



Newsletter of YunTech

National Yunlin University of Science & Technology

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The First in Taiwan! The College of Management of YunTech Opens a Smart Store and Self-service Store

The trend of new retailing was growing in 2017. The whole world was crazy about self-service stores, and the overturning change could be predicted. To comply with the trend, the College of Management of YunTech focused on three strategies, excellent teaching, practical learning, and a global vision. The college applied for a project to optimize the practical learning environment for technological and vocational colleges/universities by the Ministry of Education (MOE) in 2018 to establish an intelligent practical site at the Intelligent Business Center. The center employs 4 functions. They are Intelligent Retailing, Smart Logistics, Smart Fintech, and Smart Technology. It hopes to integrate resources from the industrial field, the government, academics, and research to create new models focusing on industry application, training program, and innovative

entrepreneur. By creating an intelligent business job market, YunTech can help guide the young generation in running a new retailing industry in a deep way. The goal of this project is to help students to find the future and also help the industry to find the talents they want in the end. In the process integrating every need the new retailing industry needs and cultivating skilled talents the industrial field needs, the competitive strength of technological and vocational education can be increased.

The functions of Intelligent Retailing and Smart Technology integrates the university book store through the retailing intelligent Cloud platform by Advantech and iCommand Center that enables one to collect instant store data, including passenger flow analysis, store hot spot analysis, indoor air quality monitoring and so forth. In the future, Point of Sale (POS) selling information will be integrated to assist the store in adjusting its management strategy. Furthermore, there are other equipment such as the Internet of Things (IoT) automatic vending machine selling agricultural products, IoT block automatic vending machine selling cultural

and creative products, IoT future gift vending machine, robotic arms, and so on. Yunlin County Magistrate Chang Li-shan spared her time visiting the center and took part in a program shooting of Dream Great School of China Television on January 9th, 2019. Besides promoting local agricultural products, Magistrate Chang also operated the machines to understand its future running modes.



The robotic arms

The site also connects with local industries. For example, Chunghwa Telecom cooperates with YunTech to link resources from Yunlin County Government, Nan Ren Hu Entertainment Co., Ltd., and local agricultural products company or cooperatives to establish a self-service store at the green tunnel station located in Gukeng to assist in promoting and selling local agricultural products. Other novel techniques are applied at the site, such as Intelligent IoT sensor interactive shelves, indoor micro-GPS app, interactive TV wall, and so forth to create a virtual and real customer experience area. In addition to the integration of AI and IoT applied to the self-service store, more intelligent equipment and techniques are needed to acquire more accurate data for the management quality and efficiency in running the future market. Therefore, several important techniques of intelligent retailing will be fully applied to the future market. Subsequently, the market can adopt advanced techniques in selling agricultural products, reducing the possibility of them being sold with cheap prices. These advanced techniques will undoubtedly become the trend of the future development. As for information safety relating to IoT, YunTech adopts WISE-STACK of Advantech which is a private cloud offering an on-premise deployment method. The private cloud can affirm the information safety from the root data to the cloud system.

Besides having a physical site for practice, the center cooperates with the industrial field to provide internship

opportunities. Alibaba Group Holding Limited, Family Mart, Taiwan Distribution Center Co., Ltd., and so forth are the companies offering internship opportunities to students to gain real experiences. The cooperation between the center and the enterprise can bring the resources of YunTech to the industrial field to achieve a win-win situation.



The explanation of facial recognition for entering the gate

The 2019 University Impact Rankings Shows that YunTech is Highly Recognized Internationally

Times Higher Education (THE) announced the 2019 University Impact Rankings. YunTech was ranked 101 to 200 on its overall score for university impact ranking. The rankings are evaluated based on the 11 of the 17 Sustainable Development Goals (SDGs) set by the United Nations General Assembly. YunTech was ranked 44 for SDG9: Industry, Innovation and Infrastructure and 48 for SDG12: Responsible Consumption and Production respectively.

