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HIGHLIGHTS

Learning via Online Game

NTU Startups Win Silicon Valley Recognition

Experimental Farm Revamped

Campus Entrepreneurs Move from IP to IPO

Special Report

Local U Alliance





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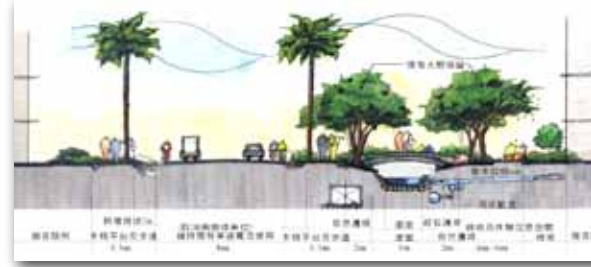
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NTU at a Glance

History Gallery Houses Skeleton of "Fantastic Sea Creature"





Vice President of Financial Affairs

SHU-HSING LI

Through his promotion of altruism, NTU President Pan-Chyr Yang encourages students and faculty members to apply their academic and research accomplishments towards solving society's problems. President Yang aims to build not just an elite university strong in academic and research capabilities, but a truly comprehensive institution capable of greatness.

As we strive to achieve this goal, NTU plans to implement the following projects:

Support disadvantaged students

For students from remote communities, which face limited access to foreign language resources, English listening comprehension scores are no longer calculated on entrance exams. Also, students demonstrating financial difficulties are provided free room and board as well as exemptions from miscellaneous fees.

Separate financial assistance from academic performance

President Yang has established special grants that eliminate minimum academic requirements for students demonstrating financial difficulties. Their period of eligibility for financial aid has also been extended from one year to four years. With this incentive, the university will also gradually boost the number of students eligible for academic scholarships.

Develop talent through interdisciplinary studies

NTU Garage and the NTU Entrepreneur Association helped the student startup team Flux, whose 3D printer is already receiving preorders, travel to Silicon Valley to take part in an entrepreneurship seminar last year. In the future, more startup teams are expected to be sent abroad to receive similar training. Meanwhile, the university has teamed up with a local business to establish the Diamond Seed Fund in offering student entrepreneurs up to NT\$500,000 in startup funds. The funds are presented absent any preconditions, whereby the university hopes only that the teams remember to demonstrate their gratitude to their alma mater after they meet with success.

Bringing innovative thinking to practical applications

A new institute of design, NTU's D. School is opening on the Shuiyuan Campus this September. Providing a solution-oriented education, the new institute of design will offer alternatives to traditional courses while providing training in multiple disciplines. Hailed as an entrepreneur's paradise that integrates the full range of the campus' entrepreneurial resources, the school will provide an entirely new learning experience that will promote autonomous learning and lifelong learning abilities.

Cultivating future leaders

Taiwan currently faces a severe fracture in leadership, and NTU bears the unshirkable responsibility to address this problem. We are planning the conversion of the old Hsuehou campus into a school focused on educating future leaders. The new school will recruit outstanding students from various disciplines and provide broadly focused courses that develop students' professional knowledge and skills.

Building a sustainable campus

The plan to renovate the Liugong Canal and the Luna Pond are part of NTU's mission to create a sustainable environment. Other projects, such as the reorganization of the Gallery of NTU History, also exemplify NTU's efforts to create a memorable campus that the Taida community can proudly call home.

HISTORIC NTU TRIANGLE ALLIANCE LINKS NTU, NTNU, AND NTUST CAMPUSES

NTU joined in an historic partnership with its neighbors National Taiwan Normal University and National Taiwan University of Science and Technology with the establishment of the NTU Triangle Alliance in January. Taking advantage of the close proximity of these three elite Taipei City universities, as well as the complementary nature of their academic and research programs, the new alliance facilitates a broad range of inter-campus cooperation among the three institutions. The alliance also permits the students to enroll in for-credit courses at the other two universities.

By introducing a new model for substantive collaboration, the formation of the NTU Triangle Alliance marks the turning of a new page in the history of higher education in Taiwan. Already, the partnership has enabled the three universities' nearly 60,000 students and faculty members to enjoy inter-campus access to wireless Internet, library resources and computer facilities, receive special store and restaurant discounts, and commute quickly between the three campuses on direct shuttle buses.

NTU, NTNU, and NTUST have each developed distinctive areas of academic specialization, and their strengths and resources complement each other well. While NTU boasts the best overall performance across a range of fields, NTNU is renowned for its excellence in education as well as music, the arts and humanities, and athletics. Meanwhile, NTUST stands as a high technology leader in Taiwan, educating outstanding professionals for the technology industry. The NTU Triangle Alliance integrates the abundant resources of these institutions, creating a more optimal educational and research environment, and allowing students to pursue their learning interests across campuses and disciplines.

