

ITRI TODAY

95

Winter Issue 2018

INDUSTRIAL CO-CREATION TO DISCOVER BLUE OCEANS

贏向新藍海 產業創新國際論壇



ITRI 45th Anniversary Special Report II



Startup Story



R&D Focus



Activity



» Special Report

ITRI 45th Anniversary Forum: Industrial Co-Creation to Discover Blue Oceans



Video of ITRI 45th Anniversary Forum.

ITRI hosted an international forum themed “Co-Creation to Discover Blue Oceans” in Taipei on September 19th, attracting over 300 participants to attend. The forum invited representatives of foreign offices such as American Institute in Taiwan, British Office Taipei, and Japan-Taiwan Exchange Association, Taipei Office to touch on the latest industrial technology policies in their respective countries and pinpoint cooperative opportunities in focal industries. Executives from NVIDIA, DOCOMO Technology, Merck, and Corning were also invited to address future trends and share the success stories of their cooperation with ITRI. Invited speakers include Dr. Deepu Talla, Vice President & General Manager of Autonomous Machines, NVIDIA Corporation; Mr. Seizo Onoe, Chief Technology Architect of NTT DOCOMO INC. and President of DOCOMO Technology Inc.; Dr. Rajiv Rana, Head Medical Affairs Asia Pacific at Merck Group; and Dr. Gautam Meda, Division Vice President and Director, Modeling and Computational Science, Corning Research & Development

Corporation. The forum aims to drive Taiwan's industry to expand its innovation capacity, seize international cooperation opportunities, and find a niche market.



The forum attracted more than 300 participants, including many enterprise executives and industry experts.

R.O.C. Vice President Chien-Jen Chen attended the opening ceremony of the forum and made remarks. “It is pleasant to see so many industry experts from Taiwan and abroad join this event and have a shared interest in the prospects for Taiwan industry. I am confident that Taiwan's industrial development will scale new heights with everyone’s participation and support,” he said. Chen expressed his belief that the forum will be inspiring and helpful for underpinning the transformation and upgrading of industry in Taiwan.

Dr. Chih-Kung Lee, ITRI Chairman stated that ITRI is able to serve as an effective bridge in linking international resources and is a world-class think tank as well as a backbone for Taiwan industry. It strives to hasten the momentum of innovation-oriented R&D among the industrial, academic, and research sectors, with the aim to enable Taiwan’s industry to leverage its key advantages and identify blue ocean opportunities. He said ITRI is honored to invite its global partners to participate in the forum and hopes that their insights will inject innovative vigor into Taiwan’s industries and accelerate their move onto the world’s market.

In the keynote speech, Dr. Talla talked on the topic “A New Era of

Computing Powered by GPUs and AI,” indicating that artificial intelligence in the form of deep learning is transformative, and that GPU computing has emerged as the standard of accelerated computing by increasing performance at Moore’s law squared. He further illustrated how NVIDIA’s work in high-performance computing and AI influences autonomous vehicles, robotics and intelligent video analytics.

Mr. Onoe delivered his speech on “Evolution from the Past to the Future beyond 5G”, Dr. Rana discussed the benefits and challenges of AI applications in healthcare, and Dr. Meda spoke on the natural partnership between Corning and ITRI. In the panel discussion moderated by Yin-Chuen Wu of CommonWealth Magazine, panelists shared their thoughts on the future trends of innovations, discussed the desirable potential and advantages in Taiwan, its possible collaborations with global partners, and the blue ocean opportunities.

Click below to learn more about each session.



A New Era of Computing Powered by GPUs and AI



Evolution from the Past to the Future Beyond 5G



AI in Healthcare, Today and the Future!



Corning and ITRI: A Natural Partnership



Navigating the Future of Innovations



Global Networking Facilitates Versatile Collaboration



» Special Report

A New Era of Computing Powered by GPUs and AI

In the keynote speech, Dr. Deepu Talla, Vice President & General Manager of Autonomous Machines, NVIDIA Corporation, stressed that artificial intelligence in the form of deep learning is transforming, and that GPU computing has emerged as the standard of accelerated computing by increasing performance at Moore's law squared. He further illustrated how NVIDIA's work in high-performance computing and AI influences autonomous vehicles, robotics and intelligent video analytics.



Dr. Deepu Talla, Vice President & General Manager of Autonomous Machines, NVIDIA Corporation.

The progress of GPU computing is one of the reasons why AI and deep learning can rapidly advance and be deployed in more areas. Dr. Talla listed the three chapters in AI: the first chapter is about training and creating neural networks, followed by the second which is inference, or deploying the neural networks. Dr. Talla pointed out that in fact we are all using some form of AI inference. For instance, when we are doing a Google

search, the request from our mobile device is sent to the cloud where the neural network runs.