It was the first time for THE to evaluate university impact in 2019. The evaluation of the ranking is based on 11 SDGs set by the United Nations General Assembly. The SDGs chosen includes 3 aspects, economic growth, social development and environment protection. There were 462 universities from 76 countries in the final rankings. Globally famous universities were in the final rankings. For example, they are the University of Manchester, University of British Columbia, Kyoto University, University of Tokyo, King's College London, University of Hong Kong and so forth. 12 universities from Taiwan were in the final rankings. Tzu Chi University, National Taiwan University and National Cheng Kung University were among the top 100. YunTech, National Changhua University of Education and Asia University are between 101 and 200. National

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Central University, National Tsing Hua University, National Taipei University, National Kaohsiung University, Chaoyang University of Technology and China Medical University are between 201 and 300. The overall ranking of YunTech is 4 among the other universities from Taiwan. It can be seen that YunTech focuses on sustainable development and its impact on society and the world.

Yuntech was ranked 44 for SDG9: Industry, Innovation and Infrastructure. The core of YunTech is to foster students in developing their ability in practice to meet the needs of their future careers. To support students in starting their new businesses, guidance service is provided. To encourage students to commercialize their innovation results, YunTech will provide funding for them to establish micro-cultivation rooms. To encourage both teaching faculties and students to start up their own businesses, YunTech has opened a new innovation division to consult teams grouped by teaching faculties and students who have the potential to innovate products. From 2009 to 2018, the division guided 35 teams to apply for and won a grant from the project of innovation and entrepreneurship of the Ministry of Science and Technology and U-start of the Ministry of Education. The total value of the grant is NT. 18.5 millions. There were 16 new companies until the year of 2017, which showed that the cultivation of students' entrepreneurial skills was a great success.



GOGOFurniture wins grant valued at NT. 1 million at UStart

Yuntech was ranked 48 for SDG12: Responsible Consumption and Production. YunTech works on cultivating both faculties and students to be responsible for their civic responsibilities. Based on the spirit of sustainable consumption, the amount of trash should be reduced, waste should be handled properly and use of disposable tableware should be decreased. Moreover, YunTech has guided students in forming environment protection clubs and becoming volunteers to assist

recycling. In 2017, YunTech won awards for energy saving and innovation by the Bureau of Energy, Ministry of Economic Affairs and won an excellent award by the Green University Union of Taiwan. In 2018, YunTech was ranked 102 by the UI GreenMetric World University Ranking.



Green Channels wins grant valued at NT. 600,000 for the project of innovation and startups

Based on the importance of sustainable development, YunTech stated that the university would enlarge its Research Center for Social Practice into a Research Center for Sustainable Development and Social Practice to widen the global impact of the university among the 17 SDGs.

YunTech is Ranked at the Top of Technological Universities at the Categories of Teaching, Industrial-academia Cooperation and Globalization in Accordance with the Openness of Information of Colleges in Taiwan, Ministry of Education

According to the openness of information of Colleges in Taiwan, Ministry of Education (MOE), YunTech which was ranked in the range of 101-200 by Times Higher Education (THE) was ranked the first at the category of enrollment stability, second at the category of industrial-academic cooperation and third at the category of globalization.



President of HAWtech of Germany is interacting with a PhD student of YunTech

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In the category of teaching and consulting, YunTech initiated courses of design thinking and problem solution which were promoted by Stanford University, the United States. When students group in interdisciplinary teams, they can learn to solve real problems and gain fun and ability during the learning by doing process. In the academic year of 2018, the freshman enrollment rate and suspending/withdrawing rates of day-division undergraduate students were among the top 5% of all universities in Taiwan. According to the rate of studying stability announced by the MOE, YunTech was the second among all universities and the first among all technological universities in Taiwan.