The members of the NTU Triangle Alliance are located within close proximity of each other in the Daan and Wenshan Districts

of Taipei City. This makes the sharing of resources among the campuses easy and convenient. Beginning in the 2014 academic year, students of the three universities are permitted for the first time to enroll in courses on any of the three campuses, with their own university recognizing the credits earned. During the first semester, 572 students took advantage of this opportunity, 223 from NTNU, accounting for the greatest portion at 39%, and 183 from NTUST and 166 from NTU, or 32% and 29%, respectively.

During the course registration period for the second semester, the universities jointly launched an online course selection system that allows students to sign up for classes on any of the three campuses with just the click of a finger. Another major area of integration will come with the coordination of academic calendars at the start of the 2015 academic year. Such synchronization of major dates, including the dates for the beginning and end of the semester and for



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adding or withdrawing from classes, will enable students to take full advantage of the expanded range of courses offered across the three campuses.

These actions of eliminating the institutional barriers that have separated the neighboring campuses have opened the door for greater utilization of the three universities' resources to their combined student bodies and faculties. The integration of library resources, for instance, entails issuing inter-library passes to all full-time faculty and graduate students, as well as the exchange of 100 library cards between each university to be reserved for undergraduate students.

In addition, the universities will also share academic resources and cooperate in organizing joint events and activities aimed to promote exchanges among their three administrative systems. The events will include academic forums, adult education

exhibitions, professional skills seminars, and volunteer community service projects. They will be open to the faculty and students of all three schools.

The NTU Triangle Alliance is turning Taipei City into a real university town in so many ways. By working with local businesses, it provides students with special store and restaurant discounts; 103 businesses have signed on so far. Meanwhile, shuttle busses now run daily among the three campuses, linking the schools via quick and convenient commutes. The students, faculties, and administrative personnel of the alliance universities also enjoy parking discounts on all three campuses.



NTU ENTREPRENEURS WORK AND PLAY TO MAKE 2014 A YEAR OF CREATIVITY AND INNOVATION

Taking a look back at the year gone by, 2014 certainly stood out as a year of creativity and innovation here at NTU. Since the launch of the Creativity and Entrepreneurship Program, Entrepreneurship Association, and NTU Garage, NTU has seen a number of student teams grow and flourish into remarkable startups. The school's achievements have been recognized not just in Taiwan, but around the world, as well. NTU startup teams FLUX (a 3D Printer) and Somer (a mobile application) travelled to Silicon Valley in the United States for entrepreneurship training. Three NTU teams also stood out among hundreds to finish within the top five places and win Outstanding Entrepreneurship Awards in a national competition organized by the Ministry of Science and Technology.

During the university's year-end review press conference, NTU President Pan-Chyr Yang pointed out that NTU has spared no effort in recent years in its drive to encourage innovation and entrepreneurship among both the teaching faculty and student body. Not only has NTU become a university strong in research capabilities, it has also grown into a center for nurturing creativity and innovation. As a result of such efforts, many of NTU's startup products have been recognized for their market potential both here in Taiwan and overseas.

Meanwhile, Executive Vice President for Academics and Research Liang-Gee Chen reiterated that NTU will continue to encourage startup projects in the upcoming academic year, as well as work to enable more student teams to follow in the footsteps of such teams as FLUX and Somer and participate in entrepreneurship training programs in



the United States. FLUX became the first NTU team to travel to Silicon Valley in 2014, while Somer departed for that home of startups in January of this year.

The establishment of the NTU Garage project has also provided a common workspace for NTU innovators. Since its establishment, the project has encouraged its participants to enter various competitions, so they can acquire deeper understandings of their strengths and weaknesses and how their creations size up against the multitude of innovative ideas popping up around the globe. As a result, NTU succeeded in taking home three of the five Outstanding



▲ The mobile games designed by Gauss Toys integrate physical and educational training.



▲ Participants take part in the event's press conference.

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▲ (left) The PaGamO team is all smiles over their online gaming platform. (right) The Somer team took its mobile application to Silicon Valley in January.

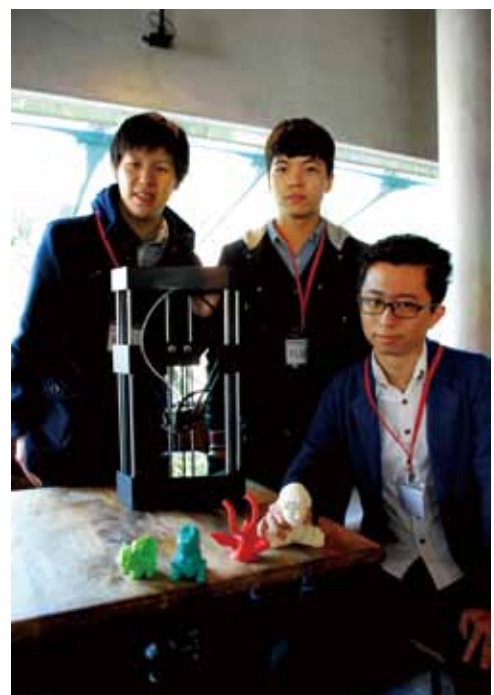
Entrepreneurship Awards presented in the MOST Innovation and Startups competition in 2014.

