October 19, 2020

Press Release

Announcing the CEATEC AWARD 2020 Winners of The Minister of Internal Affairs and Communications Award, The Minister of Economy, Trade and Industry Award, and Category Awards.

CEATEC Executive Board

The CEATEC Executive Board ― comprised of the Japan Electronics and Information Technology Industries Association, the Communications and Information Network Association of Japan, and the Computer Software Association of Japan ― is pleased to announce that CEATEC 2020 ONLINE will be held from October 20th (Tue.) to 23rd (Fri.). Emphasizing the exhibition theme of, "CEATEC – Toward Society 5.0 with the New Normal", the CEATEC AWARD 2020 event will also be held with the goal of realizing Society 5.0 through CPS/IoT, which will contribute to the creation and development of new value and markets while invigorating related industries. Coinciding with the launch of the online exhibition, the executive board will announce the CEATEC AWARD 2020 recipients of two ministerial awards – the Minister of Internal Affairs and Communications Award and the Minister of Economy, Trade and Industry Award – as well as the Category Awards, all of which have been selected by the CEATEC AWARD 2020 review board panel of judges.

Mr. Waichi Sekiguchi, President of MMRI and Chairman of the CEATEC AWARD 2020 review board panel of judges, commented that as CEATEC AWARD 2020 recipients are selected from technologies, products, and services on display at the CEATEC online exhibition, the review board was concerned about a possible decrease in the number of applicants due to the transformation of the show from a physical venue to a virtual one. However, there were actually sixty-two exhibitor applications in a mere one-month period ― a significant number brought forth during this COVID-19 pandemic by the "New Normal" theme of the CEATEC 2020 exhibition. As such, this year's event will see a considerable number of exhibitors focusing on the post-coronavirus era by showcasing innovative technologies as the Supercomputer Fugaku. Co-developed by RIKEN and Fujitsu, this recipient of the Minister of Internal Affairs and Communications Award was recognized for its ability to precisely simulate the dispersal of airborne droplets.

The Minister of Internal Affairs and Communications Award

Supercomputer Fugaku

Fujitsu, Ltd. (Exhibit area: General)

RIKEN

Outline

Fugaku is one of the world's fastest supercomputers. As well as offering top-class performance, it can run a wide range of applications. It is being jointly developed by RIKEN and Fujitsu with the aim of

making it available to users from fiscal 2021. Coordinated development of both system and applications has resulted in a supercomputer that delivers world-class results: low power consumption, high computational power, user friendliness and flexibility. Compared with its global rivals, Fugaku excels in each category, as well as in its comprehensive strength.

Assessment

Thanks to coordinated development of both system and applications, Fugaku delivers world-class results: low power consumption, high computational power, user friendliness and flexibility. Compared with its global rivals, this supercomputer excels in each category, as well as in its comprehensive strength. Also highly evaluated was the developers' success in optimizing performance and power efficiency at the same time, creating a world-first supercomputer that is designed not just for raw power but also for user friendliness. Fugaku is expected to contribute to expanding the potential of Japan's electronic and IT industries, as well as enhancing industrial competitiveness in multiple fields. As support infrastructure, it will promote digital transformation, helping to find solutions to issues facing society in numerous fields – life sciences, energy, manufacturing, environment, etc. – where innovations are eagerly anticipated from supercomputer applications.

The Minister of Economy, Trade and Industry Award

MicroRNA detection technology

Toshiba Corporation (Exhibit Area: General)

Outline

MicroRNA detection technology enables very early detection of cancer by measuring the concentration of microRNA secreted by cells into the blood. The presence of cancer cells results in increased levels of specific microRNA molecules in the blood and Toshiba has developed a unique electrochemical method for detecting these changes. This system can quickly and accurately identify the presence of any of 13 different cancers – including pancreatic cancer, which is difficult to detect at an early stage – even at stage 0. During the research and development phase, it was determined that the system, which takes 2 hours to process a sample, can detect microRNA with 99% accuracy.