The third chapter, which is also the chapter he is the most excited about, is about bringing AI from the cloud to industries, machines, and devices. This new development brings forth a new generation of machines—the autonomous machines, which will level the playing field for industries. The trend will also offer a lot more business opportunities, as these new machines and devices require the collaboration of various industries and professionals, such as sensor industries and engineers and programmers.

Dr. Talla then provided three examples of AI applications: autonomous vehicles, robotics, and video analytics for smart cities. He indicated that safety is the first and foremost thing to consider when developing a self-driving car, and this includes the ability to not only protect the driver and passengers inside the vehicle, but also to detect pedestrians and other obstacles in the road. NVIDIA's platform provides a safe space for engineers and manufacturers to train the vehicle's neural networks and run them through scenario simulations so that the autonomous vehicles can drive safely on actual streets.

Robotics is more sophisticated than autonomous vehicles, as Dr. Talla explained, because autonomous vehicles only need to go from point A to B without touching anything, but robots have to perform more complicated tasks. In addition, industrial robots usually need to work in close proximity with humans, therefore proper training before deployment is extremely important. NVIDIA offers a simulation platform and toolkit for developers to safely train their robots in a virtual environment.

The third application of AI is in active video analytics to build smart cities. Technology that is capable of processing and analyzing large amounts of camera footage is needed to provide insight for policy making and other functions.

“The third chapter of AI is fresh. All of us have a chance to write it in the next 10 to 20 years,” concluded Dr. Talla. “It's all about bringing AI and deep learning into industries.”

» Special Report

Evolution from the Past to the Future Beyond 5G



Mr. Seizo Onoe, Chief Technology Architect of NTT DOCOMO INC. and President of DOCOMO Technology Inc.

Mr. Seizo Onoe, Chief Technology Architect of NTT DOCOMO INC. and President of DOCOMO Technology Inc., gave a brief presentation on the development of 5G technology in ITRI's 45th Anniversary Forum. Mr. Onoe emphasized that 5G is aimed at meeting a wide range of requirements such as enhanced mobile broadband, massive connections, and super low latency communications. With these three key features, 5G technology is expected to stimulate new business models and ecosystems across industries.

Mr. Onoe expressed that the 5G boom started in 2015. Originally he urged people to calm down, but now he would say "get on the 5G bandwagon". This is because the 5G boom has continued to grow, involving other verticals and attracting interest from a wide range of industries. DOCOMO, for example, has been expanding 5G applications by collaborating with

different sectors such as automation industries, remote control of vehicles, security zones with image analysis, and 5G telemedicine.

He further shared some of his observations on 5G economics and technologies and dispelled some myths about 5G. One of the major misconceptions of deploying 5G is that it would require huge investments; especially for the mobile operators, they worried about a sudden increase in capital expenditure (CapEx). To address this concern, Mr. Onoe illustrated DOCOMO's CapEx in the past 20-year period as an example, showing that new generation technology launches did not necessarily impact CapEx and the data transmission trajectory actually went up. Moreover, the company achieved incredible capacity increase thanks to the new generation technologies. But still people were not convinced, Mr. Onoe said, because many believed that 5G is just a hot spot system with short coverage, so in order to cover the whole market, it would require a lot of infrastructure. Here Mr. Onoe admitted that one single technology cannot solve all of the problems, thus cross-industry collaboration is required. For example, businesses in Taiwan have to work together and integrate to make 5G successful.

Lastly, Mr. Onoe introduced a prediction derived from the second law he proposed himself on mobile communications technology: great success only happens in even-numbered generations, e.g. previous generations like 2G and 4G had great success. But he stressed that cross-industry collaborations can lift up 5G to great success despite the second law's prediction. He further introduced the third law: the advent of next generation services occurs after the next generation network launches. He indicated that this phenomenon is observed among the previous generations. However, DOCOMO is now trying to create 5G services before 5G launches through collaboration with partners. The company is also working on expanding their business opportunities to discover the blue ocean through 5G projects and its 5G open partnership program.

Mr. Onoe concluded that by “getting on the 5G bandwagon” and “creating 5G services before 5G launches”, we will be able to beat the second law for a great success of 5G through cross-industry collaboration.

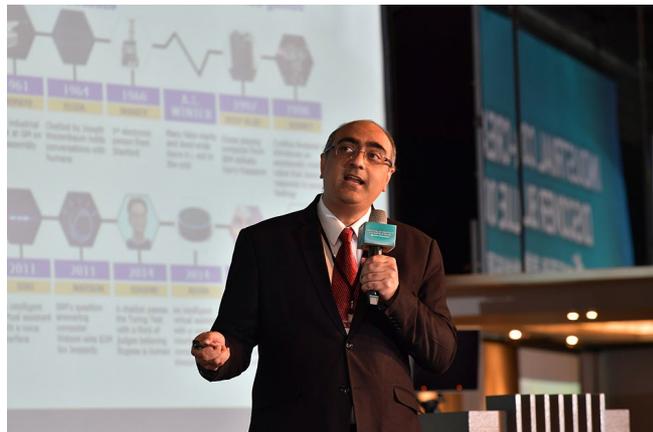


» Special Report

AI in Healthcare, Today and the Future!

