



2023

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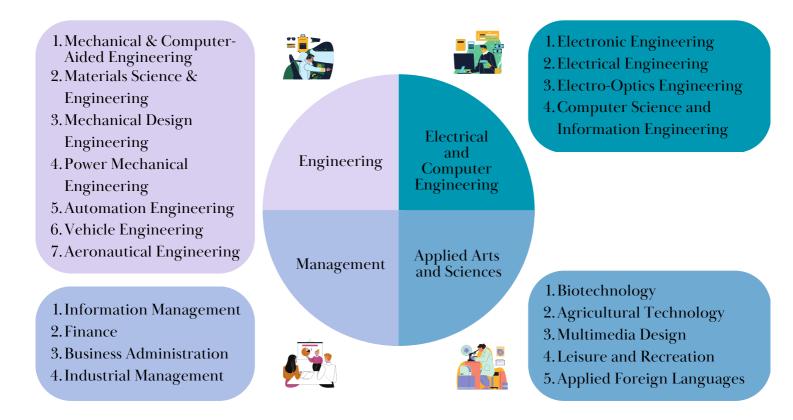
Introduction of National Formosa University

National Formosa University (NFU) is in central Taiwan with historical buildings and a beautiful farm landscape in Hu-Wei Township. Hu-Wei is a good living environment and convenient High Speed Rail transportation connected to the rest of Taiwan.

NFU is a top 5 technology university and we are famous for its research on mechanical engineering, aeronautical engineering, smart machinery, intelligent manufacturing and industrial management, etc.

NFU has 4 colleges and 20 departments; and, there are 18 Master Degree Program and 2 Ph.D. Degree Program.

Under the support of the Ministry of Education, we are pursuing international collaborative opportunities including the degree program, exchange program, talent internship and joint research with outstanding partner universities.





Features of Formosa TIP

Formosa Talent Internship Program (Formosa TIP) is an international collaboration established by National Formosa University, Taiwan.

Formosa TIP enhances the spirit of Taiwan Experience Education Program supported by the Ministry of Education.

Formosa TIP covers 4 areas including Engineering Technology Hub, Aviation Hub, Business Hub and English Tutor Hub for the talents training.

Formosa TIP encourages foreign students from partner Universities to participate in short-term professional internship projects at NFU Laboratories and Research Centers.

Formosa TIP features cultural immersion activities to improve language, cultural fluency and to ease participants into students' internship in Taiwan.

Formosa TIP helps foreign students communicate with Chinese speakers around the world while Taiwan is an ideal place for international students who want to learn Mandarin Chinese.

Formosa TIP allows international students to gain an in-depth educational experience in Taiwan, while also preparing themselves for the Asian job market.

By establishing the Formosa Talent Internship Program, National Formosa University would like to invite students to experience from the professional exchange courses and practice the research work in the following areas.



Formosa TIP HIIGHLIGHT RESEARCH

International Engineering Technology Talent Hub

- 1. Gear Research
- 2. Machine Diagnosis
- 3. Advanced Forging-Stamping & Engineering
- 4. Green Energy
- 5. Auto. Machinery & Robot Combination Sensing
- 6. Plasma & Surface Engineering
- 7. Biomechartronics
- 8. Smart Sensor and Actuator
- 9. Embedded System/ Multimedia Network Application
- 10. Fiber Optics Packaging
- 11. AI/ IoT Engineering System Design
- 12. Optical Sensor & System
- 13. Cloud Computing & Intelligent System

- 14. Machine Learning & Software/ Hardware Co-Design
- 15. Advanced Nano Optoelectronics
- 16. Electromagnetic Measurement
- 17. FPGA Circuits Design & Embedded Systems
- 18. Coherent Control
- Medical Device, Creative Design, Patenting Strategy, Technical Startup
- 20. Food Processing
- 21. Biomimetic Technology, Agricultural Wastes Reusing
- 22. Environmental Toxicology & Nano-Toxicology
- 23. Biophotonic & Biomaterials
- 24. Mixed Reality & Game AI Fiber Optical Com. & Sensing
- 25. User Interface Design/ User Experience (UX)





Formosa TIP hiighlight research

International Aviation Talent Hub

- 1. Aircraft Maintenance Training: 147 Cat. Al, Cat. Bl & Avionics
- 2. UAV Vehicle Design/Build/Flight: Fix Wing, eVTOL, Multi Rotor
- 3. UAV Traffic Management: Flight Control, Navigation, Guidance
- 4. UAV Applications: Cargo, Inspection, Agriculture
- 5. Airline Operators/Maintenance Management





Formosa TIP HIIGHLIGHT RESEARCH

International Business Talent Hub

- 1. Corporate Finance and Governance
- 2. High Frequent Data Analysis and Behavioural Finance
- 3. Assets Management and Portfolio Management
- 4. Securities Investment and Financial Analysis
- 5. Investment and Risk Management
- 6. FinTech and Carbon Emission Trading
- 7. Network System Design
- 8. Network Security
- 9. Information Analysis and Management
- 10. Fuzzy Decision Analysis
- Data Mining and Intelligent System Design

- 12. E-Learning and Mobile Commerce
- 13. Consumer Behavioural Analysis
- 14. Innovation and Entrepreneurship
- 15. Strategic Management
- 16. Retailing Marketing Management
- 17. Service Industry Management
- 18. Network Management
- 19. Supply Chain Management
- 20. Quality Management
- 21. Production Management
- 22. Operations Research and Decision Analysis
- 23. Mathematical Programming and AI Algorithms





Formosa TIP hiighlight research

International English Tutor Hub

Aim:

- Opportunities for Taiwanese students to interact with international students.
- **Ø** Pre-trained stage for Taiwanese candidates to overseas programs.
- **Ø** Diverse Culture and Bilingual Learning Environment.

Target:

- Ø Major in TEFL/TESL/TESOL/Education etc.
- Ø Native Speaker of English. €
- 𝗭 None-Native Speaker with B2 English Ability. 𝔅

CERF	TOEIC	NEW TOEIC	IELTS	TOEFL IPT	TOEFL IBT
C2 Mastery	950+	-	8.5+	630+	-
C1 Effective Operational Proficiency	880+	945+	7+	560+	95+
B2 Vantage	750+	785+	5.5+	527+	72+
B1 Threshold	550+	550+	4+	457+	42+





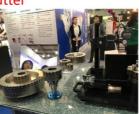
Gear Laboratory Department of Power Mechanical Engineering (PME) Distinguished Prof. Shinn-Liang, Chang, Ph.D. E-mail: <u>changsl@nfu.edu.tw</u> (NFU PRESIDENT)

Gear Design and Manufacture, Machine Tool Design and Manufacture, Precision Mechanism Design, Power Transmission, CAD/CAE.