In addition to FLUX and Somer, EpiFaith and GausToys were also among the NTU teams to shine in 2014. The EpiFaith team created a safer syringe that can be produced at a lower cost. The team has already registered for patents in many countries and the product is scheduled for production in two years.

By combining mobile games with physical and educational training, GausToys became another example of research turned innovation. The team is now seeking to expand their application to help patients undergoing medical rehabilitation.

Winning multiple prizes last year, PaGamo excelled as one of NTU's most outstanding products in 2014. Designed under the leadership of Prof. Ping-Cheng Benson Yeh of the Department of Electrical Engineering, PaGamO is a multi-player online learning game created for his "Probability" course. The team officially registered as a startup company in March, 2014, and has since recruited up to 15,000 users worldwide. The PaGamO team also won the highest honors at the first QS/Wharton Reimagine Education Awards in December.

At the year-end press conference, President Yang further pointed out that students in Taiwan are filled with the spirit to pursue research and develop innovative ideas. In 2015, NTU will continue to provide more resources to help these students turn their ideas into executable plans and marketable products. He also expressed gratitude to the teams of student and faculty entrepreneurs for their tireless efforts, and said he looked forward to more outstanding innovations to emerge in 2015.



▲ Members of the startup team FLUX show off their 3D Printer.



ONLINE LEARNING GAME WINS TOP GLOBAL EDUCATION INNOVATION COMPETITION

Though he had clearly come to the awards ceremony invitation in hand, Prof. Ping-Cheng Benson Yeh flushed with shock as he found himself ascending the stage at the Wharton-QS Stars Awards last December. Yet, the ponytailed professor's disbelief soon turned to delight as he began to register the reassuring sound of congratulatory applause.

As it turned out, Yeh had indeed been called to the stage to accept the global education innovation competition's top award. Not only had his popular online learning game, PaGamO, touted as "the world's first-ever multi-student social game," been named co-winner of the competition's E-Learning Award, it had come away as co-winner of the Overall Award as well.

Prof. Yeh's surprise had been well warranted. Held on December 9 in Philadelphia, U.S.A., the competition, called Reimagine Education, was organized by Quacquarelli Symonds, publisher of the QS World University Rankings, together with The Wharton School SEI Center of the University of Pennsylvania. As the first major international competition for the promotion of innovative approaches to higher education, the event drew stiff competition, which included some of the world's most prestigious universities and enterprises, among them Harvard. In all, 427 teams from 43 countries competed.

PaGamO challenges students to solve problems based on their coursework as they compete in a virtual world to acquire land

holdings and wealth. A combination of various gaming models, PaGamO allows players to spend what they have earned to defend their land against the attacks of monsters and other students. Prof. Yeh, who serves as associate director of NTU's Center for Teaching and Learning Development, developed the game's platform together with students of the Department of Electrical Engineering, Department of Computer Science and Information Engineering, and his BoniO innovation team. Though first designed for Prof. Yeh's massive open online course on probability, the platform enables instructors to insert questions regarding any subject.

Following the ceremony, Prof. Yeh gave an interview to the international media. An IBM research manager also approached Prof. Yeh to express congratulations and the desire to hold further discussions, while a representative of Europe's EdTech Conference invited him to speak in London.

The iGEMTaiDa team's Skin Guardian treats oily skin, while Biomod's NanoJellyFish delivers drugs to targeted viruses.

For more information about the iGEMTaiDa team, please visit http://2014.igem.org/Team:NTU_Taida/TEAM.

Two NTU undergraduate teams designed innovative biological systems that earned them some of the top innovation awards in Boston, U.S.A., last November. With its Skin Guardian, a genetically-modified e. coli bacteria that promises to whiten and add fragrance to the skin, team TaiDa grabbed a Gold Medal at the 2014 International Genetically Engineered Machine (iGEM) competition. Meanwhile, team NTU claimed a Silver Medal, a Best Presentation Award, and an Audience Choice Award with NanoJellyFish, a versatile nano-robot that targets different viruses to ward off disease, at the 2014 biomolecular design competition for students, BioMOD.