Dr. Rajiv Rana, Head Medical Affairs Asia Pacific at Merck Group, was invited to share his view on AI applications in healthcare. In his speech, he analyzed the current AI healthcare market and illustrated how AI technologies are impacting the industry, expressing his optimism about the transformative power of AI in healthcare.

According to Dr. Rana, the top three AI applications that are expected to grow in terms of revenue by 2026 are robot-assisted surgery, virtual nursing assistance, and administrative work assistance. He pointed out that at the moment non-autonomous robots are mostly used in orthopedic



Dr. Rajiv Rana, Head Medical Affairs Asia Pacific at Merck Group.

and GI surgery. There are also virtual reality applications for training new doctors. Virtual nursing assistance robots, an application that is estimated to increase to US\$20 billion by 2026, are already available and mostly used in elderly care. Administrative work assistance applications will help optimize administrative processes in clinics. Dr. Rana mentioned that radiomics, or image analysis, is an increasingly popular field in healthcare. This technology can analyze medical images and help predict whether the patient is susceptible to certain diseases.

In the fields of drug manufacturing and treatment, AI can be deployed to predict side effects and toxicities, define action of drugs, and assist in repurposing to streamline drug production procedures. “Repurposing is a new and exciting area; it means using existing treatments on new diseases,”

remarked Dr. Rana. “Because pharmaceutical companies have full databases of drug chemical structures and proteins, image analysis can help researchers understand which existing drugs can be used to treat different diseases,” he explained.

Dr. Rana stressed that Merck Biopharma, through partnerships, is also leveraging AI technology to improve patient-centric healthcare services. This includes using computer-vision software to speed up drug development, and machine learning to deliver precision medicine and improve patient outcomes. The company’s current focuses, in terms of drug development, are immunology, oncology, and immuno-oncology.

Nevertheless, AI is not without its shortcomings. Deep learning requires a large amount of data, yet in the healthcare industry, data collection may be limited by data standards and privacy. In addition, machines learn through algorithms and thus may be subject to biases. “Therefore they can never fully replace a scientist or surgeon,” Dr. Rana said. There is a need to validate the AI output, and that is why many countries are setting up authorities to evaluate the output of related AI applications.

Dr. Rana pointed out that around 106 startups are adding value to various sectors in the healthcare AI industry, and he sees a lot of hope for precision medicine in the future once the system is connected to other databases. Finally, he stressed that the future is all about co-creation and collaboration. The stronger we collaborate, the more success we can achieve in the space of blue oceans.



» Special Report

Corning and ITRI: A Natural Partnership

Dr. Gautam Meda, Director of Modeling and Computational Science at Corning Research & Development Corporation, talked in his speech about the partnership between Corning and ITRI. He indicated that Corning has enjoyed an easy, mutually beneficial, and natural partnership with ITRI for many years. Owing to the common values and complementary skills both sides share, it is natural for the two to work together. He then illustrated his points by first briefly introducing Corning.



Dr. Gautam Meda, Director of Modeling and Computational Science at Corning Research & Development Corporation.

Corning is a 165-year-old company with one of the oldest R&D labs in the world. It possesses leading expertise in organic materials, optical physics, and telecommunications, which can change life. For instance, in 1879, Corning invented a crucial machine to mass produce the glass casings of light bulbs with relatively low

cost, making light bulbs available to the mass public. Dr. Meda pointed out Corning not only invented items that were needed, such as the light bulb casing, but also items which are well before their time, for instance, the LCD glass in 1982.

Dr. Meda listed the shared values between Corning and ITRI. He said both organizations are constantly reinventing and self-disrupting: ITRI plays a major role in doing this in Taiwan's technology industry, while Corning often takes part in initiating changes. Both sides embrace new paradigms and methods, and are patient with their R&D processes. He also mentioned

the fact that ITRI incubates ideas and takes risks that smaller companies in Taiwan cannot afford to take, just as Corning encourages the boldest imaginations. In addition to the fervent pursuit of science and focus on practical application, both organizations value deep customer engagement. The exchange of people, including leaders, between ITRI and industries creates a natural engagement between research facilities and actual industries.

Dr. Meda closed with a successful collaboration example between Corning and ITRI to illustrate how well the two partners work together—a roll to roll production process for thin glass. Corning was glad to engage ITRI's technical ability, and in 2012 this collaboration presented the world's first demonstration of complete roll to roll process for electronic devices.

» Special Report

Navigating the Future of Innovations



Panelists discussed blue ocean opportunities of Taiwan's industry.

