

# CV of Professor Ken Sakamura

## **Prof. Dr. Ken Sakamura,**

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Born in Tokyo in 1951, he received Ph.D. in Electrical Engineering from Keio University, Tokyo, Japan in 1979 and subsequently became a research associate at the University of Tokyo, where he has stayed ever since. He has become a full professor since 1996

At present, he is a professor of the Interfaculty Initiative in Information Studies at the Graduate School of the University of Tokyo, and also acts as director of the YRP Ubiquitous Networking Laboratory (UNL for short). UNL was established in 2002, and is an independent laboratory for research and development for “ubiquitous networking” and “ubiquitous computing”. He is the chair of T-Engine Forum and uID center. T-Engine Forum is a non-profit organization to promote the result of the latest result from “TRON Project” (details below). uID center is an organization which is at the core of the management of ubiquitous ID architecture promoted by UNL.

He has also served on many government committees. Currently, he is the committee chair for the “Free Mobility Assistance Project” steering committee (sponsored by the Ministry of Land, Infrastructure, Transportation and Tourism). Free Mobility Assistance Project is a project for e-mobility and e-inclusion for the physically-challenged people who have difficulty moving as well as offering sight-seeing, shopping and other commercial information to citizens. The project is based on the idea of “universal design” and thus serves everybody.

## **TRON Project**

He has been the leader of the TRON Project which started in 1984 and has been active for more than 20 years now. The name "TRON" stands for “The Realtime Operating system Nucleus”. The project aims at improving the state of the art of the operating systems for realtime embedded devices.

## **Open Approach**

The project can be characterized by its open approach: the technical specifications produced in the project have been made available to the public, and can be used for free. The specification can be used to create royalty-free products. The latest version of the operating system produced in the TRON project is called T-Kernel and its source code is available for free from

T-Engine Forum web site. There is no royalty attached to the use of the source code. It is literally open and free.

### **Popularity**

The operating systems based on the specifications produced in the TRON project have been used widely in the real world. In Japan, it is believed that 60 percents of high-end embedded systems use the operating systems based on the technical specifications produced in the TRON project. The name “TRON” is very famous in the embedded system industry in Japan and beyond. The products that use such operating systems include

- TOYOTA automobiles (engine control)
- automobile navigation systems,
- printers, copiers, and FAX machines
- digital cameras
- mobile phones
- and many other embedded computer systems.

The sheer numbers of the embedded computer systems that use the operating systems based on the TRON specification(s) make such operating systems most popular of its kind in the world.

### **Ubiquitous Computing**

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Prof. Ken Sakamura is very interested in making computers small and embedding them in many objects in the real world. What he has achieved in the on-going TRON project is useful for ubiquitous computing in the future. (“Ubiquitous Computing” is a word coined by a researcher in USA. In Japan, a Japanese phrase that is equivalent to “Computers Everywhere” has been used in the TRON Project since 1980’s before the term “Ubiquitous Computing” was born.)

Currently he is very interesting in promoting “ubiquitous computing” paradigm into a social infrastructure. Research and development of chips for RFID (Radio Frequency IDentification) as well as the software systems for the application is being done at his laboratory at the University of Tokyo and at YRP UNL.

The latest series of trials of using RFID technology for offering sight-seeing, shopping, barrier-free facilities, and other useful information to pedestrians have attracted media attention all over the world. Such trials have been going on in Tokyo (Asakusa, Ueno, Ginza and a few other places), Kobe, Kyoto and other cities in Japan. These trials are meant to test the ideas in real-world setting.

## **Wide Scope of activities**

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Aside from computer systems, Prof. Ken Sakamura has paid attention to the artistic design of electronic appliances, furniture, houses, buildings, urban landscape and museums, all of which contain the network-aware embedded computers based on the TRON specification. In a nutshell, he has led the research of the total architecture of ubiquitous computing in our daily lives.

For the housing and building community, the Intelligent House “PAPI” with its floor space of about 650 square meters which he designed and was completed in 2005 attracted much attention from architecture community.

## **Accomplishments**

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He has written many books, magazine articles for general audience and reviewed technical papers.

He served as the editor in chief of IEEE MICRO Magazine for four years. For his contribution, he has been elected as fellow and the golden core member of the IEEE Computer Society (headquarters in USA).

For his achievements, he has been the recipient of the following prizes:

- 2001 Ichimura Academic Prize (Special Award)  
METI Minister's Award.  
Takeda Award
- 2002 Commendation on “Radio Day” by the minister of Internal affairs and communications.  
Okawa Prize (Publication Prize)
- 2003 Medal with Purple Ribbon (from Japanese Government)
- 2004 Okawa Prize (Main Okawa Prize)
- 2005 Prime Minister's Award
- 2006 Japan Academy Prize