In the category of power in connecting the industrial field with teaching faculties, there are nearly 80% of the teaching faculties of YunTech who devote themselves to industrial-academic cooperation. Students can gain problem-solving opportunities through practical cooperation, thus increasing their career competitiveness. In accordance with the data announced by the MOE, the average annual funding in the academic year of 2017 of each teaching faculty working on industrial-academic cooperation was nearly NT. 1,000,000. The average funding was the sixth among all universities and second among all technological universities in Taiwan. The average funding reached a new level in the academic year of 2018, and the number was roughly NT. 1,500,000 per teaching faculty. Moreover, YunTech has been granted an award for excellent institution in industrial-academic cooperation by the Chinese Institute of Engineers for 12 years consecutively in 2018, was granted with an award for excellent organization on enterprise by the Small and Medium Enterprise Administration, Ministry of Education in 2018, and was granted funding valued at NT. 35,000,000 for its higher research elites cultivation laboratory. Furthermore, the design college of YunTech includes the most comprehensive professional departments among all the other universities in Taiwan. The college has had outstanding performance and won awards at international design competitions. It has been ranked near the 6th among other universities in Asia by the Red Dot Design Award.



Director General Susumu Maruno of RDMM Promotion Center, KRI, Japan is experiencing a research result from the Department of Safety Health and Environmental Engineering

In the category of globalization, scholarship is offered for undergraduate freshman students for 60 students with a maximum value of NT. 2,000,000 and YunTech raised the scholarship valued at NT. 80,000 to 130,000 per semester for students to have exchange study in Germany and Japan. The exchange students are encouraged to study or take internships. In 2019, YunTech won over funding from the MOE to establish a college of international intelligent robots. YunTech has already signed a 5-year contract with Osaka Institute of Technology, Japan, to provide overseas study program (There were only 6 schools who won the funding provided by the MOE, and YunTech was granted funding valued at NT. 35,000,000). According to the data announced by the MOE, the ratio of international students and the ratio of students having an exchange study of YunTech were the third among all the technological universities in Taiwan.

YunTech stated the university designed an efficient educational focus by integrating problems of the industrial field, students learning, and innovative research. The College of Future + YunTech Industrial Research Institute will transform YunTech into a new international technological university by 2025. Based on the goal of increasing students' job competitiveness, YunTech deepened the concept of globalization and provided more chances for students to gain practical experiences in the industrial field. International top research elites were employed to do research and teach at the school as well. It is believed that more students will gain benefits, and in the process they will connect to the world and increase their international mobility while studying at YunTech.

YunTech Grants Outstanding Teaching Faculties with High Prize

To encourage teaching faculties with research and development power to contribute themselves to academic research in every single field, President Yang Neng-shu raised funds to establish the grant to increase our academic research prestige in 2019. If any teaching faculty of YunTech is granted with any award and prize by famous a international or domestic organizations, YunTech will grant a prize with equal value as well. The winners of 2019 were Chair Professor Shu Chi-min who was granted with the Outstanding Research Award by the Ministry of Science and Technology (MOST) in year of 2018, Professor Wu Tzi-yi who was granted with Wu Ta-you Memorial Award and Associate Professor Wu Ting-ting who was granted with Wu Ta-you Memorial Award in the year of 2017. Wu Ta-you is called the "Father of Chinese Physics," and the grant is used to cultivate researchers and encourage more research elites to contribute to the academic research in the future. The three outstanding teaching faculties were granted NT.900,000 and NT.300,000.

Chair Professor Shu Chi-min is from the Department of Safety Health and Environmental Engineering and is invited and employed as a journal editor by several SSCI journals and employed as a committee member at several colleges. Chair Professor Shu has published more than 280 SSCI journal papers and won more than 20 awards at different events. For research expertise, Chair Professor Shu is well-known internationally and has abundant achievements on safety engineering, runaway reaction, fire and explosion, lithium-ion battery safety and so forth. He stated that he was honored to win the MOST Outstanding Research Award in the year of 2018 for the research topic on Thermal hazard analysis of substances under environments of thermal insulation, constant temperature, and temperature rise to construct thermodynamics parameters chemical reaction and pyrolysis and analysis of the intrinsic characteristics and potential hazards. The award is definitely viewed as the best recognition and encouragement which has urged him to work non-stop on research.