The panel discussion was centered on how industrial co-creation can lead to blue ocean opportunities in Taiwan. ITRI President Dr. Edwin Liu first shared his vision on the trend of future technology. He said that recent natural disasters show that humans can never win against Mother Nature, so we must learn to co-exist with the environment and move towards a self-sustaining community. According to Dr. Liu, sustainability will be crucial, which involves the development of shared economy, circular economy, renewable energy, and AI. He also pointed out that instead of focusing on strengthening the system, we should work on the resilience of the system, i.e. not to build a system that will never fail, but a system that can recover very fast.

When asked about possible collaborations with Taiwan or ITRI, Dr. Deepu Talla, Vice President & General Manager of Autonomous Machines,

NVIDIA Corporation, remarked that ITRI has many researchers working in all sorts of fields, and the institute has cross-discipline research and works closely with industries. Some areas for joint contributions include autonomous vehicles, factory automation, robotics, and smart cities.

Mr. Seizo Onoe, Chief Technology Architect of NTT DOCOMO INC. and President of DOCOMO Technology Inc., expressed that Taiwan is a good place for innovations, and ITRI can help expand the existing strong industries. Mr. Onoe also mentioned his dream: to set up a network of microservice mobile bases with millimeter waves. He admitted that while it is theoretically possible, there are still many hurdles before the actual implementation of this project; therefore he looks forward to DOCOMO's collaboration with ITRI and Taiwanese companies to come up with solutions.

Dr. Rajiv Rana, Head Medical Affairs Asia Pacific at Merck Group, explained that current collaborations between Merck and ITRI are mostly in the biopharma manufacturing arena. Through the partnership, Merck brings training, technology, devices, and international speakers to Taiwan, allowing it to build local capability. Other partnership opportunities are in research infrastructure, which has grown significantly in the last five years. In terms of cancer research, Taiwan has the advantage of having bio banks and huge databases, which can speed up the entire drug discovery process.

Dr. Gautam Meda, Division Vice President and Director, Modeling and Computational Science, Corning Research & Development Corporation, added some advantages of collaborating with Taiwan. He mentioned that Taiwan has a very well-educated and well-trained workforce. The researchers are very comfortable working internationally, and organizations like ITRI have a long-term focus, which will benefit the production of cooperative R&D results.



» Special Report

Global Networking Facilitates Versatile Collaboration

Marking a 45-year milestone, ITRI realizes the importance of collaboration and is more than grateful for the support from its global partners. Without solid partnerships and close connection to the world, it is unlikely for ITRI to reach its height, leading Taiwan's technology innovation and industrialization. In the forum "Industrial Co-Creation to Discover Blue Oceans", representatives of foreign offices including British Office Taipei, Japan-Taiwan Exchange Association, and American Institute in Taiwan were invited to share their experience in working with ITRI and promoting the collaborations between Taiwan and their countries.

“



Every success relies on strong partnerships. Over the past few years, ITRI has established strong partnerships with various parts of the world, and we're very pleased that UK is part of that. We have some incredible success stories together from groundbreaking new treatments for serious medical illnesses to innovative, new options for generating and storing energy. These collaborations are not only strengthening the relationship between British institutions with ITRI, but also making contributions to the well-being of the world in the future.

”

Ms. Catherine Nettleton
Representative, British Office Taipei

“



We have a good relationship between Japan and ITRI. For example, ITRI and Japan's AIST have a joint collaboration project: ITRI-AIST R&D Collaboration Space. ITRI is also very famous in its incubation center for startup industry, which is a good learning model for Japan.

”

Mr. Mitsuhiro Yokota
Deputy Representative, Japan-Taiwan Exchange Association, Taipei

“



ITRI has contributed to an international culture of innovation both through its own research and by helping foreign companies establish successful research facilities in Taiwan. We at the American Institute in Taiwan take great pride in our relationship with ITRI and look forward to expanding collaboration between U.S. companies and research institutes and ITRI.

”

Ms. Helen Peterson
Commercial Section Chief, American Institute in Taiwan

» Startup Story

eTreego Provides Reliable EV Charging Solutions

Electric vehicles (EVs) are taking the world by storm. Many countries are already legislating the zero-emission future for automobiles, which has prompted the sales growth for EVs worldwide. According to statistics from ITRI, in 2017, a total of 2.66 million electric cars were sold globally; this year, with the estimated sales growth of 19%, the number is expected to reach 3.17 million. The electric scooter market has shown an even higher growth; 549,000 electric scooters are expected to be sold across the world in 2018, a 60% increase over last year.



eTreego President Gin-Pin Chien founded his EV charging business in 2017.

eTreego's EV Charging Technologies

Seizing the booming opportunities of the global EV market, ITRI startup eTreego started its business in 2017, providing a total solution for EV charging. With more than 10 years of technical development experience, the eTreego team possesses the core competence in developing EV charging

technologies. It offers a wide range of products for the charging of electric cars and scooters, including charging control modules, chargers, charging stations, and energy management. All the products conform to major international standards such as SAE, IEC, CHAdeMO, and GB. Moreover, these products are built with high durability, allowing them to perform in a temperature range of -40°C to 70°C , whereas other similar products can only work in the range between 0°C to 60°C .



eTreego developed a wide range of products for EV charging, including charging control modules, chargers (image above), charging stations, and energy management.