Professor Chang has strong relation with the local industry in TAIWAN. He has more than 30 projects in the near 5 years. Most of the projects are supported by the companies. He also publish more than 150 papers. Until now, there are 56 students graduated from the lab. Some developed products co-operated with local companies are shown as follows:

High Precision Cutter



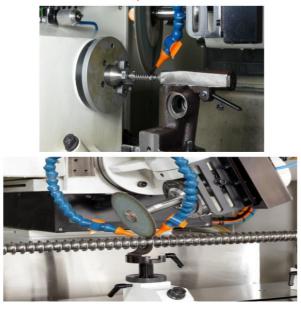


Special Cutter Design



Sections of the Catting Tools	Technical Analysis Graphs	Checking Back Culto
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Developed Machines



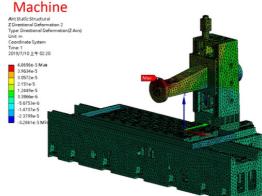
Non-circular Sprockets for Bicycles

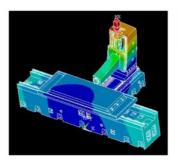


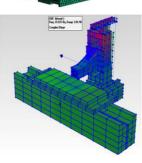
RV Reducer



Structural and Thermal Analysis of Grinding











Research field: Biomimetic technology, Agricultural wastes reusing. Department of Biotechnology Prof. Hsin Her Yu, Ph.D. Email: hhyu@nfu.edu.tw [Keywords]: Biomimetic applications, Nanomaterials, Polymers.

[research outline]

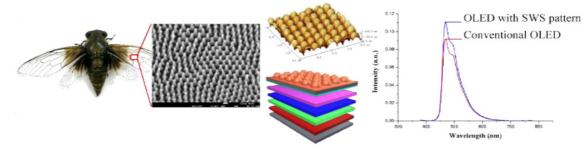
Our research are focus on the biomimetic applications and the innovation and reusing of agricultural wastes. We bioinspired the antireflective structure from the moth eyes and cicada-wings, and fabricated a biomimetic transparent brightness enhancement film and applied it on LEDs and OLEDs. We also prepared a discardable paper from waste oyster shells.



SEM images of the *Philosamia* cynthia ricini moth-eye structure



A moth-eye-bioinspired antireflective glass.



A high performance of transparent brightness enhancement film was biomimetic fabricated from the cicada-wing and applied it on OLEDs.

[Awards]

1. Gold Medal Award of the 2014 Taipei International Invention Contest.

2. Gold Medal Award of the 2019 Taiwan Innotech Expo -Invention Contest.

- 1. W.K. Kuo, J. J. Hsu, C. K. Nien, H. H. Yu^{*}, Moth-Eye-Inspired Biophotonic Surfaces with Antireflective and Hydrophobic Characteristics, ACS Applied Materials & Interfaces, 8(46), 32021-32030 (2016).
- J. Y. Shieh, J. Y. Kuo, H.P. Weng, and H. H. Yu*, Preparation and evaluation of the bioinspired PS/PDMS photochromic films by self-assembly dip-drawing method, Langmuir, 29, 667-672 (2013).

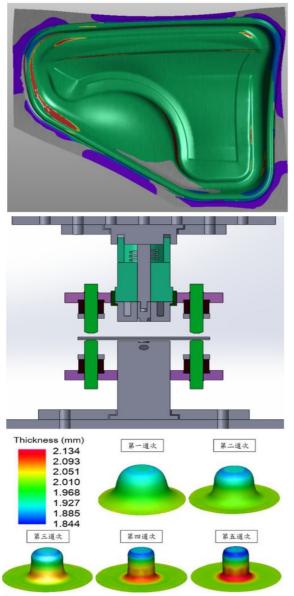


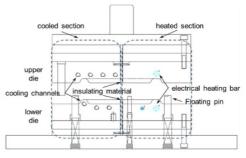


Advanced Forging-Stamping and Engineering Laboratory Department of Mechanical and Computer-Aided Engineering Associate Prof. Li-Wei Chen, Ph.D. Email: <u>liwei@nfu.edu.tw</u> [Keywords] Metal Forming, Stamping, Forging, Energy engineering

[research outline]

Dr. Li-Wei Chen's research focuses on analysis of forming processes and development of forming facilities – particularly auto body parts and hot forming parts. The present work involves both the simulation and experimental research. Many new forming tools have been developed by his lab, for instance hot stamping clinching tool, a tailored tempering tool, die wear detect tool and etc.





[Selected Publications]

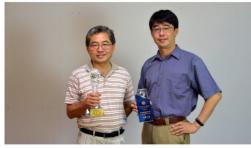
[1] Li-Wei Chen and Ming-Jhe Cai,Development of a hot stamping clinching tool,Journal of Manufacturing Processes, (2018).(SCI, IF 2.809)

 [2] Li-Wei Chen, Yung-Hung Chen and Yuan-Chuan Hsu ⁹ A Tailored Tempering Process for CSC-15B22 Steel Sheet, Journal of Manufacturing Science and Engineering, (2018). (SCI, IF 3.48)

[3] Li-Wei Chen, Application of PIV measurement techniques to study the characteristics of flame–acoustic wave interactions, Flow Measurement and Instrumentation,45, (2015), 308-317. (SCI, IF 1.203)

[4] Li-Wei Chen, A theoretical and experimental study on flow characterisation in an acoustically excited chamber, Wave Motion, 58, (2015), 68-76. (SCI, IF 1.575)



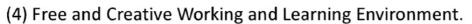


HALE & UAV Engineering Laboratory Department of Aeronautical Engineering Associate Prof. Chung-Yan Lin Ph. D., Prof. Huan-Jung Lin, Ph. D. and Prof. Cheng-Ying Lo, Ph. D. Email: frank.lin@nfu.edu.tw [Keywords] Solar HALE, Hybrid UAV, Quad-Copter UAV, Fix Wing UAV

[Research Outline]

- (1) Working on Mid-Large size RC aircraft more than 10 years.
- (2) Complete design/build/flight capability.
- (3) Move into Automation Flight area.









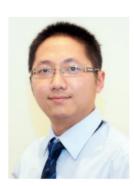










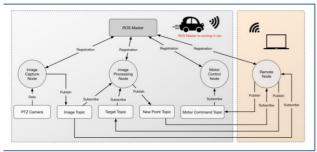


Department of Electrical Engineer, DSDL Labs Prof. Dr.-Ing. Chi-Chia Sun ccsun@nfu.edu.tw http://sparc.nfu.edu.tw/~ccsun/

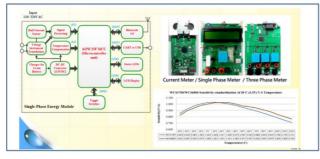
Field: FPGA, Robotic, IoT, AI, PCB



Prof. Dr.-Ing. Chi-Chia Sun received his B.S. and M.S. degree in Computer Science and Engineering from National Taiwan Ocean University (2000-2004) and Electronic Engineering from National Taiwan University of Science and Technology (2004-2006) respectively. From 2008 to 2011, he worked as a Research Assistant at Dortmund University of Technology and received his Doktor Ingenieur degree with DAAD full scholarship. His research interests are in FPGA System Integration, Internet on Thing, Robotic, Image Processing in AI and FPGA/MCU PCB design.



Robotic System Integration of SoC FPGA accelerated fast floor estimation method on a Ground UGV Rover. Real-Time Object Tracking based on Multi-Core ARM SoC FPGA using CNN network and Artificial Intelligence Technology.



0.1A~200A / 0.1V~2000V Multi-Node Power Meter Sensor using IOT technology for M2M purpose and its PCB Design, supporting LoRaWan and Bluetooth communication technology.