Assessment

This compact device can make a significant contribution to medical care by improving QOL as it can offer a quicker way to detect metastases and cancer recurrence via a blood test that puts little burden on the patient. Both the device and electronics that comprise the technology are "Made in Japan". Compared with RNA detection technologies developed in other countries, it is superior in terms of speed and cost. The technology shows promise for use as an international medical package with a wide range of applications, including the identification of diseases other than cancer. It is expected to become a valuable tool for tracking biomarkers. The aim is to have these tests covered by health insurance and to have them included as part of the National Health Insurance basic medical examination. In addition, this technology was highly evaluated for its potential to contribute to achieving SDG 3 – "Ensure healthy lives and promote well-being for all at all ages".

Category Awards

① New Normal Solutions Category

■ Grand Prix

Transparent Display Partition

Sharp Corporation (Exhibit Area: General)

Outline

To prevent the spread of COVID-19, increasingly partitions are being erected to physically separate people from each other, and this trend is expected to continue in the future. However, there are also concerns that such partitions may interfere with interpersonal communications and create a sense of being cooped up in an enclosed space. As a solution to this, Sharp has developed this display partition that is highly transparent and non-luminescent, offering new potential and better lifestyle options under “new normal” conditions.

Assessment

With partitions being increasingly used to separate people and thus control the spread of COVID-19, the company developed this display partition that is highly transparent and does not emit light. It excels compared to conventional solutions with a transparency of over 60% and its use of ambient light for display. This helps to lower communication barriers and the sense of being in an enclosed space. A partition that can display information offers fun and convenience while providing a sense of security through physical separation. Moreover, with the integration of communication technologies such as 5G and IT technologies such as AR, as well as tie-ups with various industries, this product is expected to play a useful role in “new normal” life by providing a window of information that delivers appropriate information in appropriate locations, entertaining and enhancing people’s sense of security. This groundbreaking idea represents an ingenious adaptation of existing LCD technology to meet the needs of the times. Additionally, the display of information on partitions is expected to foster the development of new markets.

■ Semi Grand Prix

Simulated Bifurcation Machine

Toshiba Corporation (Exhibit Area: General)

Outline

Simulated Bifurcation Machine (SBM) refers to technologies for solving large-scale combinatorial optimization problems with high speed and precision. Many issues facing modern society, such as finding optimal routes to alleviate traffic congestion, are combinatorial optimization problems in which the solution is the optimal choice from among many possible combinations. The total number of combinations is typically huge, making it difficult to find a solution quickly using conventional techniques, but SBM can rapidly find an optimal solution and can thus contribute to solving various problems.

Assessment

Combinatorial optimization is recognized for its ability to rapidly solve many issues facing modern

society, such as finding the optimal routes for vehicles to alleviate traffic congestion. It is expected that this highly flexible technology, provided either as a Cloud service or on-premises, can be used for a wide range of purposes and it is expected to contribute to solving a variety of issues. When put to work for local governments and industry, SMB will pave the way to the creation of an efficient and sustainable world.

② Elemental Technologies and Devices that Support the New Normal Society Category

■ Grand Prix

Touchless Control Panel

Alps Alpine Co., Ltd. (Exhibit Area: Themed Exhibit - New Normal)

Outline

This touchless panel can be operated without hands or fingers coming into contact with the screen. Proprietary capacitance sensors featuring high sensitivity can detect the presence of a hand as it approaches within 10cm. The company's unique ASIC and algorithms allow this screen to accurately detect the distance between it and a hand/finger, enabling various operations in response to gestures. The panel can be used in medical and nursing care facilities where hygiene is a priority, as well as in public facilities and homes, where it is important and/or desirable not to come into physical contact with buttons/switches. It can also contribute to preventing the spread of infectious diseases such as COVID-19.

Assessment

This technology is highly regarded for its excellent design flexibility and abundant potential for implementations in daily life: by replacing existing buttons and switches, in addition to touchscreens, it can be used in a wide range of markets and applications. It can be employed for elevators, for residential lighting, for ticket vending machines in stations and in restaurants, for checkout kiosks in hotels, in hospitals, for seat-back displays on aircraft, and in ATMs. This technology helps solve the problem of physical/psychological avoidance of physical contact in the "new normal" world we live in, providing safe, secure, and convenient operation. Also highly evaluated was the system's ability to solve such security issues as the risk of a third party determining a PIN from the fingerprints left on a screen.