Not long after the founding of the company, eTreego has already made big strides in Taiwan's EV industry. "Our team took part in formulating the charging standard for electric cars and scooters in Taiwan, and we also built Taiwan's first electric car charging pile. This is our value proposition in the market," said Gin-Pin Chien, President of eTreego in an interview. As of now, more than half of the EV charging piles in Taiwan are built by eTreego.



Electric car charging pile developed by eTreego.

eTreego's Business Expansion & Future Outlook

According to Chien, the company's priority is to target the domestic automotive and scooter manufacturers to grow its business. "Getting recognition from local industry is a cornerstone to our business expansion in overseas markets," he said. Designed with high safety standard and reliability, eTreego's products have been adopted by Taiwan's leading carmakers such as Yulon Motor and China Motor. eTreego is also working with a number of electric scooter manufacturers in Taiwan on charging products that comply

with the national standards. The company will strive to collaborate with international carmakers and related charger vendors to cover more markets.

To further expand its product offerings, eTreego is now actively developing an all-in-one network system that is small-in-size and allows bi-directional charging, wireless charging and quick charging. This development will not only diversify the product line but also add more competitive advantages to help eTreego stay ahead of the market.

» R&D Focus

ITRI Takes Lead Role in Measurement Standards with Si-Sphere



The Silicon Sphere Transfer Ceremony was held on October 24.

The International System of Units (SI) plans to use the Planck constant to redefine the kilogram, with the new definition taking effect on May 20, 2019, a revision made for the first time in over 100 years. ITRI was actively engaged in the revolution in SI and purchased a Si-Sphere from the world-leading metrology institute, Physikalisch-Technische Bundesanstalt (PTB), to mark a milestone in pursuit of precision standards in mass measurement. On October 24, a silicon sphere transfer ceremony was held to welcome the successful introduction of a Si-Sphere into Taiwan, followed by a workshop that discussed related developments in mass measurement.

The President of ITRI, Edwin Liu, stated that ITRI has been dedicated to maintaining Taiwan's establishment in measurement technology and standards for the past three decades. The new definition of the kilogram will be based on the Planck constant by using the Si-Sphere method rather than an artefact. ITRI is proud to take the initiative of introducing the Si-

Sphere, which puts Taiwan on a par with all leading national metrology institutes and ensures its international position in precision measurement.

The Director-General of Bureau of Standards, Metrology and Inspection (BSMI), Ming-Jong Liu, remarked that 2018 undoubtedly marks one of the biggest challenges in a century for the metrology sector. The BSMI has strongly supported ITRI's endeavor to adopt the new measurement standard for the kilogram, hoping to promote development of the high-tech sectors and enable industries' access to high-accuracy measurement data.

President of PTB, Joachim H. Ullrich, pointed out that the impact of the kilogram redefinition will resonate throughout industry especially in precision industries such as semiconductors, energy, aerospace, and medicine. He further stressed that PTB is pleased to embark on an exciting journey together with ITRI in establishing the dissemination of the unit mass in the revised SI. According to Dr. Ullrich's view, ITRI will now have the in-house capability to not only contribute its measurements of the kilogram to international key databases, but also calibrate mass standards across a large range of the mass scale. He believes that ITRI will play an important role in providing the critical traceability to the SI in the long-term and become a lighthouse in the Asian region for disseminating the unit mass.

Dr. Tzeng-Yow Lin, General Director of ITRI's Center for Measurement Standards and Director of the National Measurement Laboratory (NML), stated that with the new SI, the 1kg standard based on the platinum-iridium alloy cylinder, the international prototype kilogram (IPK), will be relegated to a secondary standard. ITRI's acquisition of the Si-Sphere will maintain the highest measurement standards and ensure Taiwan's ability to engage in mass measurements on its own.

Taiwan is home to many high-tech industries that require world-class measurement standards. In this regard, ITRI and NML believe that the implementation of the revised SI will provide quality assurance and traceability for these businesses. Taiwan's prominence in the new kilogram standard will also allow it to offer services to other Asian nations and promote the upgrade of industry.



Si-Sphere Method

The Si-Sphere method defines a kilogram in terms of the Planck constant. It offers exact calculation of the mass of the silicon sphere by counting the number of atoms in the sphere. Using natural silicon and following the multiple processes of purification, crystal growth, cutting, grinding and polishing, a ^{28}Si -Sphere with a purity of over 99.99%, diameter of 93.7 mm and perfect roundness to within a couple dozen nanometers has been fabricated. Counting the number of silicon atoms in this silicon sphere and then multiplying them by the average mass of a single atom realizes the value that is then calculated to determine the mass of the silicon sphere.