The iGEM competition is a global synthetic biology competition that invites student teams to design and engineer simple biological systems from standardized, interchangeable parts and operate them within the cells of living bacteria. In the competition, teams are presented with a supply of different lego-like biological parts, called BioBricks, from the Registry of Standard Biological Parts. These building blocks include such genetic components as promoters, terminators, reporter elements, and plasmid backbones. The students assemble the parts while combining them with new parts of their own creation into biological mechanisms, and operate them in living cells.

The nearly two-dozen students of iGEM-TaiDa came from a range of departments and were supported by the university and local enterprises over their ten-month effort to develop their Skin Guardian. Designed as a skin-care product, this novel genetic circuit metabolizes the fatty acids of the oil and

Gene Machines Engineered from Biological Parts Earn International Awards

sebum secreted by the skin in order to whiten the skin, soften wrinkles, while creating a rose-like smell.

Meanwhile, the BioMOD-NTU team's NanoJellyFish was constructed using two pairs of genetic structures, each a domed hemisphere wielding two tentacles to simulate the shape of a real jellyfish. The team used DNA origami technology to construct the jellyfish out of DNA staples and scaffolds. Serving as a means of drug delivery, the jellyfish joins together to capture a targeted virus and releases a protein to neutralize the pathogen.

Both teams were enrolled in the course "Biochemical Technology Project Design and Implementation," co-taught by Prof. Yen-Rong Chen of the Department of Biochemical Science and Technology and Prof. Hong-Ren Jiang of the Institute of Applied Mechanics.



SAFER EPIDURAL SYRINGE WINS TEAM NATIONAL ENTREPRENEURSHIP COMPETITION



was held as part of the MOST program called From IP (Intellectual Property) to IPO (Initial Public Offering) (or, FITI), which aims to help researchers turn their creative achievements and innovative ideas into successful products and startup companies.

The college's EpiFaith team underwent three stages of intense competition over six months to stand out from the pool of more than 300 teams, and was ultimately able to claim the competition's Outstanding Entrepreneurship Award. Besides winning the most prestigious prize, the EpiFaith team, led by Prof. Tzu-Ming Liu of the Institute of Biomedical Engineering, took home a cash award of NT\$2 million that will go to support its new enterprise.



The EpiFaith syringe employs a compact, mechanical design that addresses existing clinical issues associated with epidural injections. At present, doctors rely solely on their sense of touch and experience when carrying out the procedure. EpiFaith addresses this limitation by providing assisted control that helps doctors hit their targets and avoid damaging nerve tissue.

At its core is a body that detects changes in pressure mechanically and locks the needle automatically into position once it reaches its target. This function reduces the risks of performing the procedure by giving doctors greater control and precision. Moreover, compared to other technologies for detecting needle positions, the team's syringe is less expensive and conforms more closely to the methods doctors are already using to make injections. Though fully mechanical, the EpiFaith syringe is also disposable.

The syringe's many advantages as well as low costs create a very low barrier to its adoption by the medical community. Prof. Liu and his entrepreneurial partners have set their sights on meeting the needs of doctors who perform epidural injections. The team sees their EpiFaith syringe as the optimal solution for performing such procedures as epidural analgesia during childbirth and epidural steroid injections.

A team at the College of Medicine won the top award in a national entrepreneurship competition organized by the Ministry of Science and Technology for its development of a new syringe for epidural injections that is not only safer but costs significantly less to produce than the syringe doctors currently use to perform the risky procedure. The competition



UNIVERSITY OF ALBANY PRESIDENT VISITS TO SIGN AGREEMENTS

NTU welcomed to its campus a delegation of high-level officials from its partner university, the University of Albany, State University of New York, on December 15. Headed by UA President Robert J. Jones, the delegation had traveled to Taiwan to pursue a deepening of the already substantial cooperative relationship enjoyed between the two universities in face-to-face meetings with the NTU administration.

Besides discussing a range of possible areas for further cooperation, officials of the two universities signed two important agreements, one expanding the student exchange program, and another establishing a dual diploma program in atmospheric science between NTU's Department of Atmospheric Science and Albany's Department of Atmospheric and Environmental Sciences.

President Jones was accompanied by five other UA representatives, Vice President for University Development Fardin Sanai, Vice Provost for International Education Ray Bromley, Director of the Atmospheric Sciences Research Center Everette Joseph, Senior Research Associate Qilong Min, and Associate Professor Anthony DeBlasi. President Jones led the delegation in holding in-depth talks with NTU President Pan-Chyr Yang, representatives of the Office of International Affairs, as well as faculty members of the Department of Atmospheric Science. The discussions served to facilitate exchanges between the two universities' scholars and pave the way for future collaboration in such fields as atmospheric science and East Asian studies.

The prestigious New York state university stands out among the small number of universities in the United States that recognize Taiwan's General English Proficiency Test (GEPT) scores when students apply for exchange programs at UA. Moreover, the signing of the dual diploma program during the delegation's visit will allow students of NTU's Department of Atmospheric Science to earn two bachelor's degrees following the completion of two years of studies at each school.

