Newsletter of YunTech

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Industry-Academia Collaboration

YunTech Professor Chuan-yu Chang 's Team Developed "Zero-touch", a Unique Technology, and Won the 2020 Future Technology Breakthrough Award

The Covid-19 pandemic is raging around the world and has severely damaged the development of the global economy. Under the turmoil of the pandemic, national health awareness has risen. Precision medicine has become an industry actively developing in various countries, and it has also created a "zero-touch" industry business opportunity! Chuan-yu Chang, the director of the National YunTech Smart Recognition Industry Service Research Center and Hui-ming Ma, Deputy Dean of the Yunlin Branch of National Taiwan University Hospital, worked together to develop a unique "zero-touch" detection technology - facial stroke, heart rate and respiration detection technology, and won the 2020 future technological breakthrough of the Ministry of Science and Technology. The award also showed YunTech's outstanding achievements in precision medicine.

Prof. Chang presented at the Taiwan Innotech Expo

A unique world-leading technology which won five invention patents.

The technology researched by YunTech Professor Chuan-yu Chang's team is the world's first to use the "zero contact" detection method that can provide services without any physical contact.

The technology integrates functions such as "facial stroke", "heart rate", and "respiration". By using computer vision, the subject's current stroke possibility and accurate measurement of heart rate and respiration rate can be learned through changes in facial features. This technology overcomes the difficulty of existing

camera devices that have difficulty breaking through the influence of environmental light source changes on the detection results. It also greatly improves efficiency by providing instant, accurate, and convenient zero-contact measurement. This technology has obtained two invention patents in the U.S. and three in the Republic of China and represents major breakthroughs in precision medicine and pandemic prevention technology industries.

Technical description of YunTech's self-driving car team.

The era of zero contact is coming and huge business opportunities should not be underestimated.

Chuan-yu Chang, the director of the Smart Identification Center, indicated that, during the pandemic, the riskiest thing is the physical contact between people. The "zero-touch" test developed by us not only reduces the risk of medical staff being exposed to infection, but can also be integrated into physiological signal measurement systems, baby monitors, and magic mirrors and can be even used in hospital vacuum isolation wards, confinement centers, homes, and other places. At present, the technology has been developed to allow multiple people to be measured at the same time and can thus be applied in densely populated areas in the future. The technology industry has a wide spectrum of operations!

Awards and Commendation

At the International Warsaw Invention Show, YunTech Won 3 Gold and 1 Silver Award

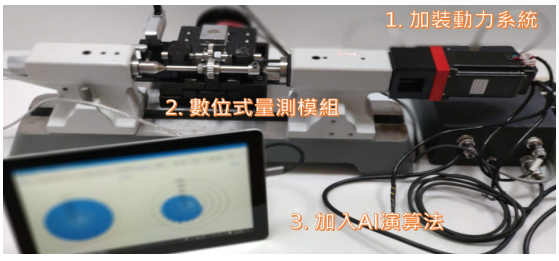
The "International Warsaw Invention Show" is an invention exhibition officially organized by Poland and also one of the international invention exhibitions announced by the International Federation of Inspection Agencies (IFIA). In 2020, at the 13th International Warsaw Invention Show, YunTech exhibited 4 projects and won 3 gold and 1 silver medal.

3 Golds were awarded to

One award went to “Graphene Aerogel Air Fuel Cell,” designed by Dr. Chao-Yin Kuo (Research Team: Po-Jen Tseng, Hong-Kai Jheng, Jia Yao Zhang, and Po-Yan Tseng). This technology has the following advantages: 1. The battery is low in cost and simple in structure; 2. The battery is completely enclosed, sturdy, and durable; 3. The air fuel cell has a high output value; 4. It is safe to use; 5. It does not require frequent maintenance; and 6. It is environmentally friendly and reflects the concept of the green circular economy.

Graphene Aerogel Air Fuel Cell

The second awarded invention was “Upgrade Module with Multi-function Sensors for Eccentricity Measuring Gear Instruments,” designed by Dr. Yung-Cheng Wang (Research Team: Po-Chien Hsu, Meng-Hsun Tsai, Chung-Ping Chang, Syuan-Cheng Chang, and Fu-tun Chang). This technology automatically upgrades the original eccentric gauge to an automatic double tooth flank detection machine and provides high-quality upgrade kits for small and medium-sized enterprises engaged in gear manufacturing, assembly, and related industries.



