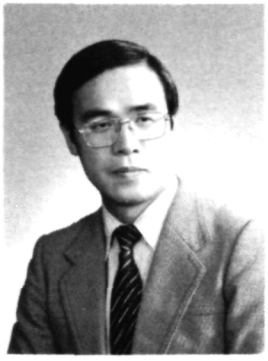

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Dr. Yamakawa received his B.E. degree in electronics engineering from the Kyushu Institute of Technology in 1969, and his M.E. and Ph.D. degrees in electrochemistry from Tohoku University in 1971 and 1974, respectively. In 1974, Dr. Yamakawa joined the faculty of engineering at Tohoku University as a research assistant in electronics. In 1977, he joined the faculty of engineering at Kumamoto University as a research assistant in electrical engineering. Since 1981, he has been an associate professor of electrical engineering and consumer sciences at Kumamoto University. Dr. Yamakawa is a member of the editorial board of the International Journal of Fuzzy Sets and Systems and a referee for the computer society of IEEE. He is also a program committee chairman of the international workshop to be held at Iizuka, Fukuoka, Japan, from August 20 to 24, 1988, and a program committee member of three international symposiums/conferences. Dr. Yamakawa's research interests include development of fuzzy logic hardware systems and multiple-valued logic circuits (both in integrated circuits) as well as biomedical sensors. He is a pioneer of fuzzy chips and fuzzy computer hardware, and has applied for 53 patents in Japan, 7 patents in the United States, and 5 patents in Europe.

A FUZZY MICROPROCESSOR - A NOVEL DEVICE FOR HIGH-SPEED APPROXIMATE REASONING

Abstract

A fuzzy controller hardware device demonstrated in the second IFSA Congress has distinctive features: (1) high speed (1 000 000 FIPS); (2) easy programming; (3) suitability for nonlinear and/or time-variant systems; and (4) robustness against the noise, temperature change, power supply fluctuation, and defect of transistors. The hardware also has a slight misprogramming. The rule board and the defuzzifier board are reduced to small chips. They are a rule chip and a defuzzifier chip. By employing these two types of chips, a sophisticated fuzzy controller hardware system can be easily implemented.