NTU and UA share an increasingly fruitful relationship. Since establishing their partnership in 2005, more than 60 students have participated in exchange programs between the two institutions. The latest talks are expected to facilitate further cooperation and exchanges.

我為什麼要去台灣?

臺灣人的文化
友
方人的想法



▼ Exchange student Luis Fernando Cordazzo Vargas shares his impressions of life and learning at NTU.

Education Fair Promotes Scholarships for International Students

NTU is Taiwan's flagship university. Recognized as a leading higher education institution in Asia, the university offers rigorous training across a comprehensive range of academic disciplines. It has also educated numerous influential leaders and scholars since its establishment in 1928. To meet the needs of international students interested in studying at NTU, the Office of International Affairs held an Education Fair here on the NTU campus on December 21.

The event included the education fair as well as two information sessions: one in English (a morning session) and one in Mandarin Chinese (an afternoon session). Representatives from each of NTU's colleges were on hand to provide information and answer questions about applications and requirements. Students were advised to schedule consultations online prior to the fair. The information sessions provided brief introductions to NTU, information on both degree and non-degree programs, and presentations by current students sharing their learning and life experiences at NTU.

To attract the most exceptional international students to Taiwan to develop their academic potential, NTU has recently launched a generous scholarship scheme. Starting this year, NTU will provide a three-year PhD scholarship valued at up to NT\$1.5 million (US\$ 48,000) per person.



▲ Parents and students enthusiastically ask questions during the Education Fair for International Students.

Besides the PhD scholarships, the university is also offering scholarships for Master's (half a million New Taiwan Dollars) and Bachelor's degree students (with tuition waiver). The education fair provided an opportunity for the OIA to directly explain the details of the scholarship programs to interested students. The information was made available on the Office of International Affairs website, as well.

NTU cultivates students' international competitiveness and provides world-class academic training in a wide variety of fields. The beautiful campus and internationally recognized teaching faculty are here to encourage international students' academic development, and our newly launched scholarship program supports international students in pursuing their academic and career goals.



▲ (left) Opening last November, Dao Xiang Guan is a retail store for the Experimental Farm's products. (right) People come to the NTU campus to play and relax at the Experimental Farm to Silicon Valley in January.

Restoration Gives New Life to Historic Building on Experimental Farm

Taiwan has experienced a wave of idle land and buildings being revitalized for new uses in recent years. From the university's renovation of an old dormitory into a coffee shop on Xinsheng South Road, to the conversion of the old NTU Library building into the Gallery of NTU History, NTU has been an active participant of this trend as it continues to energize and beautify its historic campus.

In this ongoing effort, the university gave new life to another neglected building last year when it carried out the restoration of a Japanese-era wooden bungalow that was originally a tool warehouse on the NTU campus' Experimental Farm. Opening in November, Dao Xiang Guan is now a venue for exhibitions and activities as well as a retail store for the farm's products. It joins the Eikichi Iso Memorial House, a former workshop of the father of Taiwanese Penglai Rice, in exhibiting the developmental history of agriculture in Taiwan.

Chun-Chian Liang, a technician at the Experimental Farm's Horticulture Section, stresses the buildings' historical value, declaring, "Dao Xiang Guan and the Eikichi Iso Memorial House are the predecessors of the College of Bioresources and Agriculture.

It would be a real shame if they were not preserved." Now, the old structure includes an exhibition space and garden area that bring together history and ecology. In addition to offering a place for people to come for recreation and relaxation, the restored buildings also promote environmental education.

At the same time, Dao Xiang Guan serves as a store offering an enticing array of products grown and made on the Experimental Farm, including fresh vegetables, flower and fruit teas, essential oils, and hand-made soap.

Although the farm is located on the NTU campus, it is an independent organization that does not receive full funding from the university and must depend on government projects as well as donations from private individuals and organizations to stay in operation. Income from the store helps the farm to continue its mission to promote history and ecology as well as recreation and education.

In preparation for the upcoming NTU Azalea Festival in March, Dao Xiang Guan is organizing fun and educational activities that will be open to members of the Taida family as well as the public.

ASTROPHYSICISTS CELEBRATE ANTARCTIC BALLOON LAUNCH OF NEUTRINO ANTENNA



Scientists at the Graduate Institute of Astrophysics and Leung Center for Cosmology and Particle Astrophysics (LeCosPA) celebrated the launch of a high-altitude balloon consisting of a neutrino-detecting antenna array from the ice plains of Antarctica on December 18. However, perhaps the most elated among them was Distinguished Junior Fellow Tsung-Che Liu, who had journeyed to Antarctica to participate personally in the assembly and launch of the antenna array.