Upgrade Module with Multi-Function Sensors for Eccentricity Measuring Gear Instruments.

Another awarded invention was “Current enhance of non-enzymatic glucose biosensor based on SWCNTs\ Cu2O /ZnO Nanorods/Graphene hybrid electrode,” designed by Dr. Hsi-Chao Chen (Research Team:

Yun-Cheng Yeh, Wei-Rong Su, Ming-Hsien Yen, and Yu-Hung Yen). The feature of this product is that, once it is commercialized, even elders would be able to use it independently at home with high precision and good stability and through simple operation. For different groups, the product interface is more user-friendly, allowing users to understand it at a glance. It can be used in the optical product manufacturing, medical care, and biotechnology industries and with commercially available portable blood glucose meters and blood glucose test strips.

The silver award went to “Dew Catcher,” designed by Dr. Jui-Ch Tu (Research Team: Yen-Pei Liu, Dong-tai Xiao, Shi-Chen Luo, Hua-Jung Ko, and Yi-Jing Sie). The invention uses low ambient temperature in the morning and night. When the surface temperature of the product is lower than the temperature required for water vapor to condense into liquid water, water droplets will be generated and blown by the wind. The dew is collected in the bird house by the movement or the shaking of the birds when they stop. “Dew Catcher” can therefore be usefully set up for endangered birds in their habitats. Through the daily temperature difference, it can produce drinking water in an infinite cycle, providing the birds with the water they need to help them recover.

Dew Catcher scenario diagram

Academic Exchanges

2020 International Conference on Visual Communication Design & Basic Design Forums

YunTech held the “2020 ICWVCD International Conference on Visual Communication Design & Basic Design Forum” in Room DCB02 of the Department of Visual Communication Design from 8:30 AM to 5 PM on November 6th, 2020. This year’s seminar, which was based on “Inheritance and Innovation” invited domestic and foreign experts, namely Professor Lie Zhao, specializing in composite design at Seoul University’s College of Art in South Korea, Guo-qing Lin, CEO of I AM BRAND DESIGN CO., LTD in Taiwan, and the curator Annie Ivanova, founder of STUDIO IVANOVA in Australia, to share their design experiences and interact with students.

2020 ICWVCD poster

This year’s seminar invited three VIPs to share their personal experiences in the design industry and engage in idea-exchange. Professor Lie Zhao from Seoul University, South Korea, introduced new basic modeling knowledge, specifically focusing on the theme of "Cultural Creative Design Education and Product Development". His model is based on the direction of physical vision and it is as interesting as a puzzle game. Based on his model, the structure used varies depending on the line of sight; that is, the point of view deforms the shape of the structure. Professor Zhao’s approach reflects a spatial modeling experiment; only through an interesting method and expanding perception can one improve creativity. In a three-dimensional space, with constant movement, the angle of observation is different, and of course what you see and feel is also different. In reality, the space design only considers the image seen at a predetermined location, and rarely considers the graphics that change with the location. If you really experience this kind of graphics that change with different positions, you will definitely fall into its amusing charm and won't be able to extricate yourself. In other words, the "three-dimensional modeling experiment that changes the figure with the angle of view" will give those parts of the brain that are not usually active, interesting training and the viewer’s visual perception will also be expanded. In order to cultivate design concepts and improve

creativity, the space modeling experiment is a project proposal that is being developed and utilized.

The curator Annie Ivanova from Australia shared Taiwan's design and culture with "Asian design value in the remix of high-tech and hand-made." Through her local design perspective and her research on "Taiwan Design", she found creative inspiration in the disappearing world of night markets and temple squares - the place and era where people live in harmony with nature, and where the mastery of the craftsmen is recognized. Through contemporary objects full of stories of those who remember life from that time, one is able to explore the classical elements in colonial architecture, reimagine the warmth of traditional homes, and experience life before urbanization. The content of her speech was essentially "Taiwan in Design" and covered the first Taiwan design trade exhibition and trade conference. Other case studies included the plan of a Taiwanese designer, and her plan for creative design in Melbourne, Australia, as well as her perspective on the global stage to promote Asian design, especially Taiwanese design and culture.