Professor Shu Chi-min is granted the prize worth NT.900,000

Professor Wu Tzi-yi from the Department of Chemical Engineering has been cultivating a research team working on new electrochromic materials. The electrochromic materials the team developed has a great oxidant-reduction cycle stability and optical memory which can be applied to green energy-saving smart windows of smart buildings. With the materials, curtains are not needed anymore. Users only have to click the switch to change glass colors and transmittance to block light and heat into their rooms.



Professor Wu Tzi-yi is granted the prize worth NT.300,000

Associate Professor Wu Ting-ting from the Graduate School of Technological and Vocational Education works on implementing information technology into English teaching. When students are learning English, digital books are used as a tool to provide instant personal guidance and assistance. The personalized learning environment is helpful for learners to internalize their thoughts and increase their ability of understanding English, thus making the learning process meaningful.



Associate Professor Wu Ting-ting is granted the prize worth NT.300,000

President Yang stated that the three winners of the grant were all recognized and encouraged by the MOST, and they could be models for all the teaching faculties of YunTech. The teaching faculties of YunTech do not only show outstanding performance in their different academic areas but also devote themselves to practical applications. It is hoped the rich research power of YunTech teaching faculties can contribute themselves to Yunlin County.



Awards and Commendation

National Yunlin University of Science and Technology Shines at the International Competition, Moscow International Salon of Invention and Innovation Technologies, Archimedes!

The 22nd Moscow International Salon of Invention and Innovation Technologies, Archimedes, took place from March 26th to 30th in the year of 2019 in Moscow, Russia. The event attracted more than 700 inventions from 27 countries. The 4 inventions from National Yunlin University of Science and Technology (YunTech) were granted 2 gold, 2 silver and 2 special medals.

The 2 gold-medaled inventions are listed below.

The first gold- medaled invention, Foot-fitting, was granted a special medal at the Macao International Innovation & Invention Expo. The invention was invented by the research team which included students Shia Ji-ju, Hsieh Hsin-ting, Hsieh Jie-yu and Wu Jun-ting and which was under the instruction of Professor Fu Jia-chig and Associate Professor Lu Hsueh-yi from the Department of Industrial Engineering and Management. Foot-fitting is a system that could be applied to shoe selection on an e-commerce platform. When customers are choosing shoes, they simply need to take several photos of their feet and upload them to the system. Their foot size will then be analyzed and calculated with foot parameters through an image processing technique, and the most suitable shoe size for the customers will be recommended by the system. The invention helps users buy suitable shoes, thus reducing the possibility of buying shoes with wrong sizes, the time of refunding and the waste of money.

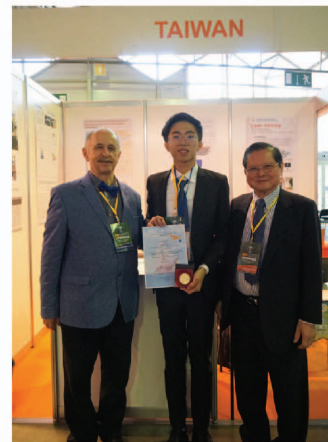


Photo of gold medal winner Hsia Ju-ju from the Department of Industrial Engineering and Management, the judge and Counselor Wu

The second gold- medaled invention, Multiple-Beam Interferometric Displacement Measurement System, was granted a special medal. It was invented by the research team that included students Shu Li-hong, Chang Zong-ping, Zhen Shi-hong, Kao Ming-yuan and Chang Hsuan-chen who were instructed by Professor Wang Yung-cheng from the Department of Mechanical Engineering. The resolution of the system reached the level of the nanometer, and the system is a common-path measurement system as well. The advantages of the system are its high measurement scale, anti-environment interference ability, the tilt angle of the mirror and so forth. It is believed that the system can be applied by the precision machinery industry.