The NTU researchers are members of a major international astrophysics team that released the Antarctic Impulsive Transient Antenna, ANITA, high into the polar sky. The ANITA team hopes to detect neutrinos coming from deep space in order to unravel mysteries regarding the physical nature of the farthest reaches of the universe. NTU also played a major role during the previous two ANITA experiments, which were launched during the Antarctic summers of 2006-2007 and 2008-2009.

Scientists expect to advance their understanding of the universe's evolution by solving the perplexing mystery of the origin of ultra-high energy cosmic rays. Researchers and theorists have set their sights on neutrinos as the best candidate for answering their questions regarding the source of cosmic rays. This is because when ultra-high energy cosmic rays collide with the cosmic microwave background, they produce Greisen-Zatsepin-Kuzmin neutrinos. Scientists believe that if they can determine the direction of these GZK neutrinos, they can then clearly designate from where in the universe these high energy cosmic rays originate.

The ANITA scientists have chosen to use the expansive ice plains of Antarctica as a giant neutrino-detection target. When GZK neutrinos reach Antarctica, they interact with the ice sheet to release a massive volume of positive and negative electrons, generating Cherenkov radiation. If ANITA happens to capture readings of the radio frequencies emitted by the Cherenkov radiation, investigators will be able to confirm their existence and even point to the location of their origin.

At the heart of the ANITA project is a cylindrical array of 48 highly-sensitive antennae. The antenna array is suspended from an enormous high-altitude balloon and launched to an altitude of approximately 35 kilometers up in the atmosphere. From this soaring vantage point, ANITA takes in the radio frequency signals coming from the Antarctica ice.

Research Achievements



Intel Asia Innovation Summit Shared at Intel Innovation Summit in Taipei

The Intel Asia Innovation Summit was held in Taipei for the first time on November 18-19. The occasion provided the perfect opportunity for the world-class researchers at the Intel-NTU Connected Context Computing Center to show off the innovative technological applications they have been developing for the coming world of the Internet of Things (IoT). The center's research accomplishments are the fruits of close cooperation between the Ministry of Science and Technology, NTU, and Intel Corporation over the last four years.

IoT and machine-to-machine (M2M) sensing and computing technologies are becoming increasingly mature and the research currently underway is already beginning to be developed into applications that impact people's lives. Below are a few of the wonderful technologies NTU researchers shared with the world during the two-day conference:

Intelligent transportation system

Prof. Yi-Ping Hung of the Department of Computer Science and Information and his fellow researchers are working on an intelligent transportation system developed around a context-based micro-navigation system that obtains real-time IoT information. With its M2M awareness of road conditions, other vehicles, and even the aggressiveness of other drivers, the system provides driving instructions that help drivers avoid accidents and reach their destinations with greater speed and fuel efficiency by allowing them to circumvent traffic jams.

Distributed video sensors

Researchers led by Prof. Shao-Yi Chien of the Department of Electrical Engineering are developing distributed video compression and analysis technologies that can effectively handle the enormous

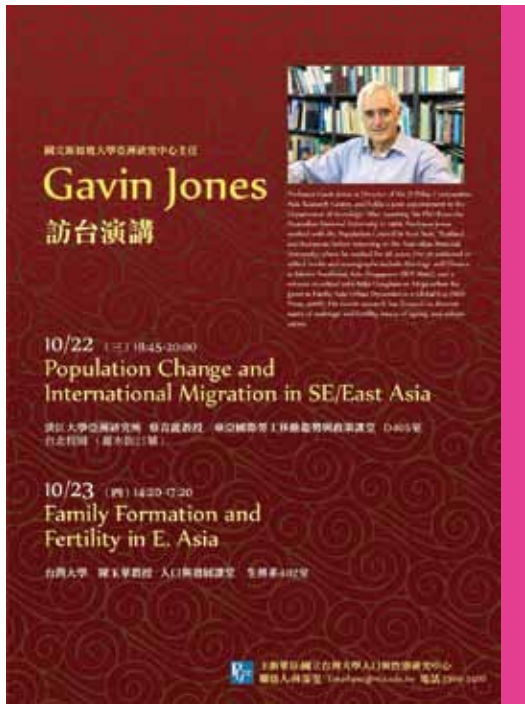
amount of video data captured by digital cameras. The technology aims to distribute all of the required computing among a massive array of cameras, base stations, and cloud servers, while at the same time filtering out unimportant and redundant video data during the distribution process. The technology is expected to greatly decrease the volume and time needed for data transmissions.

Energy harvesting device

Led by Prof. Wen-Jong Wu of the Department of Engineering Science and Ocean Engineering, this project looks at ways to harvest the energy of ubiquitous and stable vibrations that permeate most environments. The team is also seeking ways to significantly reduce the need for recharging mobile devices and wireless sensor network nodes so as to extend battery life.