[Selected Publications]

- 1. Chi-Chia Sun*, Hou-En Lin, Cheng-Jian Lin and Yun-Zhen Xie, "A New Floor Region Estimation Algorithm Based on Deep Learning Networks with Improved Fuzzy Integrals for UGV Robots," Journal of Imaging Science and Technology, 2019. (SCI/EI)
- 2. Chi-Chia Sun*, Ming-Hwa Sheu, Jui-Yang Chi and Yan-Kai Huang, "A Fast Non-overlapping Multi-camera People Re-identification Algorithm and Tracking Based on Visual Channel Model," IEICE Transaction on Information and Systems, 2019. (SCI/EI)
- 3. Dwi Riyono, Chi-Chia Sun*, Jing-Ming Guo and KokSheik Wong, "A Novel Image Descriptor based on Dot-Diffused Block Truncation Coding with Bit Probability," Journal of Ambient Intelligence and Humanized Computing, 2018. (SCI/EI)
- 4. Chi-Chia Sun*, Yi-Hua Wang, Kai-Chieh and Ming-Hwa Sheu, "Fast Motion Object Detection Algorithm Using Complementary Depth Image on an RGB-D Camera," IEEE Sensors Journal, 2017. (SCI/EI)
- 5. Chi-Chia Sun*, Gene Eu Jan, Jheng-Yi Lin and Bor-Shing Lin, "VLSI Design of a RSA Encryption/Decryption Chip using Systolic Array based Architecture," International Journal of Electronics. 2016 (SCI/EI)

[About DSDL Labs]

Current our team has 2 PhD students, 8 Master students, 2 interns, 2 exchanges and 8 undergraduates. Rich research funding from MOST/MOE/MOEA and continue working on 2~3 practical implementations with industry partners on I-IoT, SoC FPGA, and M2M projects, qualified students will received NFU Scholarship (2018/19) plus an additional 'top-up' by the industrial partner.

- International PhD students who choose joint research projects will receive monthly scholarship ~900 USD including tuition fee waiver (see attached files).
- International Master Student receive monthly scholarship 400 USD, including tuition fee waiver (depend on evaluations).





Lab.: Flow Control Laboratory

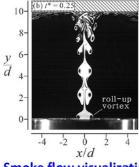
Department : Department of Mechanical Design Engineering **Principal Investigator:** Dr. Ching Min Hsu (Assistant Professor) **E-mail:** cmhsu@nfu.edu.tw

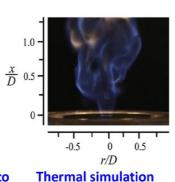
Research specialties: Fluid Mechanics, Heat Transfer, Aerodynamics, Flow Control

[research outline]

Researches relevant to *Flow Control* technique in fields of *Fluid Mechanics, Aerodynamics,* combustion, and *Heat Transfer* are investigated in Flow Control Laboratory. Some topics being studied are listed below:

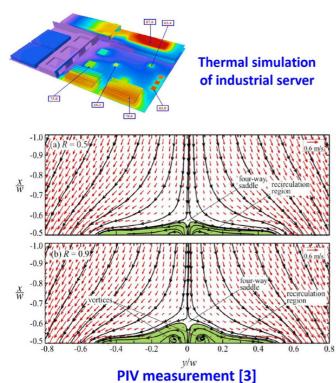
- (1) Flow characteristics and heat transfer of jet impingement modulated by using acoustic excitation technique.
- (2) Thermal managements of electronic components and equipment.
- (3) Controlling flow characteristics, vortex shedding, and aerodynamic performance of square cylinder by using a front jet injection.
- (4) Flame and flow characteristics of an excited swirling double-concentric combusting jet.





of industrial server [4]

Smoke flow visualization to jet impingement [1]



[Selected Publications]

[1] <u>Hsu*, C. M.</u>, Jhan, W. C., and Chang, Y. Y., "Flow and heat transfer characteristics of a pulsed jet impinging on a flat plate," accepted for publication by *Heat and Mass Transfer* on July 2, 2019.

[2] <u>Hsu*, C. M.</u>, Khan, F., and Mosiria, D. B., "Effects of pulsation intensities on flame characteristics of a small backward-inclined jet flame in crossflow," *ASME Journal of Thermal Science and Engineering Applications on*, Vol. 12 No.2, 2020, 021004 (10 pages).

[3] <u>Hsu*, C.M.</u> Huang, R. F., and Chung, H. C., "Flow characteristics and drag force of a square cylinder in crossflow modulated by a slot jet injected from upstream surface," *Experimental Thermal and Fluid Science*, Vol. 75, 2016, pp. 235-248.

 [4] <u>Hsu*, C.M.</u> and Loretero, M. E., "Flame and flow characteristics of an excited non-premixed swirling double-concentric diffusion flame," *Experimental Thermal and Fluid Science*, Vol. 62, 2015, pp. 58–69.

[5] <u>Hsu*, C. M.</u>*, Huang, R. F., and Loretero, M.
E., "Unsteady flow motions of an oscillating jet in crossflow," *Experimental Thermal and Fluid Science*, Vol. 55, 2014, pp. 77–85.





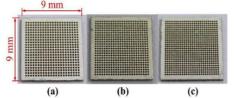
Smart Sensor and Actuator Laboratory Department of Mechanical Design Engineering Prof. Chun-Ching Hsiao, Ph.D. E-mail : cchsiao@nfu.edu.tw

[keywoeds] Pyroelectric sensors; Pyroelectric energy harvesters; Applications of sensors; Mechanism designs and Mechatronics applications; Thermal and residual stresses of thin films; CNC machining.

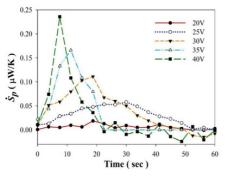
[research outline]

A High Aspect Ratio Micropattern in Freestanding Bulk Pyroelectric Cells The Generated Entropy Monitored by Pyroelectric Sensors

An integrated design to connect a mosaic tile puzzle machine with an automatic storage system Pyroelectric waste heat energy harvesting using the Olsen cycle on $Pb(Zr, Ti)O_3$ -Pb(Ni, Nb)O_3 ceramics Development of food machineries with diverse filling



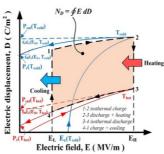
Fabricated PZT pyroelectric cells with high aspect ratio micro-patterns



Time evolution of the entropy generation rate (S_p) is



The actual photo for the system of the mosaic tile puzzle machine



Electric field, E (MV/m) The Olsen power cycle is shown and represented by the area

[Selected Publications]

[1] <u>Chun-Ching Hsiao*</u>, Shih-Yuan Yu, 2012, "Rapid deposition process for zinc oxide film applications in pyroelectric devices," Smart Materials and Structures, 21, 105012.

[2] <u>Chun-Ching Hsiao*</u>, Jia-Wai Jhang, An-Shen Siao, 2015, "Study on pyroelectric harvesters integrating solar radiation with wind power," ENERGIES, 8, pp. 7465-7477.

[3] <u>Chun-Ching Hsiao</u>*, An-Shen Siao, 2017, "A high aspect ratio micro-pattern in freestanding bulk pyroelectric cells," Energy Technology, DOI: 10.1002/ente.201700439.

[4] <u>Chun-Ching Hsiao</u>*, An-Shen Siao and Yi-Je Tsai, 2018, "A strategy for optimal energy conversion by pyroelectricity," International Journal of Green Energy, 15(13), pp. 780-788, https://doi.org/10.1080/15435075.2018.1529573

https://doi.org/10.1080/15435075.2018.1529573.