» R&D Focus

HiLLO-ORC Turns Low-Temperature Waste Heat into Electricity



Video of HiLLO-ORC.

Heat loss is a major challenge in the process of power production when primary energy is converted into useful forms of energy. A study shows that around 72% of the global primary energy consumption is lost after such energy conversion and that 63% of the considered waste heat streams is generated at a temperature below 100°C. Thus, recovering waste heat, especially low-temperature waste heat, is the key to increasing the overall efficiency of power generation and industrial processes, and ultimately lowering the fuel demand. In order to make better use of the low-temperature heat, ITRI has developed the HiLLO-ORC (High-efficiency/Low-temperature/Low-cost Organic Rankine Cycle) system, a semi-hermetic expander technology that converts low-temperature waste heat into electricity in a cost-effective way.

ITRI's HiLLO-ORC system is focused on the improvement of efficiency and cost—two crucial factors to be considered when using an ORC waste heat

recovery system. Its feature design includes a semi-hermetic expander with a turbine-rotor subsystem, an optimized evaporator, a condenser, and a smart control system. The system enables a highly efficient operation without energy loss of the seal for separating the refrigerant and the waste heat flow. The refrigerant flows through the shell outside the rods to absorb the waste heat water or air in the evaporator. It is then evaporated at a low temperature below 100°C and becomes a high-pressure flow to drive the turbine to generate electricity with extreme efficiency. The closed loop allows the operation to work in an environment-friendly and economical manner. The semi-hermetic expander of the HiLLO-ORC system is a re-invention of the semi-hermetic compressor that has been commonly used in the refrigeration and air-conditioning industries. It is able to lower the cost of the system, providing a competitive return on investment (ROI).



A primary demo site of HiLLO-ORC.

ITRI has been dedicated to the commercialization of the HiLLO-ORC technology and is continuing to work with various sectors, such as the biomass, food processing, and solar energy industries for low-temperature waste heat recovery. With the support of Taiwan's Bureau of Energy, four primary demo sites have been established, including a 125 kWe paper mill, a 200 kWe chemical plant, a 200 kWe steel refinery, and a 300 kWe geothermal farm. This technology was selected as a Top 100 for 2018 Create the Future Design Contest by NASA Tech Briefs magazine.

» Activity

MEDiT 2018 Unveils New Opportunities in Smart Healthcare



MEDiT 2018 took place in Taipei.

The 2018 Medical Electronics & Device in Taiwan Forum (MEDiT) held in October in Taipei centered on the theme “Empowering Smart Healthcare Through Cross-industry Synergy: The New Paradigm.” Among the invited speakers were Ozgur Baydarol, R&D Manager at Turkish household appliances maker Arçelik A.Ş.; Yoichiro Hamazaki, General Manager of the IT Healthcare Project at Japan’s Teijin Ltd.; and Samuel Ding, former Research Director at Baxter Healthcare. These experts shared their insights on smart healthcare and market trends, which would pave the way for greater cross-industry synergy and help firms seize blue ocean opportunities.

The Industrial Development Bureau of the Ministry of Economic Affairs pointed out the enormous global market potential of Taiwan-made medical devices. In a bid to boost its visibility in international markets, Taiwan continues to strengthen innovation-oriented R&D in the biomedical

industry, while also promoting smart medical devices and systems. It hopes to utilize the advantage of the industrial clusters here to make Taiwan an Asia-Pacific hub for innovative R&D in biotechnology, pharmaceuticals, and medical devices.

Dr. Chii-Wann Lin, ITRI's Vice President and General Director of Biomedical Technology and Device Research Laboratories, remarked that ITRI aims to foster an innovation ecosystem and biomedical clusters in response to the government's 5+2 Innovative Industries Plan. He further illustrated ITRI's efforts in promoting the growth and export of high-end medical devices. For instance, ITRI's startup Somnics, which developed a device to treat Obstructive Sleep Apnea (OSA), has obtained the permit to sell its product in Malaysia, a successful attempt to tap into the ASEAN market.

A number of experts also attended this year's forum. Jane SC Tsai, Senior Vice President for International Affairs at YFY Biotech Management Company, discussed new business models and opportunities associated with the use of AI and Big Data in medical devices offering smart diagnosis. Doris Tseng, Senior Business Consultant at the Taiwan-USA Industrial Cooperation Promotion Office, provided Taiwanese companies with suggestions on how to create sales networks for smart medical devices in the U.S. healthcare system. Yi-Sung Kuo, COMDEK Industrial Co. Chairman, shared his firm's experience in discovering business opportunities in Asia-Pacific emerging markets.