■ Semi Grand Prix

Ultrasmall Full Color Laser Light Module for AR Glasses

TDK Corporation (Exhibit Area: Themed Exhibit - New Normal)

Outline

With the increasing popularity of on-line conferences, it is likely that demand will increase for AR glasses that allow participants to feel closer to each other. To this end, TDK has developed a full-color planar waveguide module in collaboration with NTT (Nippon Telegraph and Telephone). The company has achieved a significant reduction in the size of AR glasses as well as developing a rapid 5-second production process for the alignment/bonding of the waveguide and laser.

Assessment

In the future, the AR glass market is expected to grow to 10% of the size of the smartphone market, and

TDK believes that the productivity gains and product miniaturization it has achieved will make these AR glasses highly competitive. In addition, the company's high-speed laser alignment and bonding technology makes it possible to reduce the size of optical components (which have proved difficult to miniaturize) to the size of electronic components, thus significantly contributing to the development of wearables. This technology is also anticipated to be of use for silicon photonic devices, which will play a major role in the high-speed optical communications that will become necessary with widespread 5G.

③ Digital City Planning in The Age of The New Normal Category

■ Grand Prix

InWheelSense™ – Wheel conclusive sensing using piezoelectric power

TDK Corporation (Exhibit Area: Themed Exhibit - New Normal)

Outline

InWheelSense enables power generation using energy-harvesting modules for automotive tires/wheels. It is also a sensing solution for acquiring data, powered and operated within the wheel. Power generation is enabled by piezoelectric elements which generate electricity from the counterforce applied to a tire when it contacts the road surface, while the output characteristics make it possible to detect different driving conditions. Thus, both sensing and power supply are fully contained within the wheel.

Assessment

InWheelSense facilitates the acquisition of new types of data important for autonomous driving, thus helping to ensure improved safety and comfort. Using piezoelectric elements, which have already proved themselves as in-vehicle components, this highly economical sensing solution is expected to contribute to "tire intelligence". In addition, because it harvests the power necessary for sensing, signal processing and wireless data communication from within the rotating wheel, it is expected to serve in many applications, including the detection of tire pressure, tire wear, and road surface conditions. It will contribute to tire/wheel IoT applications that are environmentally friendly. Also highly evaluated was the stability provided by compressive stress during driving, which holds promise for expanding the possible uses for this power generation and sensing solution.

■ Semi Grand Prix

The Industry's First Zero Cross Detection ICs "BM1ZxxxFJ series" Contributes to minimizing standby power in IoT home appliances

ROHM Co., Ltd. (Exhibit Area: General)

Outline

With the accelerating adoption of IoT in recent years, more and more home appliances are continuously communicating via Wi-Fi, even when in standby mode. However, there are increasing demands to reduce power consumption, meaning significant innovation is needed. In looking for a solution, ROHM focused on the zero-crossing detection circuit, which all manufacturers have overlooked despite the fact that it is essential for any always-on home appliance. The company has developed a zero-crossing detection IC chip that reduces power consumption associated with zero-crossing detection by as much as 98% (compared with conventional systems), thus significantly contributing to a reduction in the

power consumption of IoT-enabled home appliances.

Assessment

Appliance manufacturers are urgently required to reduce standby power, as regulations are expected to become stricter in the EU and other countries. Despite the fact that the number of required functions is increasing, reduced power consumption during application operation is increasingly sought. If this IC chip comes to be used a wide range of appliances, it will result in a considerable reduction in CO_2 emissions, thus making a significant contribution to environmental protection. Based on the knowledge it has gained over many years of R&D, the company has adopted an “outside the box” approach that differs from conventional power consumption reduction methods. It focused on the hitherto ignored area of zero-crossing detection, enabling it to successfully develop an IC that has been highly evaluated. In addition to the much-anticipated reduction in standby power consumption offered by this chip, further achievements can be expected from collaboration with firmware engineers and designers of other component circuits.