[5] An-Shen Siao, Ian M McKinley, Ching-Kong Chao, <u>Chun-Ching Hsiao</u>, Laurent Pilon*, 2018, "Pyroelectric waste heat energy harvesting using the Olsen cycle on Pb(Zr, Ti)O3-Pb(Ni, Nb)O3 ceramics," Journal of Applied Physics, 124(17), 174104, https://doi.org/10.1063/1.5037112.

[6] <u>Chun-Ching Hsiao*</u>, and Bo-Hao Liang, 2018, "The generated entropy monitored by pyroelectric sensors," SENSORS, 18, 3320, DOI: 10.3390/s18103320.





Roadmap of GEL's Biomass research

Green Energy Laboratory Department of Power Mechanical Engineering (PME) Prof. Shouyin (Ian) Yang, Ph.D. (Dean of International affairs) E-mail: <u>ianyang@nfu.edu.tw</u>

Combustion technology, Biomass energy, Pyrolysis, Gasification, Torrefaction, AloT/Combustion/Gasification system

Directing a research group studies the interfacial science among combustion, nanomaterials and energy conversion. Representative research projects are

- developing flame-based tools for synthesis and postprocessing of nanowires;
- enhancing combustion efficiency and reduce pollution emission by employing porous media;
- 3) advancing the efficiency of supercritical turbine technologies; and
- 4) developing the biomass and coal gasification technologies for high value chemical products

 Pyrolysis proces.

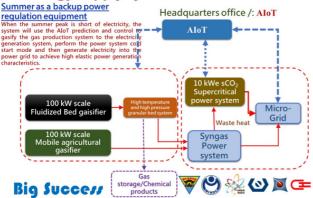
 Biomass

 0 Nying

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Research road map of Yang's Group

Biomass gasification with Super-critical cycle for energy supply system



Research of AIoT in Biomass Gasification and Supercritical sCO2 Power system

- S. I. Yang and S. S. Shy (2002) "Global Quenching of Premixed CH4/Air : Effects of Turbulent Straining, Equivalence Ratio, and Radiative Heat Loss." Proc. Combust. Inst., Vol. 29, pp. 1841-1847.
 - H. Y. Sun, S. I. Yang, G. Jomaas and C. K. Law (2007) "High-pressure laminar flame speeds and kinetic modeling of carbon monoxide/hydrogen combustion "Proc. Combust. Inst., Vol. 31, pp. 439-446
 - S. I. Yang, H. P. Wan and H. T. Lee (2008) "The filtration equipment's in energy and environment engineering", Chemical Technology, Vol. 181, pp. 134-150 °
- S. I. Yang^{*}, I. L. Chung and S. R. Wu (2012), " An experimental study of the influence of temperature on char separation in a moving granular bed", Powder Technology Vol. 228, 121-127.
- S. I. Yang, D. L. Hsu, (2013),"Heat-Transfer Mechanisms of Lean Premixed CH4/Air Flame in a Ceramic Granular Bed Burner" Combustion and Flame Vol. 160, pp. 692-703.
- S. I. Yang^{*}, M. S. Wu and C. Y. Wu, (2014)," Application of Biomass Fast Pyrolysis Part I: Pyrolysis Characteristics and Products" Energy Vol. 66, pp. 162-171.
- S. I. Yang*, T. C. Hsu, C. Y. Wu, K. H. Chen, Y. L. Hsu and Y. H. Li (2014),"Application of Biomass Fast Pyrolysis Part II: The Effects That Bio-oil Has on the Performance of Diesel Engines" Energy Vol. 66, pp. 172-180.
- S. I. Yang^{*}, M. S. Wu (2014)," Properties of premixed hydrogen/propane/air flame in ceramic granular beds" International Journal of Hydrogen Energy, Vol. 39, pp. 17347-17357.
- M.S. Wu, S. I. Yang^{*} (2016), "Combustion characteristics of multi-component Cedar Bio-oil/kerosene droplet", Energy Vol. 113, pp. 788-795.
- S. I. Yang^{*}, M. S. Wu, T. C. Hsu (2017) "Spray combustion characteristics of kerosene/bio-oil part I: Experimental study", Energy, Vol. 119, pp. 26-36
- S. I. Yang^{*}, T. C. Hsu, M. S. Wu (2016) "Spray combustion characteristics of kerosene/bio-oil part II: Numerical study", Energy, Vol. 115, pp. 458-467.
- S. I. Yang^{*}, M. S. Wu, T. C. Hsu (2017)" Experimental and Numerical Simulation Study of Oxycombustion of Fast Pyrolysis Bio-oil from lignocellulosic biomass" Energy, Vol. 126, pp854-867.
- S. I. Yang^{*}, M. S. Wu (2017)" The Droplet Combustion and Thermal Characteristics of Pinewood bio-oil from Slow Pyrolysis" Energy, Vol. 141, pp.2377-2386.

Green

Energy Laboratory, NEU

- 2011, The 1st Productivity Award-Group-Industrial Basic Technology Deep Harvest Award in Taiwan
- 2014, National of Formosa University, Excellent Teacher.
- 2016, Academic Research Excellence Award of National Formosa University

緑色能源 實 驗 室





Coherent Control Laboratory (CCL) Department of Electro-optics Engineering Prof. Chungpin (Hovering) Liao, Ph. D. (from MIT, USA) Email: cpliao@alum.mit.edu [Keywords] Chlorophyll battery, Variation of G, Pheophytin Fuel Cell, DNA Fuel Cell.

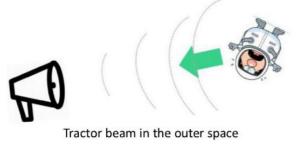
[Research Outline]

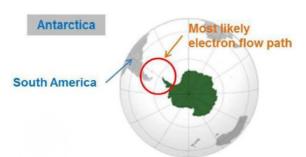
Viewing the capricious world out there as interference among matter waves and attempting to vary it through the perspective of wide-sensed photonic coherent control, we vow to come up with novel inventions covering all disciplines for a better tomorrow of the whole mankind. By far the attacked domains include: communication, alternative energy, foods, evolution, medication, environment, and life qualities, etc. The cornerstone of this mission has been a collective task team of brilliant young men and women who were culled and inspired to eventually become idiosyncratically capable idea generators, erudites, and problem solvers on wide-ranging, even wild, topics. Currently, the main academic focuses of CCL are: merging light and electrons, light and magnets, light and gravity in the light frequency range; erecting the tie of light interference and in-situ protein generation for living organisms in general, etc.



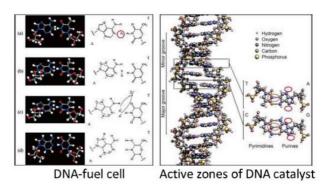


My artworks





Alteration of gravitational constant G



Latest publications, patents, and awards: check out ResearchGate page: <u>http://www.researchgate.net/profile/Chun</u> <u>gpin Liao</u> and www.arbl.org

Cause of El Nino and La Nina





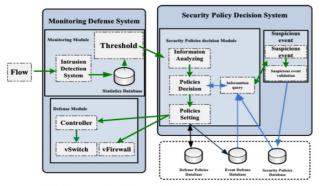
Embedded Multimedia Network Application Lab Department of Electrical Engineering Associate Prof. Hui-Kai Su, Ph. D. E-Mail: hksu@nfu.edu.tw [Keywords] Computer Networks, Network Multimedia Applications, Internet of Things, Embedded System, Automatic Control System, Network QoS Control and Management, Network Security

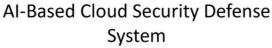
[research outline]

Prof. Su joined the department of electrical engineering, Formosa University, in the spring of 2009. His research interests include internet of things, multimedia network applications, embedded systems, network security, automatic control, etc. Since February 2012, he received 43 projects. The total budget is 17,406,308 NTD. The amount of technology transfer to industries is 1,901,692 NTD.