This year marks the 11th anniversary of MEDiT, with the forum having become the premier international event for Taiwan's medical device industry. Besides introducing the emerging global business models for healthcare and medical devices and providing insights about key markets in Europe and the U.S., business matchmaking meetings were arranged for the second day, offering the opportunity for one-on-one talks between domestic manufacturers and international sales channels. These meetings promoted substantive business interaction, with the hope of assisting Taiwan firms in expanding their presence into international markets and becoming part of the global business value chain.

» Activity

ITRI Wins CES Innovation Awards for Second Consecutive Year



ITRI's Hybrid Power Drone with High Payload and Duration and ELECLEAN's Disinfectant Spray were both named CES 2019 Innovation Award Honorees.

ITRI has won the CES Innovation Awards for two consecutive years. Its [Hybrid Power Drone with High Payload and Duration](#) was named a CES 2019 Innovation Award Honoree in the Robotics and Drones category, and its spinoff ELECLEAN received the same honor with [ELECLEAN Disinfectant Spray](#) in Home Appliances. The two honorees will be on display at both the CES 2019 Innovation Awards Showcase (Venetian Ballroom E/F, the Venetian, Tech West) and Taiwan Excellence ([#20636 South Hall 1, LVCC, Tech East](#)) in Las Vegas during January 8-11, 2019.

The annual CES Innovation Awards program honors outstanding product design and engineering in brand-new consumer technology products. According to the Consumer Technology Association (CTA), honorees are those whose products scored highly across all judging criteria, including engineering, aesthetic, and design qualities, user value, positive impact to quality of life, and competitiveness in the marketplace. This year's

honorees include leading companies such as NVIDIA, Honeywell, and Sony.

“This marks the second year in a row that ITRI has been named the CES Innovation Awards Honoree. We are very excited that ITRI’s market-oriented R&D achievements can stand out at CES, the global stage for innovation, which reveals ITRI’s outstanding innovation capability and its commitment to technology commercialization,” said ITRI President Edwin Liu. “We will continue to nurture startups like ELECLEAN and work closely with academia and industries to deliver successful collaboration results such as the Hybrid Power Drone with High Payload and Duration. Our aim is to develop novel solutions and assist industries to solve their problems and create uncontested market space,” he added.

ITRI’s Hybrid Power Drone with High Payload and Duration is an octocopter that can hover up to 45 minutes at 30 kg payload, which is over three times the endurance of a drone powered solely by lithium battery. The drone consists of an optimized carbon fiber reinforced plastics (CFRP) fuselage and a hybrid power system including the lightweight aviation internal combustion engine (ICE) and the high power density electric generator and lithium batteries. The hybrid system, with a power-to-weight ratio of 0.6 kg/kw at 7.5 kw output, is very light and can provide the enormous power demand of the over 3 m axis diameter octocopter. The drone passed a preliminary field test for a smart spray system in a mountainous tea garden in the end of 2017. With high payload, the drone can even carry granular fertilizers, proving its capabilities as an advanced agricultural drone for plant protection. With highly efficient electric propulsion and fault-tolerant autopilot, it can perform robust delivery service and long range infrastructure inspection as well.

[ELECLEAN Disinfectant Spray](#) is a portable device that uses water to produce a disinfectant to kill 99.9% of bacteria and viruses such as H1N1 Virus, Enterovirus, and E. coli. It was developed by ITRI startup ELECLEAN, using the world’s first nano-catalysis electrochemical technology to convert water molecules into reactive oxygen species (ROS) in 15 minutes. ELECLEAN Disinfectant Spray is designed to be eco-friendly and convenient. Without adding chemicals, the device alleviates the need for preservatives, stabilizers, or scents that are common in conventional disinfectants, and thus will not result in skin allergies or dermatitis. Moreover, its user-friendly and compact design makes it easy to use and carry. The ELECLEAN Disinfectant Spray can be applied in homes,

hospitals, restaurants, or schools for multiple purposes including disinfecting surfaces, cleaning hands, or sanitizing pets.

Apart from the above-mentioned technologies, [ITRI's Portable UVC LED Water Sterilizer System](#), an R&D 100 award-winning technology that uses highly energy-efficient UV LED as the light source to provide immediate water sterilization for emergency situations, will also join the exhibition at [Taiwan Excellence](#) (#20636 South Hall 1, LVCC) from January 8 to 11, 2019.



ITRI's highlights at CES 2019.

» Activity

ITRI Receives Three 2018 R&D 100 Awards

Honored for 11th Consecutive Year for Its Technology Innovations



ITRI at 2018 R&D 100 Awards Ceremony.

ITRI received three 2018 R&D 100 Awards on November 16th in Orlando, Florida. ITRI's technologies were selected as winners for innovation in the Software/Services, IT/Electrical, and Mechanical Devices/Materials categories. This year's winners are as follows.