④ Open Category

■ Grand Prix

Coin-Size Vibrational Energy Harvester for IoT Network Society

NMEMS Technology Research Organization (NMEMS TRA)

New Energy and Industrial Technology Development Organization (NEDO)

(Exhibit Area: General)

Outline

For IoT society to become a reality, vast numbers of tiny wireless sensors must be connected to the Internet. However, they will not operate if the batteries run out or cannot be charged. To avoid this reliance on batteries, these two organizations created a miniature device that can convert the slightest vibration around us into electrical energy. This compact power generator, which combines technologies used to make smartphone sensors and microphones with a newly developed power generation technology, offers the highest energy recovery efficiency in the world.

Assessment

The number of skilled inspectors is decreasing owing to declining birth rates and the aging population, so there is an urgent need for the automation of social infrastructure inspection work. In manufacturing plants there is also a need for automated daily checks of equipment and facilities using sensors that replicate the human senses of an expert. Moreover, to maintain and improve productivity in this “new normal” era, manufacturing needs to become more resilient to such threats as the coronavirus pandemic, floods, and typhoons. For this, reliable data, which is the foundation of knowledge-intensive industries, is essential. To collect the data, vast numbers of IoT wireless sensors are needed, and this power generation technology is expected to meet the demand for practical “energy harvesters” to power sensors. Also highly evaluated was the fact that this technology is expected to be used for wearables in the future.

■ Semi Grand Prix

Wideband Ultrasonic Transducer

Murata Manufacturing Co., Ltd. (Exhibit Area: General)

Outline

We stand on the threshold of an era in which autonomous vehicles, drones, and other robots will be widely used in consumer and commercial applications. For these and other applications, accurate contactless detection of a device's surroundings are essential. As a solution, this transducer generates sound waves through heat, unlike conventional speakers, enabling it to produce a wide range of sound waves with little reverberation. Combined with signal processing, this technology can be used for precise positional detection, material detection, and close-range detection, thus contributing to enhanced convenience.

Assessment

As an image sensor, this transducer can be used for sensing in the dark, detecting transparent objects, and ensuring privacy. It can also detect small objects and objects with low reflectivity, such as cardboard, for which millimeter wave radar is not suitable. There are many other types of sensors available, and if used in combination with them this transducer can compensate for their weaknesses to enable even more advanced sensing. We can expect to see the development of a wide range of applications for these sensors in the future. Highly evaluated was the potential of this technology to contribute to society as a technology suited to the demands of the "new normal", including contactless user interfaces and the detection of pulse and other vital signs.

⑤ Co-Creation PARK Category

■ Grand Prix

Early Detection of Gastric Cancer using Endoscopic AI

AI Medical Service Inc.

New Energy and Industrial Technology Development Organization (NEDO)

(Exhibit Area: General)

Outline

Gastric cancer is difficult to detect because it typically occurs in patients already suffering from gastritis. Indeed, 5% to 24% of gastric cancers go undetected. The endoscopic solution developed by these two organizations makes use of both real-time and still images, and provides AI support for detecting and differentiating lesions. It thus enhances the accuracy of endoscopic diagnosis and reduces the burden on medical staff. AI-based diagnosis is very fast, taking just 0.02 sec per image, and accuracy is 94.3%, equivalent to that of a specialist.

Assessment

Gastrointestinal endoscopes are one of Japan's leading medical devices: three Japanese manufacturers account for 98% of the global market, so there are high hopes for sustainable and seamless expansion in overseas markets. Ongoing technical development is aimed at applying this technology to the detection and differentiation of cancers of the esophagus and colon. Furthermore, R&D work is also focusing on applying AI to the images captured by capsule endoscopes; such examinations are now covered by insurance in Japan under the 2020 medical fee schedule. Because gastric cancer is difficult to detect, early detection through regular screening is important. Highly evaluated was the fact that this technology is expected to benefit the country as a whole by contributing

to effectively reducing both medical costs and the number of patients dying from stomach cancer. Endoscopic AI is also expected to benefit countries and regions where there are not enough specialists available to provide instruction, allowing young doctors to train and gain experience.

