Citation

For pioneering achievements in the field of image processing, machine translation and system of digital library and enormous contributions to the promotion and development of academic researches

Dr. Makoto Nagao

Position and Organization :
Professor Emeritus and Past President, Kyoto University

Degree : Ph.D. (Kyoto University, 1966)

Date of Birth : October 4, 1936

Brief Biography :

1959 Graduated from Kyoto Univ., Faculty of Engineering, Undergraduate School of Electrical and Electronic Engineering
1961 Completed postgraduate master's program, Kyoto Univ. Research Associate, Kyoto Univ. Faculty of Engineering.
1966 Ph.D. in Engineering, Kyoto Univ. Senior Lecturer, Kyoto Univ. Faculty of Engineering
1969 Visiting Associate Professor, Univ. of Grenoble Alpes(France)
1973 Professor, Kyoto Univ., Faculty of Engineering
1976 Professor, National Museum of Ethnology (concurrent post)
1991 Inaugural Chair, International Association for Machine Translation
1994 Inaugural Chair, Association for Natural Language Processing
1997 President, Kyoto University
2004 Founding President, National Institute of Information and Communications Technology
2007 President, The National Library
2014 Member of the Japan Academy
2015 Director, The International Institute for Advanced Studies
2017 Founding President, Japan Society for Digital Archives

Other Positions (selected)

President, Institute of Electronics, Information and Communication Engineers
President, Information Processing Society of Japan
President, Japanese Cognitive Science Society

Main Awards and Honors:

1993 IEEE Emanuel R. Piore Award
1997 Medal of Honor with Purple Ribbon
1999 C&C Prize, NEC C&C Foundation, Japan
2004 ACL Lifetime Achievement Award
2004 Legion d'honneur Chevalier
2005 Japan Prize
2008 Person of Cultural Merits
2018 Order of Culture

Main Achievements :

Dr. Makoto Nagao graduated from Kyoto University, Department of Electrical and Electronic Engineering in 1959. After completing the University's Master's program in 1961, he was appointed as an assistant at Kyoto University Faculty of Engineering. In 1966, he obtained a Ph.D. in Engineering (Kyoto University) for research on language analysis and character recognition, and advanced to the position of professor in 1973. Over this period – 1969 to 1971 – he was involved in research on machine translation as a visiting associate professor at the University of Grenoble Alpes in France.

Dr. Nagao has achieved remarkable results in the two fields of image processing and language processing. Where the former field of image processing is concerned, he achieved pioneering results that introduced knowledge-based methods of flexible processing control, including facial recognition (the world first achievement) through the new concept of the application of feedback mechanisms and furthermore through expanding that to the analysis of complex aerial images through the application of the blackboard model.

Additionally, in the latter field of language processing, in 1978 he developed a translation system for abstracts of science and technology papers, and scaled it up as a four-year period from 1982 by the request of the Science and Technology Agency. It was at this point that Dr. Nagao introduced the concepts of case grammar and semantic features, and completed a Japanese-English / English-Japanese machine translation system for science and technology abstracts. This technology significantly influenced the development of the machine translation systems at many companies and formed the foundation for subsequent machine translation research in Japan. Furthermore, in 1981, Dr. Nagao led the world in proposing a principle of translation by analogy that involves storing large numbers of parallel translation examples and undertaking translation by detecting their similarities. This became known as example-based machine translation, and today research and development that incorporates this approach is being carried out in various locations worldwide. This method based on data was the beginning of solving problems by utilizing big data.

As a professor at the National Museum of Ethology from 1976 to 1995, he also contributed to the exposition of the museum by establishing and introducing a system of information on visual contents named Videotheque.

After achieving the significant results in image processing and language processing mentioned above, from around 1990, Dr. Nagao began newly researching digital libraries. This aimed to investigate a comprehensive information processing system that incorporated multimedia information processing and digital communication functions. It became pioneering research that presented a future approach for libraries, whereby digitalized materials are organically combined.

On top of these achievements, Dr. Nagao has not only undertaken research on information processing but has also been involved in university administration as well as endeavoring to promote and advance Japan's scientific research. After serving as head of the Data Processing Center at Kyoto University, as head of Kyoto University Library and as Dean of the University's Graduate School of Engineering, in 1997, he was appointed as the 23rd President of Kyoto University. Projects that were brought to fruition during his term as President include the opening of the new Kyoto University campus in the Katsura area, and as President of the Japan Association of National Universities, he also pressed ahead with transforming Japanese national university system into national university corporation system which is more independent than before. After stepping down from his role at Kyoto University, he served as the founding President at the National Institute of Information and Communications Technology, before being appointed as the President of the National Library from 2007. He digitalized more than two million books and realized the system of high-grade digital library.

Subsequently also, Dr. Nagao successively served as a member of the Japan Academy and as Director of the International Institute for Advanced Studies. In addition to these roles, he also served as the inaugural Chair at the International Association for Machine Translation and Association for Natural Language Processing, both of which he founded.

In recognition for these long years of outstanding research achievements and social contributions, Dr. Nagao has been granted awards that include the IEEE Emanuel R. Piore Award, the Institute of Electronics, Information and Communication Engineers Achievement Award, the Information Processing Society of Japan Achievement Award and the Association for Computational Linguistics Lifetime Achievement Award. Alongside these, he also won the Medal of Honor with Purple Ribbon in 1997, the Japan Prize in 2005, Person of Cultural Merits in 2008, and received the Order of Culture in 2018.

In this way, Dr. Nagao is considered to be a fitting recipient for the Okawa Prize for his pioneering achievements in the areas of image processing and language processing, in the field of information processing in general, along with his huge contributions to the promotion and advancement of scientific researches.