- [Automatic Police UAV Patrol System](#) (Software/Services Category) provides fully automated unmanned aerial vehicle (UAV) police patrols. It significantly boosts efficiency, deployment flexibility and surveillance quality for police, minimizing human involvement and risks during regular patrols.
- [Functional Dyeing Synchronized with CO₂ Supercritical Technology](#) (Mechanical Devices/Materials Category) is a single-bath supercritical fluid dyeing (SFD) process for PET or blended elastic textiles to provide wicking performance. This technology uses supercritical carbon dioxide as the dyeing solvent instead of water, thereby eliminating water consumption and pollution and optimizing textile manufacturing since textiles no longer need drying.

- [Portable UVC LED Water Sterilizer System](#) (IT/Electrical Category) is the world's first solar-powered flow-water sterilizer for emergency use. It efficiently produces clean water by killing water-borne bacteria with UVC LED technology. Unlike mercury lamp disinfection systems, ITRI's sterilizer is mercury-free, energy-saving, compact, and durable.



ITRI received three 2018 R&D Awards on November 16th in Orlando, Florida.



Tim Studt, Panel Judge and Consulting Editor of R&D 100 Awards, commented that ITRI keeps improving the technologies it submits and is looking into different areas that it was not even thinking about five years ago. Laura Panjwani, Editor of R&D 100 Awards, was also impressed that ITRI continues to show great R&D and was delighted to see ITRI's presence at the Awards. "You guys have a lot of innovative stuff coming down the pipeline, and you are really trying to make things that are cutting edge and bring them to this competition," she said.

"We are thrilled to win at R&D 100 Awards once again. I believe these winning technologies will provide a new force for the transformation of

Taiwan's industry," said ITRI President Edwin Liu. "Through our efforts in promoting startups and upgrading industries, we hope these innovative R&D results can be successfully delivered from lab to market, contributing to economic growth," he stressed.

Since 2008, ITRI has received 39 R&D 100 Awards for its outstanding contributions toward innovating a better future for society and pushing the boundaries of what is possible. Many of ITRI's winning technologies have been licensed and commercialized through industry partners. Other R&D 100 Awards recipients this year include MIT Lincoln Laboratory, Los Alamos National Laboratory, Dow Chemical, and NASA.

» Copyright



ITRI is one of the world's leading technology R&D institutions aiming to innovate a better future for society. Founded in 1973, ITRI has played a vital role in transforming Taiwan's industries from labor-intensive into innovation-driven. It focuses on the fields of Smart Living, Quality Health, and Sustainable Environment. Over the years, ITRI has incubated over 270 innovative companies, including well-known names such as UMC and TSMC. In addition to its headquarters in Taiwan, ITRI has branch offices in the U.S., Europe, and Japan in an effort to extend its R&D

Publisher: Edwin Liu

Editor in Chief: June Lin, Jenny Chao

Executive Editor: Irene Shih

Contributing Editors: Dan King, Chloe Chen, Kevin Lai, Yvonne Liu

Photographers: Michael Hsu, Hung-Mou Tsai, Yu-Kai Hsu

Subscription:

<https://www.itri.org/itritoday/subscription>

Inquiries:

E-mail: itritoday@itri.org.tw

Fax: +886-3-582-0494

Archive:

<https://www.itri.org/eng/itritoday>

Published by:

Industrial Technology Research Institute

Rm. 803, Bldg. 53, No. 195, Sec.4,

scope and promote
opportunities for international
cooperation around the world.

Chung Hsing Rd. Chutung,
Hsinchu, Taiwan 310, R.O.C.

Tel: +886-3-582-0100

Fax: +886-3-582-0045

Website: <https://www.itri.org/eng>

© 2018 All rights reserved.

ITRI's Worldwide Offices

ITRI International Inc.

2870 Zanker Rd., Suite 140, San Jose, CA 95134, U.S.A.

Tel: +1-408-428-9988

Fax: +1-408-428-9388

E-mail: seanwang@itri.com

ITRI Japan Office

TTD Bldg., 3F, 1-2-18 Mita, Minato-ku, Tokyo, 108-0073 Japan

Tel: +81-3-5419-3836

Fax: +81-3-3455-5079

E-mail: itritokyo@itri.org.tw

ITRI Western Europe Office

Hohenzollerndamm 187, 7 OG., D-10713 Berlin, Germany

Tel: +49-30-8609-3610~18

Fax: +49-30-8642-0677

E-mail: contact@itri.de

ITRI Moscow Office

125009, Tverskaya str., Bld. 9, block 7, office 205, Moscow, Russia

Tel : +7-499-951-1952

E-mail: contact@itri.ru

ITRI Netherlands Office

High Tech Campus 9, 5656 AE, Eindhoven, The Netherlands

Tel: +31-408-512-242

E-mail: contact_nl@itri.org.tw