Cyber Physical System and Automatic Control System





- Hsing-Chung Chen, and Hui-Kai Su, "A Cooperative Trust Bit-Map Routing Protocol Using the GA Algorithm for Reducing the Damages from the InTs in WANETs," Journal of Internet Services and Information Security, vol. 4, no. 4, pp. 52-70, Nov 2014. (Directory of Open Access Journals (DOAJ), Google Scholar)
- Hsing-Chung Chen, Cheng-Ying Yang, Hui-Kai Su, Ching-Chuan Wei and Chao-Ching Lee, "A Secure E-Mail Protocol Using ID-based FNS Multicast Mechanism," Computer Science and Information Systems, vol. 11, no. 3, August 2014. (SCI-Expanded)
- Maw-Lin Leou, Chien-Min Wu, Yi-Ching Liaw and Hui-Kai Su, "An Orthogonalized Blind Algorithm for Hybrid of Adaptive Array and Equalizer," International Journal of Communication Systems, vol. 27, no. 2, pp. 201-215, Feb 2014. (SCI-Expanded) (DOI: 10.1002/dac.2349)
- Chi-Chang Lu, Chung-Hsien Wu and Hui-Kai Su*, "Intelligent Infant Monitoring System Involving a Wi-Fi Wireless Sensor Network," The 14th International Conference on Intelligent Information Hiding and Multimedia Signal Processing (IIH-MSP 2018), Sendai, Japan, Nov. 26-28, 2018.
- Hui-Kai Su*, Jia-Long Hu and Ze-Yu Zheng, Chi-Hsuan Han, and Yi-Zu Tu, "Design and Implementation of Bicycle Testing Platform with Automatic Image Processing," 2018 IEEE International Conference on Consumer Electronics - Taiwan (IEEE ICCE-Taiwan 2018), Taichung, Taiwan, May 19-21, 2018.





Machine Learning and Software/Hardware Co-design Lab. Department of Computer Science and Information Engineering (CSIE) Associate Prof. Yuan-Pao Hsu, Ph. D. (Chairman of CSIE) Email: <u>hsuyp@nfu.edu.tw</u> [Keywords] Software/Hardware Co-design, Robot Control, Machine Learning

[Research Outline]

We have been building a variety of robots, e.g. a bi-copter, a wheeled robot, a unicycle, and a quadrotor, which were all controlled by FPGA-based systems.

[1] Bi-copter

A bi-copter has been designed and implemented. The drone is controlled by a FPGA-based system using PID controllers.



Bi-copter

[2] Three-omnidirectional-wheel robot



Three-omnidirectional-wheel robot

A three-omnidirectional-wheel robot has been implemented, equipping with odometers and a LRF (Laser Range Finder), to perform indoor positioning task by the EKF (Extended Kalman Filter) algorithm. This work uses a FPGA-based platform to capture the data of the LRF and motor encoders and output control values to drive the wheeled robot.

- Yuan-Pao Hsu and Bo-Tang Shih, "An SoPC-based Object Tracking Quadrotor," Journal of the Chinese Institute of Engineers, 39 (3) pp. 254-264 (2016)
- [2] Yuan-Pao Hsu and Sheng-Han Huang, "Balance Control of a Wheeled Inverted Pendulum Based on Image Data," Journal of the Chinese Society of Mechanical Engineers, 35 (5) pp. 419-426 (2014)
- [3] Yuan-Pao Hsu and Wei-Cheng Jiang, "A Fast Learning Agent Based on the Dyna Architecture," Journal of Information Science and Engineering (JISE), 30 (6) pp. 1807-1823 (2014)
- [4] Kao-Shing Hwang, Hsin-Yi Lin, Yuan-Pao Hsu, Hung-Hsiu Yu, "Self-organizing state aggregation for architecture design of Q-learning," Information Sciences, 181, pp. 2813-2822 (2011)





Service Science and User Experience (UX) Laboratory Department of Business Administration Associate Prof. Chih-Chin Liang, Ph. D. Email: chihchin@nfu.edu.tw [Keywords] Service Science, Data Mining, E-commerce, Consumer Behavior, E-marketing, Brainwave, Eye Movement, Facial Recognition, Vital Analysis, Virtual Reality

Our research interests are service science, service design and service quality management. In UX experience research, we analyze customer experiences through vital signal and try to find marketing way. Additionally, this UX lab is tending to provide the service of analyzing vital signals to ones interested in marketing events.



Interview Room



Experiment Room

- [1] C. C. Liang, "Enjoyable Queuing and Waiting Time", Time & Society, Accepted (2017).
- [2] C. C. Liang, N. L. Nguyen, "Marketing Strategy of Internet-Banking Service Based on Perceptions of Service Quality in Vietnam," Elect. Commerce Research, Accepted (2017).

- [3] C. C. Liang, "Purchase Intention of Males and Females through Social Media," Intern. Jour. of Cust. Relat. Mark. and Manag., 8(3), 1-17 (2016)
- [4] C. C. Liang, H. Luh. "Solving two-dimensional Markov chain model for call centers," Indust. Manag. & Data Syst., 115 (5), 901-922 (2015).
- [5] C. C. Liang, "Queueing Management and Improving Customer Experience: Empirical Evidence regarding Enjoyable Queues," Jour. of Cons. Mark., 33(4), 257-268. (2016).
- [6] C. C. Liang, Y. T. Wang, Y. C. Chu, S. H. Lin, Y. C. Chen, "Impulsive Buying Behavior of Otaku Undergraduate Students," Market. Rev., 20(2), 139-160. (2015)
- [7] C. C. Liang, H. T. Dang, "Factors Influencing Office-Workers' Purchase Intention though Social Media: An Empirical Study," Inter. Jour. of Cust. Relat. Mark. and Manag. (IJCRMM), 6(1), 1-16. (2015).
- [8] C. C. Liang, P. H. Chen, J. S. Chen, M. C. Xiao, Y. P. Lin, "The Shape of Queue and the Number of Waiting People Affecting Customer Willingness to Queue," Market. Rev., 11(4), 309-330 (2014)

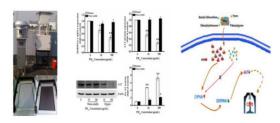




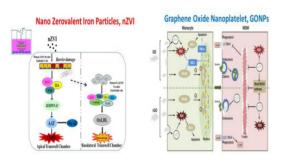
Environmental Toxicology and Nanotoxicology Laboratory Department of Biotechnology Associate Prof. Chia-Hua Lin, Ph.D. Email: vicchlin@nfu.edu.tw [Keywords] Nanobiotechnology, Cancer Therapy, Nanotoxicology, Environmental Toxicology.