New-generation rolling shutter visible light communication project

In this project, the team integrates the rolling shutter technology already used on smartphones with visible light communication in LED lights and car lights as a means to transfer data. This technology makes indoor wireless data transmissions more secure. Its inter-vehicle M2M communication technology also has the potential of enhancing traffic safety among drivers.



Population Expert Talks about Marriage and Fertility in Asia

▲ A flyer announces the visit of population researcher Dr. Gavin Jones to the Population and Gender Studies Center last October.

The Population and Gender Studies Center invited renowned population researcher Dr. Gavin Jones to NTU to talk about trends in marriage, fertility, and international migration in Asia last October. Taiwan, along with other Asian countries like Japan and South Korea, has been experiencing a low fertility rate and increasing proportions of men and women who marry late or never marry. Dr. Jones presented an insightful lecture addressing the causes of these issues and their impacts on population structure, families, and societies and engaged in lively discussions pertaining to the issues facing Taiwan with the faculties and students at NTU and Tamkang University.

Dr. Jones pointed out that many countries, including Japan, Taiwan, and European nations, are experiencing extremely low fertility rates as well as high ratios of non-married and later-married individuals, especially women, in the younger generations

of their populations. These factors are all contributing to population depression and serious aging problems. His research on Asian marriage trends shows that both male and female SMAMs (singulate mean age at marriage) are positively related to PPP-adjusted GDP per capita and gross female tertiary education enrollment ratios. In other words, late-marriage trends are more likely to be observed in developed countries, such as Taiwan, South Korea, and Japan, rather than in developing countries, like Indonesia, China, and India.

Noting that elder care programs become an important policy issue for governments faced with low fertility rates and ageing population structures, Dr. Jones stated that population and all other social developments are closely linked and inseparable. He added that population issues are the results as well as the causes of social transitions, and that to deal with marriage and fertility problems one has to address the full range of economic and social issues, including employment, equality, education, housing, social security, political stability, food, energy, and environment.

Dr. Jones is the director of the JY Pillay Comparative Asia Research Center at the National University of Singapore, where he holds a joint appointment in the Department of Sociology. Oriented by a geographic focus on South-East and East Asia, in particular Indonesia, Malaysia, and Thailand, his broad interests include the determinants of marriage and fertility, issues of ageing, urbanization, population policy, and the relationships between population growth and economic development.

Teaching and Learning



▲ Prof. Ping-Cheng Benson Yeh and his students engage in discussion during a flipped classroom for his Probability course.



Instructors Enjoy Options for Learning about Flipped Classrooms

Prof. Ping-Cheng Benson Yeh, associate director of the Center for Teaching and Learning Development's Division of Teaching Innovation, organized the first Flipped Teaching Workshop at NTU at the end of 2013, becoming the first educator to open the curtain on the flipped classroom movement in Taiwan. Since then, numerous NTU professors have introduced this effective teaching approach in their courses, and primary and high school teachers have also begun to show an enthusiasm for the method.

With the traditional approach to teaching, instructors present unidirectional lectures in class while students complete homework independently outside the classroom. This method often deprives the students of the opportunity to be autonomous learners. In contrast, flipped classrooms entail having students prepare for class by watching video lectures online, and then taking advantage of their limited class time to do coursework, solve problems, and engage in discussions of the lectures together with their instructor and classmates. Using this method, the responsibility for learning is placed back in the hands of the students as instructors forfeit their original roles as leaders and become instead learning guides and assistants.

The Office of Academic Affairs has been encouraging NTU's instructors to apply the flipped classroom approach in their courses for any three week period following the midterm examinations


each 18-week semester. During this period, instructors are assisted with ideas on how to begin using the method in their classrooms through a variety of training sessions provided by the OAA.

Moreover, the CTLD in 2014 set up a flipped classroom development community for the university's instructors that takes the form of small classes to familiarize instructors with the concepts of this new teaching method. The center offers instructors in the community a basic training course that covers such topics as video recording and production, making use of the Institute for Information Industry's online learning platform, Proera, and setting up a basic video studio.

Last year, the organizers also added a session introducing flipped classrooms to NTU's annual orientation camp for new professors. The camp featured a booth that gave the new professors a chance to experience making a video.

The Flipped Teaching Workshop established by Prof. Yeh is an eight-week course that guides instructors through the practical issues of flipped classrooms. The workshop encourages its participants to use their own courses as material to familiarize themselves with the innovative teaching method.





▼ Deputy Director-General Yang Hung-chih of the Forestry Bureau raises a point during a discussion session.

