

TRON Real-Time OS (RTOS) Family recognized as IEEE Milestone

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TRON Forum (Chair Ken Sakamura, IEEE Life Fellow/IEEE Computer Society Golden Core Member, Dean of Faculty of Information Networking for Innovation and Design, Toyo University Director, YRP Ubiquitous Networking Laboratory Professor Emeritus of the University of Tokyo) is pleased to announce that TRON RTOS family, has been recognized as IEEE Milestone by IEEE (Institute of Electrical and Electronics Engineers), the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

An IEEE Milestone recognizes a significant technical achievement that occurred at least twenty-five years ago in an area of technology represented in IEEE.

The official name of the Milestone is "TRON Real-time Operating System Family, 1984." The TRON project was started in 1984 by a computer architecture project team and its partners under the leadership Ken Sakamura at the University of Tokyo. This is an open innovation project, which was rare at the time, to establish an efficient development environment for embedded systems in anticipation of the era when what we now call the IoT environment becomes commonplace. The TRON real-time OS family was planned, researched, and developed as the core of this development environment. This OS is widely used and continues to improve and evolve. The specification of a family member, μ T-Kernel 2.0, has been adopted as an IEEE standard (2050-2018).

The Milestone citation reads as follows.: *In 1984, a computer architecture project team at the University of Tokyo began designing The Real-time Operating system Nucleus (TRON) OS family and helping external partners commercialize it. Specifications and sample source code were provided openly and freely, facilitating innovations by developers and users. TRON real-time OS family copies have been adopted worldwide in billions of embedded computer devices, including aerospace and industrial equipment, automotive systems, and home electronics.*

“IEEE Milestone recognition is a great honor for the project and its members and users of the TRON RTOS family who have produced numerous products that are part of our daily living and social infrastructure. I am delighted that our activity of TRON Project is recognized this way,” Sakamura stated on this occasion.

Under Sakamura’s leadership, TRON Forum will continue to provide, improve, and promote the TRON RTOS family, their development and network environment that support them so that they can be used easily in consumer markets. The Forum would like to thank the members and partners for their past cooperation and continued support in future promotional activities.

Milestone plaque dedication ceremony is being planned this fall at the University of Tokyo campus where the plaque will be permanently displayed.

About IEEE

IEEE is the world’s largest technical professional organization dedicated to advancing technology for the benefit of humanity. Through its highly cited publications, conferences, technology standards, professional and educational activities, IEEE is the trusted voice in a wide variety of areas ranging from aerospace systems, computers, and telecommunications to biomedical engineering, electric power, and consumer electronics. Learn more at <https://www.ieee.org>

About IEEE Milestone

The IEEE Milestones in Electrical Engineering and Computing program honors significant technical achievements in all areas associated with IEEE. It is a program of the IEEE History Committee, administered through the IEEE History Center. Milestones recognize the technological innovation and excellence for the benefit of humanity found in unique products, services, seminal papers and patents.

IEEE established the Milestones Program in 1983 in conjunction with the 1984 Centennial Celebration to recognize the achievements of the Century of Giants who formed the profession and technologies represented by IEEE.

Each milestone recognizes a significant technical achievement that occurred at least twenty-five years ago in an area of technology represented in IEEE and having at

least regional impact. To date, more than two hundred thirty Milestones have been approved and dedicated around the world.

Learn more at https://ieeemilestones.ethw.org/Main_Page

About TRON Project

TRON Project is a computer architecture development project by collaboration of industry and academia and started in 1984. Ken Sakamura (IEEE Life Fellow/IEEE Computer Society Golden Core Member, Dean of Faculty of Information Networking for Innovation And Design (INIAD), Toyo University / Director of YRP Ubiquitous Networking Laboratory) is the project leader and the project has conducted research and development activities in RTOSs for embedded systems, their development environment, the IoT network and other topics.

The architecture, the achievement of this project, has been widely used in embedded systems in various industries ranging from consumer products such as automobile engine control, digital cameras, smartphones, etc., to industrial products including the machine control inside factories. TRON Project has proposed and promoted Open Architecture since its inception. TRON Project actively suggests standard specifications to international standardization associations such as ITU-T, ISO, and IEEE SA, and contributes to the international standardization of the infrastructure technology.

There is an NPO, TRON Forum that promotes the activities of TRON Project. For details of the project, please see its website.

<https://www.tron.org/>

About TRON Open Architecture

TRON Project has proposed and promoted Open Architecture since its inception. In its vision, computers based on open architecture will be embedded into many devices, and realize the IoT networking environment that supports our lives.

The results of TRON Project such as the whole source codes of TRON RTOSs including T-Kernel and μ T-Kernel are published, and can be copied and modified.

These outputs have been recognized as important element of “TRON Real-time Operating System Family, 1984” as IEEE Milestone.

International Standardization Activity by TRON Project

In addition to making open specification and open source code available, TRON Project actively suggests standard specification to international standardization associations such as ITU-T, ISO, and IEEE SA, and contributes to the international standardization of the infrastructure technology.

“IEEE 2050-2018 – IEEE Standard for a Real-Time Operating System (RTOS) for Small-Scale Embedded Systems” was based on the specification of μ T-Kernel 2.0, an RTOS developed by TRON Forum. The latest version, μ T-Kernel 3.0, conforms to IEEE 2050-2018 completely. This again is an important element of “TRON Real-time Operating System Family, 1984” as IEEE Milestone.

TRON Project has proposed an identification system, ucode, for identifying many devices and data in the IoT age, and a code system based on it has become ITU-T Recommendations. (Y.4804/H.642.1. The project has contributed to the standardization of related standards, ITU-T Y.4551/F.771, Y.4802/H.642.2.)