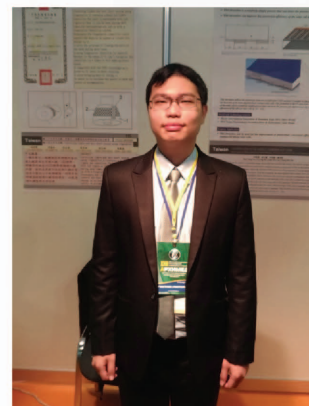


Photo of gold medal winner Gao Ming-yuan from the Department of Mechanical Engineering

The 2 silver- medaled inventions are listed below.

The first silver- medaled invention, Improvement on Photovoltaic Conversion Efficiency of Silicon-based Solar Cells with Aluminum-Induced Crystallization, was invented by students Hsu Li-lung, Lin Guan-wei and

Hsieh Cheng-che under the instruction of Professor Lin Jian-yang from the Department of Electronic Engineering. The invention holds the following advantages: 1. A p-n junction can be created by inducing P-channel poly-si growth with aluminum at low temperature; 2. The photovoltaic conversion efficiency of the solar cells can be increased from 10 to 15%. 3; and Manufacturing cost can be decreased and the yield rate consequently improved.

The second silver-medaled invention, Copolymer Consisting of 10-(4-(4-(9H-Carbazol-9-yl)phenylsulfonyl)phenyl)-9,10-dihydro-9,9-dimethylacridine and 3-methylthiophene and its Application on Satisfactory Long-term Switching Stability and High Optical Contrast Smart Window, was created by the team grouped by students Kuo Chong-wen, Liu Che-kai, Fan Shu-chien, Liu Zang-chuan and Chou Kai-jie under the instruction of Professor Wu Tzi-yi from the Department of Chemical Engineering. Electrochromic materials are widely applied to smart windows. When using this technique for building materials, ultraviolet can be blocked and the loss of light will be decreased. It is a novel technique for saving energy for future green buildings. Also, this electrochromic unit can switch more than 3 colors instantaneously. With only little energy, the unit can switch several colors and the transition of colors is reversible.



Silver- medaled invention Copolymer Consisting of 10-(4-(4-(9H-Carbazol-9-yl)phenylsulfonyl)phenyl)-9,10-dihydro-9,9-dimethylacridine and 3-methylthiophene and its Application on Satisfactory Long-term Switching Stability and High Optical Contrast Smart Window from Professor Wu Tzi-yi of the Department of Chemical Engineering

YunTech does not only devote itself to academics and research but also holds the vision of "Integration of industry and academics, and innovative design" to establish a novel R&D environment, thus promoting talents cultivation and adding intellectual property value.

YunTech Makes a Success at the International Exhibition of Inventions Geneva

The research team of YunTech participated in the 47th International Exhibition of Inventions Geneva, which took place in Palexpo, Geneva, and accomplished a huge success. They won 1 gold, 2 silver, 1 copper, and 1 special award in 2019.

The gold-awarded product Solar Heat Conversion Air Conditioner was invented by the team grouped by students Tseng Bo-ren, Shen Li-ching, and Tseng Bo-yen under the instruction of Professor Kuo Chao-yin from the Department of Safety Health and Environmental Engineering. The invention was also granted a special award. The invention can not only be applied to buildings which provide heat and cold air simultaneously, but the construction industry and green energy industry can also adopt this potential technology. It can be seen that there is a high feasibility with regard to technology transfer. As for the possible benefits, the invention focuses on providing solutions for environmental protection and energy saving. It is an invention which can decrease energy consumption, lower energy costs, and increase the efficiency of space cooling. The problem of peak loading in the hot summer will be solved based on the fact that on-electricity-driven and non-polluted air conditioning is adopted by this invention.