The Taiwan representative, CEO Guo-qing Lin, led the attendants in exploring the infinite mystery of Chinese characters through his speech "Retrieving the old and making the new: The infinite possibilities of Chinese characters." Chinese characters are the oldest characters preserved in the world, but they are also the characters with the most creative possibilities. In 2000, the designer Guo-qing Lin, started the exploration of various possibilities of flipping Chinese characters. Starting from Hello Taiwan, Chinese characters can be rotated, flipped, mirrored, etc., and the urban Chinese character series makes the city full of cultural stories and more imagination. Under Guo-qing Lin's ingenuity, "Flip Taiwan" was a creative practice which he continued to carry out through the redesign of Chinese characters. If it looks like "Taiwan" at first glance, it becomes "Hello Taiwan" if it is flipped 90 degrees; "Tainan" is flipped to become "castle town"; the harbor city "Kaohsiung" is turned into the character "dazzle" or "sing and dance," and so on.

With the theme of "Inheritance and Innovation", this seminar explored the influence of innovative design thinking on the continuation of traditions from diverse aspects such as humanities, society, and technology.

From 9 AM to 12 PM, there was a special speech by three distinguished guests and a comprehensive symposium for mutual exchanges. The presentations of the contributors of the papers were held from 1:30 PM to 5 PM. After the presentations, a dinner party was organized.Finally, domestic and foreign scholars and graduate students were welcomed to participate in this 2020 International Conference on Visual Communication Design &Basic Design Forum to exchange design experiences and related research results together!

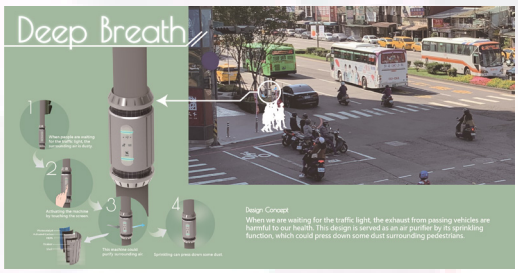
Awards and Commendation

YunTech Won Gold and Silver Medals at the Macao International Innovation and Invention Expo

Due to the impact of the Covid-19 pandemic, the competition of the 8th Macao International Innovation and Invention Expo 2020 was held online. The award ceremony was held at the conference hall of the Macao Science Center at 5 PM on October 27th. YunTech's research team won 2 gold and 1 silver medal.

2 Golds were awarded to

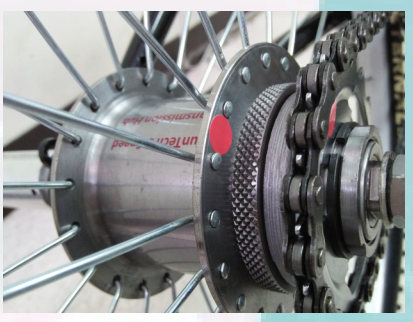
One of the awarded inventions was "Deep Breath," designed by Dr. Jui-Ch Tu (Research Team: Yi-Jing Sie, Hua-Jung Ko, Yen-Pei Liu, Dong-tai Xiao, and Shi-Chen Luo). This creation uses common active indoor air purifier technologies - HEPA filter and photocatalyst to suck dirty air into the machine, allowing the purification device to block or destroy particles in the air. Because the HEPA filter has a simple structure and can capture 0.3 micron suspended particles in the air, the advantage of the photocatalyst is that it has an efficient disinfection function and can turn pollutants into CO2 and H2O, but the purification of dust is limited. So, a very fine sprinkler was installed to bring the dust to the ground while the machine is purifying the air. For example, when you're crossing a road, exhaust fumes and smoke will affect your nose, but since the nose is a necessary passage way for air, those gasses can't be avoided. This device can purify the air and bring the dust to the ground.



Schematic diagram of Deep Breath

The other gold-awarded work was “High contrast and rapid switching speed dual-type electrochromic device based on poly(3,5-di(9H-carbazol-9-yl)benzonitrile) and poly(3,4-ethylenedioxythiophene)-poly(styrene sulfonic acid) complementary electrodes,” designed by Dr. Tzi-Yi Wu (Research Team: Zhong-wen Guo, Yu-Xuan Lai,Yu-Hsiang Chung, and Yi-ling Xu). Smart windows made using this technology have the following characteristics: good redox stability, high color contrast, rapid color change, and effective blocking of light and heat.