Forum Addresses Ongoing Disputes over Co-management of Indigenous Land

In November, NTU's Center for Indigenous Studies and Taipei Medical University's Graduate Institute of Humanities in Medicine held a forum addressing the series of incidents and ongoing disputes that have emerged concerning the management of resources on indigenous lands in recent years. Drawing over three dozen participants, including representatives of the Council of Indigenous Peoples, the Forestry Bureau, the NTU Experimental Forest, as well as a variety of scholars and experts, the forum looked at the challenges and possibilities that have arisen in the wake of the government's enactment of the Regulations for the Co-management of Resources in Indigenous Areas. The regulation was established in hopes of coming up with ways to promote the feasibility of co-management of the disputed land.

Back in 2005, several men of the Atayal Tribe were arrested for harvesting wind-fall beech wood near the village of Smangus. Following the incident, a multitude of disputes have erupted between indigenous communities and the central government and universities, and NTU was one of the universities to have become embroiled. One incident involved the expansion of indigenous reserved land at the Highland Experimental Farm in 2013 while another involved the removal of ancient cypress trees at the NTU Experimental Forest last year.

In 2007, the central government implemented the Regulations for the Co-management of Resources in Indigenous Areas, a regulation that was established

in line with the rights to land and natural resources guaranteed to indigenous people under the Indigenous Peoples Basic Act. Despite the establishment of the co-management committee, disputes persisted between indigenous people and the resource management agencies over their divergent interpretations of the content, implementation methods, and applicable areas of the co-management rules. The conflicts have yet to subside.

In light of these discrepancies, the forum revealed that, under current regulations, the co-management committee set up by the existing competent authority lacks any power of enforcement; in effect, it has no real influence on policy, and remains in a simply advisory role. In other words, the committee's influence depended entirely upon whether the governmental authority of the time chooses to implement its recommendations. Moreover, the forum also concluded that the committee fails to recognize indigenous people's knowledge of the environment, limiting the role of the indigenous communities to that of providing labor.

Due to such factors, the current co-management regulations were deemed unable to either promote communication between the two sides or solve the problems impacting indigenous communities. The CIS and GIHM therefore suggested organizing public forums with individual indigenous groups and villages in order to promote a more sustained and diverse discussion as well as fulfill NTU's responsibility to serve as a positive influence on society.

What is a dugong? Colloquially known as the “mermaid,” the dugong is a mysterious marine mammal often found in warm coastal waters. Still puzzled? Stop by the Gallery of NTU History to see our complete dugong skeleton, and find out.

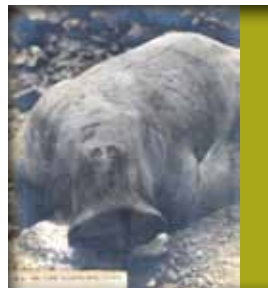
Did The first scholar to study Taiwan’s dugong was Kyosuke Hirasaka, a lecturer at NTU’s predecessor, Taihoku (Taipei) Imperial University. Besides describing the manatee-like marine mammal in journals, he once lectured on the curious-looking creature at a conference in Canada in 1933.

In one report, he speaks of receiving a letter in 1931 informing him of “a fantastic sea creature” that had been netted in Takao [Kaohsiung] Prefecture, leading to the researcher’s subsequent eagerness to obtain explicit evidence:

The personnel recovered the beast’s skull and rib bones from a rubbish dump and passed them

on to a specialist who happened to be in the vicinity and who ultimately conveyed the bone’s to my laboratory on April 22. Upon detailed inspection, I discovered the skull to have suffered damage due to the extraction of its teeth; based on the ribs, I could see its body was of bovine morphology; the remaining fetid flesh had grown maggots. Cleaning the bones, I confirmed this was in fact a dugong.

To this day, Hirasaka’s dugong bones remain preserved at NTU’s Museum of Zoology. Visitors are welcomed to learn more about the elusive sea creature at the museum’s special exhibition.



History Gallery Houses Skeleton of “Fantastic Sea Creature”



HALL CELEBRATES FESTIVALS WITH BOWLS OF SOUP AND PORRIDGE

The “Dongzhi” Winter Solstice Festival and “Xiaohan” Laba Festival are the two of the 24 annual holidays on the lunar calendar that are celebrated during the coldest time of the year. During this season, people traditionally consume restorative foods and begin making preparations for the Lunar New Year.

This winter, the NTU Agricultural Exhibition Hall invited people from on and off campus to celebrate the two holidays by offering tasty traditional treats.

For the Winter Solstice, the hall organized a roll-your-own soup balls event. The participants were guided in making soup balls, called *tangyuan*, by hand and then joined each other in gobbling down the delicious balls in bowls of sweet soup.

When Xiaohan rolled around on the eighth day of the twelfth lunar month, pots of Laba Eight Treasure Porridge were prepared and shared with students and members of the public in accordance with traditional folk customs. The organizers shared stories about the origins of the Laba Festival as the happy participants enjoyed their bowls of warm porridge.



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