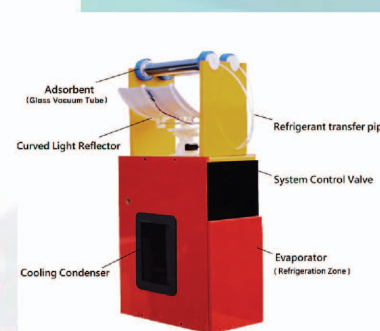


Photo of gold-awarded invention Solar Heat Conversion Air Conditioner

The 2 silver-awarded products are listed as follows:

The first silver-awarded product, Simultaneous Measurements of Tilt Angle and Linear Displacement in Fabry-Perot Interferometer by a Single Light Source,

was invented by students Hsu Li-hong, Chang Zong-ping, Zeng Guon-kai, Lin Chia-you and Shi Hong-da under the instruction of Professor Wang Yung-cheng from the Department of Mechanical Engineering. The precision positioning measurement system used mostly by the industrial field is the Michelson interferometer, which is a double light beam system. However, the measurement light and fixed light are easy to be interfered with by the environment under different environmental conditions. The measurement quality will thus be affected. Therefore, the invention adopts the Fabry perot interferometer which is a multiple light beams interferometer. The resonant cavity of the interferometer is constructed by 2 parallel mirrors. Interference beam is produced through precise lights overlapping, so that a strict degree is applied to the parallel mirrors. If the interferometer cannot be adjusted, the precision of measurement will be restricted by the tilt angle. In this way, the invention was invented to improve the tilt angle created during linear displacing. The displacement measurement can be performed under the condition of parallel linear movement, so that with a single light source a high precision displacement measurement can be realized.

The second silver-awarded invention, Emission Performance Improvement of Organic Light-Emitting Diodes with Multi-doped Emission Layer, was produced by students Hsu Li-long, Lin Guan-wei and Hsieh Cheng-che under the instruction of Professor Lin Jian-yang from the Department of Electronic engineering. The invention adopted a multi-doped method to create an organic light-emitting layer which has a better quantum effect. The luminous efficiency of the flexible light-emitting diodes can then be increased to more than 200%, which can satisfy the need for both green lighting and a flat-panel display.

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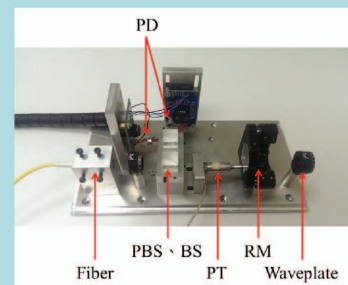


Photo of the first silver-awarded invention Simultaneous Measurements of Tilt Angle and Linear Displacement in Fabry-Perot Interferometer by a Single Light Source

The copper-awarded invention, The Disposal Assembly Blade of Laryngoscope with Adjustable Illumination, was invented by the team grouped by Professor Tseng Shi-chang from the Department of Mechanical Engineering, Dr. Lin Chi-mao from the Yunlin branch of National Taiwan University Hospital, and students Lin Yao Zong and Liao Yi-ting led by Assistant Professor Huang Chien-sheng from the Department of Electronic Engineering. The invention used both an illuminous optics design and computer-assisted analysis with double plastic injection to keep the original weight. Also, the disposable plastic laryngoscope blade meets the requirements of non-deformability and light tightness by International Medicine to reduce infectious risks.

The research teams of YunTech have been working on inventions which both meet the needs of the industrial field and improve the life convenience of the public in recent years. It can be seen the potential for the market is great. They have also actively improved and develop every possible forward-looking research technique.

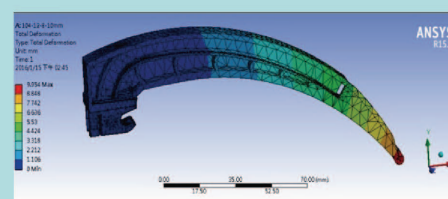


Photo of the second silver-awarded invention Emission Performance Improvement of Organic Light-Emitting Diodes with Multi-doped Emission Layer