[research outline]

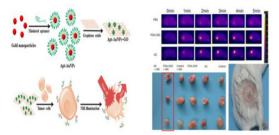
Our researches are focus on the environmental toxicology, nanotoxicology and nanobiotechnology. The goals of environmental- and nano-safety assessment is to design strategies to improve understanding of the human health and environmental effects associated with exposure to nanomaterials and environmental toxic substances (PM0.1-2.5 and micro-/nano-plastics). The second objective of my research involved the development of nanomaterials with anti-cancer (photothermal and photodynamic therapy) and antibacterial activity.



PM_{2.5} exposure increases the risk of COPD



Nanomaterials have the potential to induce pulmonary, cardiovascular and immune toxicity



Nanomaterials is able to induce a photothermal effect against breast cancer

[Selected Publications]

[1] Dong et al. (2019) Polystyrene microplastic particles: In vitro pulmonary toxicity assessment.
Accepted by *Journal of Hazardous Materials*.
(SCI, I.F.=7.650)

[2] Dong et al. (2019) Assessment of the pulmonary toxic potential of nano-tobacco stempyrolyzed biochars. *Environmental Science:* Nano, 6, 1527-1535. (SCI, I.F.=7.704)
[3] Yan, et al. (2017) ROCK inhibitor Y-27632 attenuates early endothelial dysfunction caused by occupational environmental concentrations of carbon black nanoparticles. *Environmental Science: Nano*, 4, 1525-1533. (SCI, IF: 7.704)
[4] Yan et al. (2017) Carbon black aggregates cause endothelial dysfunction by activating ROCK. *Journal of Hazardous Materials*, 338, 66-75. (SCI, IF: 7.650)

[5] Yu et al. (2016) Improved Anticancer Photothermal Therapy using the Bystander Effect Enhanced by Antiarrhythmic Peptide Conjugated Dopamine-Modified Reduced Graphene Oxide Nanocomposite *Advanced Healthcare Materials*, 6, 1600804. **(SCI, IF: 6.270)**

[6] Yang et al. (2015) Photothermal therapeutic response of cancer cells to aptamer-gold nanoparticle-hybridized graphene oxide under NIR illumination. *ACS Applied Materials & Interfaces*, 7,





Food Processing Laboratory Department of Biotechnology Assistant Prof. Chung-Yi Wang E-mail: cywang@nfu.edu.tw [Keywords] Food Processing and Preservation, High Pressure Processing, Microbial risk analysis.

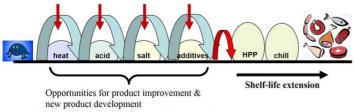
[research outline]

Our research interests are in development of innovative nonthmal processing on the safety, nutritional and health aspects of food products.



Laboratory high pressure processing(HPP) equipment

By adding new hurdles, the relative level or concentration of existing (less preferred) hurdles may be reduced



HPP-based hurdle technology

[Awards]

- 1. Young outstanding Alumni Awards from NPUST, 2018.
- 2. Food Technology Honor Award from Taiwan Association for Food Science and Technology, Taiwan, 2014.

- 1. Huang HW, Hsu CP, Wang CY. (2019). Healthy expectations of high hydrostatic pressure treatment in food processing industry. J. Food Drug Anal. Accepted, In press.
- 2. Huang HW, Wu SJ, Lu JK, Shyu YT, Wang CY. (2017). Current status and future trends of high-pressure processing in food industry. Food Control. 72, 1-8.
- 3. Wang CY, Huang HW, Hsu CP, Yang BB. (2016). Recent advances in food processing using high hydrostatic pressure technology. Crit. Rev. Food Sci. Nutr. 56, 527-540.
- 4. Huang HW, Hsu CP, Yang BB, Wang CY. (2014). Potential utility of high pressure processing to address the risk of food allergen concerns. Compr. Rev Food Sci F. 13, 78-90.
- 5. Huang HW, Hsu CP, Yang BB, Wang CY. (2013). Advances in the extraction of natural ingredients by high pressure extraction technology. Trends Food Sci. Tech. 33, 54-62.



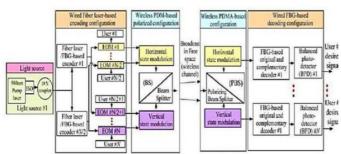


Fiber Optical Communication and Sensing Laboratory Department of Electro-optics Engineering (EOE) Prof. Hsu-Chih Cheng, Ph. D. (Chairman of EOE) Email: chenghc@nfu.edu.tw [Keywords] Optical Fiber Communication, Wireless Optical Communication, Optic Sensing, and Optical Coherence Tomography

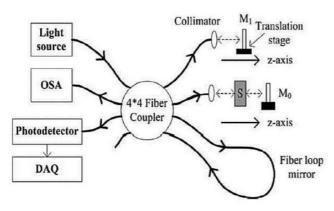
[Research Outline]

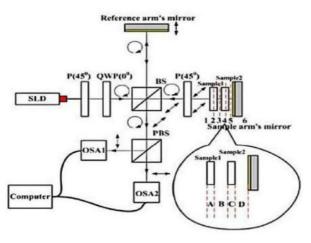
The Fiber Optical Communication and Sensing Laboratory is devoted to the study of Optics fiber technology. Our research activities can be categorized into three major areas:

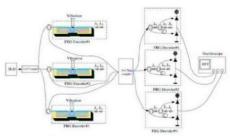
- (1) Optical communication system for Wired and Wireless Communications;
- (2) Optical coherence tomography ;
- (3) Fiber optics sensor system



Optical communication system for Wired and Wireless Communications







Fiber Optics sensor system

- [1] H. C. Cheng and C. T. Huang, "Measurement of Thickness and Refractive Index of Optical Samples Simultaneously Using Full-Range One-Shot Frequency-Domain Optical Coherence Tomography," Fiber and Integrated Optics, 34 (3), pp.171-182, (2015).
- [2] Y. T. Chang, C. L. Wu, and H.C. Cheng, "The Enhanced Locating Performance of an Integrated Cross-Correlation and Genetic Algorithm for Radio Monitoring Systems," Sensors, 14 (4), pp.7541-7562 (2014).
- [3] H. C. Cheng, C. T. Yen, and Y. J. Xiao, "Measurement of Arbitrary Strain Profiles of Fiber Bragg Gratings in Fabry-Perot-like Transmission Spectra by Using a Real-coded Genetic Algorithm," Sensors and Materials, 26(5) pp. 299–306 (2014).
- [4] C. T. Yen, I. J. Ding, H. C. Cheng, J. W. Ye, and J.M. Shih, "Integrated multi-object taguchi method with optical design for contact lenses," App. Mech. and Mater., 479-480, pp.166-169 (2014).





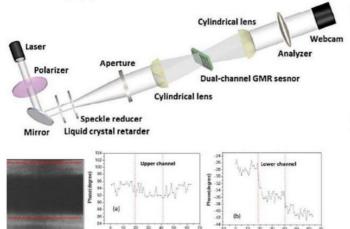
Optical Sensor and System Laboratory Department of Electro-optics Engineering Prof. Wen-Kai Kuo, Ph. D. (Dean of Office of International Affairs) Email: wkkuo@nfu.edu.tw [Keywords] Guided-mode Resonance (GMR), Surface Plasmon Resonance (SPR), Electro-optic Probing

[Research Outline]

Our research interests are development of optical sensor devices and system. We use nanoimprinting process to fabricate subwavelength grating structure on guided-mode resonance (GMR) and surface plasmon resonance (SPR) devices for sensor and filter applications. Both FDTD (finite-difference time-domain) and RCWA (rigorous coupled-wave analysis) software are used to simulate and design the devices. We have developed a high-sensitivity and parallel phase detection method for the GMR and SPR sensors.