The only silver-awarded invention was “A Bicycle 5-Speed Internal Transmission Hub with an Integrated Magnetic Gear-Shifting Mechanism,” designed by Dr. Yi-Chang Wu (Research Team: Yu-Lung Chen, Si-Ying Gao, and Yi-Hung Chen). The five-speed transmission of this product uses a magnetic shift mechanism to shift gears. Compared with the mechanical shift mechanism on the market, it has a reliable speed regulation, low drag, no friction and wear, long life for the parts, and a simple structure. It also has the advantages of smooth gear shifting: when the bicycle is stopped, the gear shifting process is smooth and stable. The invention is also able to overcome blockade of the patent layout by international manufacturers. The product has been processed and tested through the prototype machine to verify the correctness of the gear movement and verify the high feasibility of technology transfer. The mentioned seamless five-speed transmission can be designed with different speed ratios, and is therefore suitable for the transmission of the following vehicles variable speed system: 1. General bicycles, mountain bikes, folding bicycles, electric bicycles, etc. 2. Manual wheelchairs, electric wheelchairs, etc. for the physically challenged. 3. Mobility aids for the elderly, such as light mobile vehicles and electric walkers.



5-Speed Internal Transmission on the rear wheel hub

Latest News

YunTech won the 2020 Taiwan Corporate Sustainability Award for Model University and Won Six Sustainability Awards as the Biggest Winner among all Taiwanese Universities

This year marked the second time that YunTech competed for the TCSA (Taiwan Corporate Sustainability Award). Compared to last year, the results were even more impressive. YunTech's comprehensive performance in sustainable development fully demonstrates the school's influence in governance, society, environment, and partnerships. It was favored by the jury for its excellent overall performance and won the "Taiwan Corporate Sustainability Award - Model University". YunTech was the biggest winner among universities of the 2020 TCSA (Taiwan Corporate Sustainability Awards). It was the only school that had won more than six awards. The specific awards were: Taiwan Corporate Sustainability Award - Model University, Corporate Sustainability Report Award-Gold Medal, English Report Award - Silver Medal (the only school to win), Social Inclusion Award (non-profit organization), University USR Sustainability Program Award - Bronze Medal (jointly constructing the Qianshan rural areas), University USR Sustainability Project Award - Bronze Medal (helping the Tsou Laiji tribe develop).

At the "13th TCSA Taiwan Corporate Sustainability Award, 2020", the number of participating companies reached 252, an increase of 28% from last year, which was a record high. This year, 29 universities and 14 hospitals participated in the award, and the cumulative number of companies reached 364. This year, as many as 668 people from the judging panel participated in the

selection. The evaluation process was objective, fair, just and transparent. Among the most influential and widely recognized index awards in Taiwan, 192 companies participated in this year's Chinese and English Report Awards. Among them, YunTech won the silver medal in the "English Report Award" and it was also the only school to win this award, which showed that YunTech was striding forward in its vision of internationalization and global partnership in addition to deep cultivation and sustainability.

YunTech President Neng-shu Yang received the Taiwan Corporate Sustainability Award - Model University on behalf of the school

In the USR sustainability program of the competition, YunTech participated in the two programs of "Utilizing the inherent cultural resources and Lishan spirit of the Tsou Laiji tribe" and "Cooperating to build the sustainable development ability of the Qianshan rural areas". Both programs won the bronze medal. It demonstrated that YunTech recognized the importance of the local place and demonstrated the influence of the university's social responsibility and the practice of sustainable development in the welfare of society and the green economy.

YunTech has always taken the use of education and R&D resources to solve local, industrial, community and global issues related to economics, society and environment as an important goal of running a school, and it has also actively pursued regional and global sustainability. In the Times Higher Education World University Rankings 2021, YunTech achieved outstanding performance in industry and academia, and performed well in the "Industry Income (Knowledge Transfer)" indicator, ranking 28th in the world. In addition to the aforementioned achievements, when the "2020 University Impact Rankings" was announced in April this year, YunTech was listed in the top 100 for SDG9 "Industry, Innovation and Infrastructure" and SDG6 "clean water and sanitation", ranking 79th and 80th respectively. YunTech also had outstanding performance on SDG8 "decent work and economic growth", SDG10 "reduced inequalities", SDG12 "responsible consumption and production" ranking 101-200 globally. Under the recognition of its double achievements, it showed that YunTech was a school that fully values sustainability and social responsibility.