■ Semi Grand Prix

No products or projects were awarded the Semi Grand Prix.

CEATEC AWARD 2020: Award categories and judging criteria

Candidates eligible for CEATEC AWARD 2020 review are projects, technologies, products, and services, as well as supporting software, applications, components, and devices exhibited at CEATEC ONLINE 2020 that have been registered in advance by the exhibitors.

（1）CEATEC AWARD 2020 The Minister of Internal Affairs and Communications Award

The Minister of Internal Affairs and Communications Award recognizes candidates deemed to have contributed significantly to the improvement of living standards and society as a whole via digital transformation in the “New Normal” age. Candidates will also be determined by the ability to enhance the efficiency of economic activities and promote added value by advancing the CPS/IoT community and realization of Society 5.0. This includes but is not limited to the innovative utilization of information and communications networks, data, AI technologies, and IoT technologies in the age of IoT and Big Data, as well as the formation of services based on the aforementioned technologies for use in local communities.

（2）CEATEC AWARD 2020 The Minister of Economy, Trade and Industry Award

The Minister of Economy, Trade and Industry Award recognizes the most innovative candidates with dynamic market potential that have contributed significantly both to the advancement of the CPS/IoT community and the realization of Society 5.0.The candidates will additionally possess the creativity and marketability to stimulate digital transformation in the “New Normal” age while finding solutions for issues facing next-generation lifestyles, businesses and industries. Other judging criteria include the ability of candidates to ensure new value using AI, robotics, and Big Data as well as create transformational approaches to manufacturing via services utilizing IoT and the development of technology to promote IoT across diverse fields.

（3）CEATEC AWARD 2020 Category Awards

① New Normal Solutions Category: One Grand Prix, One Semi Grand Prix Awards

These awards recognize original and practical exhibits/projects that provide innovative solutions and services to sustain and further enhance lifestyles in the “New Normal” age.

② Elemental Technologies and Devices that Support the New Normal Society Category: One Grand Prix, One Semi Grand Prix Awards

These awards recognize elemental IoT technologies and devices as well as the ideas behind them that are used to sustain and develop society in the “New Normal” age. Candidates are also evaluated on criteria such as innovation, technological advancement, and superior applicability to products and services.

③ Digital City Planning in The Age of The New Normal Category: One Grand Prix, One Semi Grand Prix Awards

These awards recognize projects that promote the co-creation of technologies and services, which encourage local governments and industries to work together to propose and develop smart cities at the forefront of societies in the “New Normal” age. Candidates will also be judged on criteria such as their contributions to societies of the future as well as feasibility and innovation.

④ Open Category: One Grand Prix, One Semi Grand Prix Awards

These awards recognize IoT and related technologies, products, services, software, applications, and business models judged to be superior in terms of feasibility, contribution to society, technological sophistication, marketability, etc.

⑤ Co-Creation PARK Category: One Grand Prix, One Semi Grand Prix Awards

These awards recognize innovative applications from start-up companies, universities and research institutes used to develop and realize not only IoT but other related technologies, products, services, software, and business models. Candidates judged as superior from definitive perspectives such as practicality, contribution to society, technological sophistication, and marketability will be considered for the awards.

CEATEC AWARD 2020 review board panel of judges

Chairman of the Review Board:

- Waichi Sekiguchi (President, MMRI)

Review Board Panel of Judges (alphabetical order):

- Yutaka Ake (Director, Digital Media Bureau, Nikkan-Kogyo Shimbun)
- Kotaro Asai (Information Processing Society of Japan)
- Tetsushi Hayashi (Director of Consulting, Nikkei BP Research Institute)
- Koji Michishita (Director, R&D Management, Institute of Electrical Engineers of Japan)
- Makoto Nishisaka (Director, ST Editorial Division, Professional Media Business Headquarters, IT Media Inc.)
- Hideo Saito (Vice President, Institute of Image Information and Television Engineers)
- Akio Yamada (Director, Public Relations and International Affairs, Institute of Electronics, Information and Communication Engineers)
- Asuka Yazaki (Chief Editor, Engadget Japan, Verizon Media Japan KK)

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