[1] Tunable sensitivity phase detection system

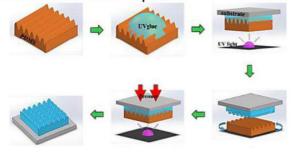
We developed novel phase detection systems to have tunable sensitivity and high throughput screening for bio-sensing applications.



Transmitted-type dual-channel GMR sensor system based on phase-shift interferometry

[2] Nanoimprinting process

We developed novel nanoimprinting process to precisely control the nanostructure dimensions and implement different nanostructure shapes.



- [1] W. K. Kuo and Y. M. Chang, "Implementation of a narrowband guided-mode resonance optical filter using the multiple-mold replica method in the nanoimprinting process," Appl. Opt., 56 (1), pp.99-104 (2017).
- [2] W. K. Kuo, H. P. Weng, J. J. Hsu, H. H. Yu, "A bioinspired color-changing polystyrene microarray as a rapid qualitative sensor for methanol and ethanol," Mat. Chem. and Phy., 173, pp.285-290 (2016).
- [3] W. K. Kuo, S. H. Syu, P. Z. Lin, and H. H. Yu, "Tunable sensitivity phase detection of transmitted-type dual-channel guided-mode resonance sensor based on phase-shift interferometry," Appl. Opt., 55 (4) pp.903-907 (2016).
- [4] W. K. Kuo, H. P. Weng, J. J. Hsu and H. H. Yu, "Photonic Crystal-Based Sensors for Detecting Alcohol Concentration," Appl. Sci., 6, 67 (2016).
- [5] W. K. Kuo, G. F. Kuo, S. Y. Lin and H. H. Yu, "Fabrication and characterization of artificial miniaturized insect compound eyes for imaging," Bioinspir. Biomim. 10, 056010 (2015).
- [6] W. K. Kuo, N. C. Huang, H. P. Weng, and H. H. Yu, "Tunable phase detection sensitivity of transmitted-type guided-mode resonance sensor in a heterodyne interferometer," Opt. Express,. 22 (19) pp.22968-22973 (2014).



Application Calendar, Fee & Sponsorship					
Item	Spring	Fall	Summer	Customized	
Participants	3rd–4th Years Bachelor Students Master Degree Students		Bachelor Students Master Degree Students		
Program Duration	20 Feb–20 Jul	28 Aug–26 Jan	26 Jun–18 Aug	Customized	
Application Deadline	31 Dec	30 Jun	12 Apr	Customized	
	NTD 36,000 / 1 Student (Around USD 1,200)		NTD 18,000 / 1 Student (Around USD 600)		
	 9 Credits of 1 Project Work for Laboratory Internship 9 Credits of 3 Professional Courses 		• 3 Credits of 1 Project Work for Laboratory Internship	Customized	
Tuition & Miscellaneous Fee	 Medical & Accident Insurance (during Staying in Taiwan since Second Month) Short Term Program Type Health Examination MMR Vaccination (in case of the processory after health examination) 				
NFU	~	,000 / 1 Student USD 1,000)	Up to NTD 12,000 / 1 Student (Around USD 400)	Customized	
Sponsorship	Reimbursed Item: Partial Airfare or Accommodation Fee				



Scan QR Code for Online Application:



Connection with Degree Program

How does Formosa Program Connect to Master/ Ph.D. Degree Program?

- (1) Submitting application in May/November during Formosa TIP
- (2) Formosa Interns qualified for admission enrollment from the Department
- (3) The credits from the Internship could be transferred to Degree Program

Scholarship	Contents	Condition
NFU Scholarship	 A. Tuition Wavier B. Monthly Stipend: Master- up to NTD 8,000 Ph.D. – up to NTD 15,000 Based on an individual's English proficiency and academic performance. 	Applicants for NFU Scholarship must apply directly to NFU for admission.
MOE Elite Scholarship for "Lecturers" from South and Southeast Asian Countries	 A. Tuition paid by MOE Scholarship B. Monthly Stipend: 1st year: up to NTD 10,000 2nd ~ 3rd year: up to NTD 18,000 	Applicants for Elite Scholarship must send its CV and lecturer certificate to NFU.
MOE Taiwan Scholarship	 A. Tuition and miscellaneous expenses: up to NTD 40,000 each semester paid by MoE Scholarship B. Living Allowance: Master/ Ph.D. Degree studies with a monthly stipend of NTD 20,000 	Applicants for a Taiwan Scholarship must apply directly to NFU for admission.

Inquiry about Customized Program

<u>prjoia@gs.nfu.edu.tw</u> Project Coordinator, (Ms.) Pei-Rong (Peggy) Jiang Division of International Academic Affairs Office of International Affairs, National Formosa University



Reference of Student Personal Expense

A. NFU Dormitory

Old Dorm Building

- (1) One single bed around USD 240 per student per semester
- (2) Female dorm a shared suite for 4 students a shared bathroom for two suites
- (3) Male dorm a shared room for 5 students

a public bathroom for one whole dorm

- (4) The rent includes the utilities bill (except for the air condition fee)
- (5) Using the air condition needs a pre-payment card
- (6) Public facilities: kitchen and laundry room

New Dorm Building

- (1) One single bed around USD 350 per student per semester
- (2) Female dorm a shared suite and bathroom for 4 students
- (3) Male dorm a shared suite and bathroom for 4 students
- (4) The rent does not include the utilities bill
- (5) Using all the electrical devices need a pre-payment card
- (6) Public facilities: kitchen and laundry room



Reference of Student Personal Expense

B. Private Accommodation

- (1) A share apartment near campus
- (2) Around USD 150 per month (actual price depends on the layout and decoration, it could be between USD 100 and USD 300 approximately)
- (3) One-month guarantee deposit is needed
- (4) The guarantee deposit will be returned when moving out if there is not any damage.
- (5) The utilities bill (water/electricity/gas) is excluded from the rent.

C. Living Cost - around USD 1,750 for five months

- (1) Around USD 350 per month
- (2) Utilities Bill (water/electricity/gas)
- (3) Food and other staples
- (4) Shopping, traveling or another personal needs

D. Taiwan Cellphone SIM Card - around USD 35 (one month)



Location of National Formosa University





Scan the QR Code to Find More Highlight Spots from Hu-Wei Township Google Map



Hu-Wei Township Exploration

Hu-Wei Sugar Factory

This factory helped Hu-Wei Township earn the name "Sugar Town" due to the success of the business, established 1906 by the Japanese, and it's one of the two remaining sugar factories that are still in production now. They also preserved the old equipment and trains during second world war II for display.





Hu-Wei Township Exploration

Hu-Wei Rail Station

Hu-Wei Sugar Cane Railway Station, the old railway station built for the Sugarcane Factory of Hu-Wei, you can get drinks and souvenirs here.





Hu-Wei Township Exploration

Steel Bridge

The most iconic spot of Hu-Wei, it was the route from the sugarcane fields directly to the factory, people then has to share the bridge with the trains, which is a dangerous thing, in order to solve that, the government built another two bridges, and this one became a landmark of Hu-Wei ever since.