What's more worth mentioning is that YunTech also won the Social Inclusion Award in this competition and is the only school (nonprofit organization) that won the award. YunTech has been helping with the development of two towns, Zhushan and Lugu, for many years. With the concept of cross-township regional design, YunTech developed the social integration of the local public brand of "Tea and Bamboo Township", and assisted local entrepreneurship and sustainability through the concept of supporting rural development with universities. Inventory of resources, local creation, sustainable talent cultivation, etc. have allowed the settlements to form a distinctive and sustainable circular ecosystem.

YunTech's Principal Neng-shu Yang stated that the school would continue to invest in education and R&D resources, and use the power of education and knowledge to promote economic, social and environmental sustainability. In the future, the school would become more focused on academics, industry-academia collaboration, internationality, intelligence, and other characteristics. hrough the development of the five modernizations and by linking all stakeholders in continuing to cultivate and move towards the vision of a world-class university of science and technology with "innovative teaching, connection, international linkage, deep cultivation and sustainability", faculty and students will expand the school's global influence in terms of the UN's 17 sustainable development goals (SDGs). Teachers and students will work together to promote social integration and fulfill the university's social responsibilities.

Latest News

Dr. James C. Liao, President of the Academia Sinica, Visited YunTech to Congratulate YunTech on its 30th Anniversary -

"Plastic-free, Responsible Consumption and Production" School Fair to Cherish our Earth and Celebrate the 30th Anniversary

YunTech held its 30th anniversary on November 28th, 2020 (Saturday). The school arranged a series of celebration-related activities, including the school celebration, tea party, carnival and creative market; and invited the founding chief supervisor to return to the school to celebrate YunTech's 30th birthday.With the theme of "Stand Majestically, YunTech Restoration" as the 30th anniversary celebration theme, and under the leadership of President Neng-shu Yang, the teachers and students of the school presented a model of industry and academia that exerts creative soft power and move towards an innovative top science and technology university.

Principal Cong-ming Lin and YunTech's founding veterans taking a group photo.

Under the leadership of previous presidents, YunTech has established a leading position in the field of technical occupations. Since President Neng-shu Yang took office, in addition to continuing YunTech's excellent academic tradition, the school has also taken the "pragmatic and practical science and technology university model" as its development vision and planned to develop four aspects: student performance, teacher development, university contribution, and international influence. After 30 years of hard work, YunTech has "constructed an appropriate educational environment for talent development", "constructed a mechanism for linking R&D results and new ventures", "used education and R&D resources to solve local, industrial, social, and global issues." , and applied the strategy of "Continuous School Affairs Innovation and Reform". Through the plan of using resources of the school and higher education deep ploughing, the existing system of colleges and departments will be closely integrated with "YunTech's PBL Research Center" and "Future College" to successfully achieve YunTech's new teaching and cultivation system, namely an efficient student learning environment as the focus, adaptability and talent development as the goal, education innovation as the strategy, and access to community and industry as the target.

On November 28th (Saturday), President Neng-shu Yang mentioned in his speech that although the school is located in Douliu, he has not dared to relax in the past 30 years. In order to show the bright achievements of YunTech, the school specially invited Jun-zhi Liao, Dean of Academia Sinica, to give a speech to share the challenges of Covid-19 and the response in the post-epidemic era. After the forum, the National Excellent Teacher Award Ceremony was held, and specially-appointed professors, excellent teachers and outstanding employees were awarded.

In addition, in recent years, our school's anniversary celebration fairs have adopted the theme of "Plastic-free, Responsible Consumption and Production" and promoted the theme of plastic reduction and environmental protection. The results have been remarkable. The event is going to continue this year. We called on all teachers and students to work together on environmental protection. In addition to promoting the consumption of self-prepared tableware, the plastic-free buying and selling movement is promoted in the creative market, hoping to achieve the goal of reducing the amount of garbage generated compared to the school fairs in previous years. This year's school fair booths are all-encompassing, including hand-made pottery, hand-made woodwork, collage cloth bags, hand-painted picture cards, hand-dyed T-shirts, and many other creative lifestyle products and other treasures waiting to be found.

The school also invited alumni, and the club carnival activities were even more colorful, showing various dances, music, dramas, and other programs. At the same time, the school fair also held fire escape rope rescue drills , assisted landing escape drills, a military simulation competition, and scientifically creative water rocket competition. From the joyous atmosphere of the 30th anniversary of YunTech, everyone witnessed the growth of YunTech.

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