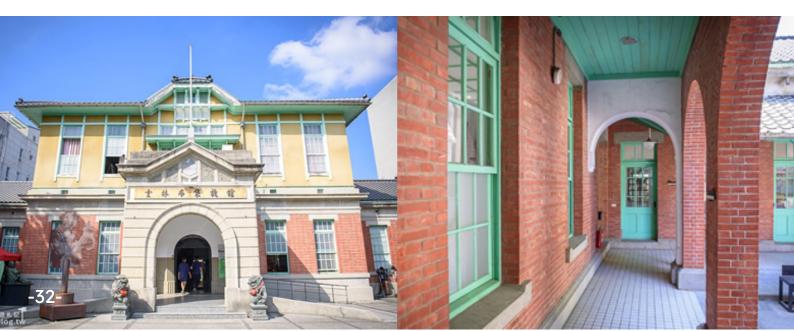




Hu-Wei Township Exploration

Yunlin Glove Puppetry Museum

Yunlin Glove Puppetry Museum exhibits the development history of Yunlin County's puppetry arts as well as a variety of static puppets. Designed based on puppetry, the Museum aims to promote the development of traditional puppetry in Yunlin County to the public and preserve the arts in order to prevent the artifacts and culture from being lost. The establishment of the Puppetry Museum allows the visitors to experience the puppetry culture, understand the history of the puppetry and therefore identify these traditional arts.





Hu-Wei Township Exploration

Yunlin Story House

Yunlin Story House was constructed from 1920 to 1923. It was the former residence of the Hu-Wei County Magistrate, subordinate of Tainan Prefecture, during the Japanese colonial period. It was constructed according to classic Japanese architectural design.





Hu-Wei Township Exploration

Eslite bookstore & Starbucks

The original purpose of this building was a police station, after renovation, it became a combination of bookstore and Café.





Hu-Wei Township Exploration

Chifa Mazu Temple

Mazu is a Chinese sea goddess. The Mazu Temples can be found from many places in Taiwan while the Chifa Mazu Temple here is famous with its elegant, neat and historical art from the building.





Tourism - Northern Taiwan

<u>Taipei 101</u>

Formerly the world's tallest structure, a visit to Taipei 101 is a must-see attraction for anyone visiting Taipei. On a clear day, you can take in some of the best views in Asia and see all the way down to the Taiwan straits, as well as clear views of the mountain of this beautiful island.

National Palace Museum

The National Palace Museum has a permanent collection of nearly 700,000 pieces of Chinese artifacts and artworks, making it one of the largest of its type in the world. The collection encompasses items spanning 8,000 years of Chinese history from the Neolithic age to the modern period. The National Palace Museum shares its roots with the Palace Museum in the Forbidden City of Beijing, whose extensive collection of artwork and artifacts were built upon the imperial collections of the Ming and Qing Dynasties.

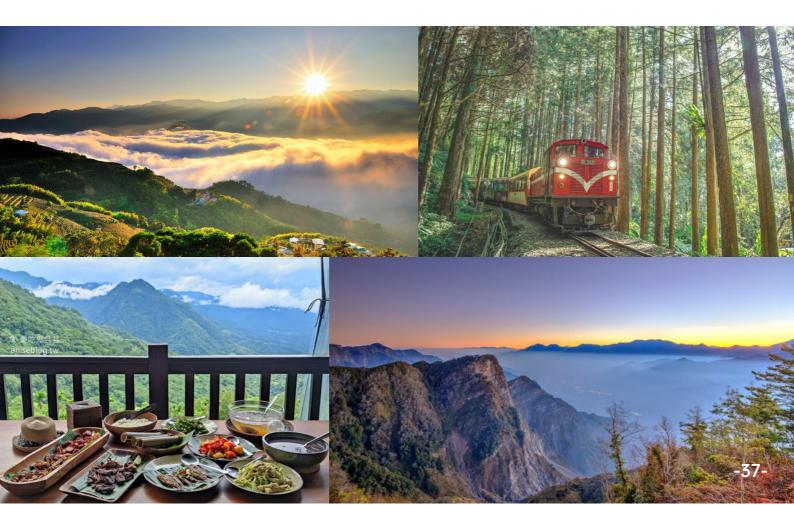




Tourism - Central Taiwan

Alishan National Scenic Area

Alishan, one of Taiwan's most revered tourist attractions, is a beautiful alpine area that is definitely worth visiting when you visit Taiwan. Neatly tucked away along Ali Mountain is the Alishan National Forest Recreation Area – a sprawling park that sits around 2,200 Meters high above sea level and covers more than 1,400 hectares. With its misty forests filled with sacred trees, beautiful historic railway, stunning hiking trails, and the rich indigenous culture of the Tsou Tribe, it's hard to resist a trip here.

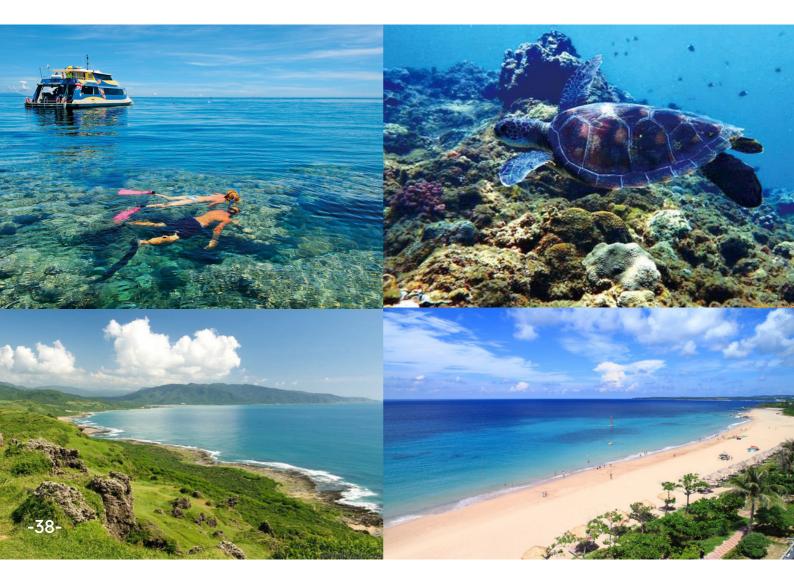




Tourism - Southern Taiwan

Kenting National Park

Kenting National Park is located on the Hengchun Peninsula of Pingtung County and well known for its tropical climate and sunshine, beautiful mountains and beaches. It is Taiwan's oldest and the southernmost national park on the main island, covering the southernmost area of the Taiwan island along Bashi Channel. Go snorkeling and have a trip to the ocean!





Tourism - Eastern Taiwan

East Coastline

Taitung has the ocean in front and high mountains at its rear, which give it a rich ecological and agricultural variety. Besides, there are high mountains, a rift valley, and ocean; here you can wander through a borderless natural classroom, forget your troubles and fully experience all this beautiful land has to offer, including a slower pace of life!





If you have the ambition and willing to strive, excelsior, the bright future would be yours. Welcome to Join National Formosa University!





NATIONAL FORMOSA UNIVERSITY





No.64, Wunhua Rd., Huwei Township, Yunlin County 63201, Taiwan