



# *National Chiayi University*

## Department of Biomechatronic Engineering



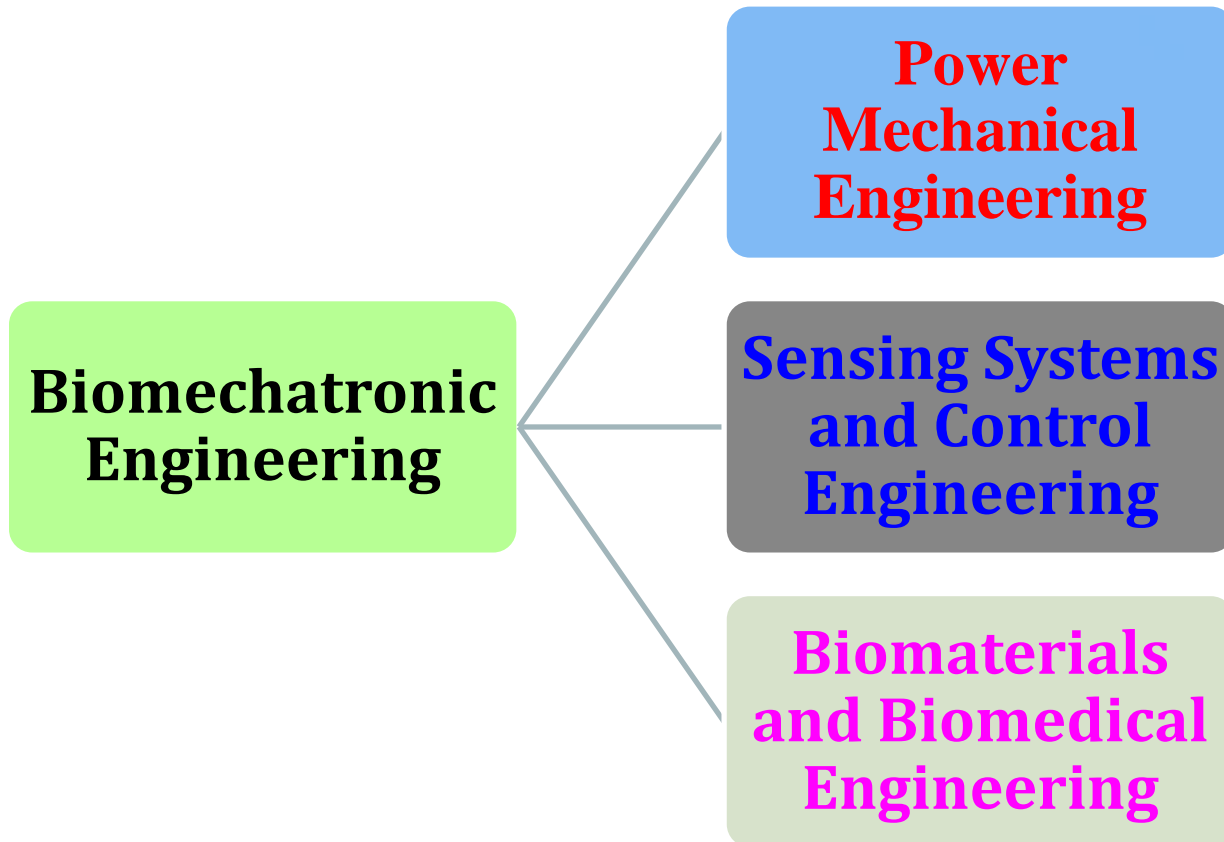


## Department of Biomechatronic Engineering at NCYU

- faculty members: 15
  - Professor: 8
  - Associate Professor: 3
  - Assistant Professor: 4
- students: Under: 337
  - Master: 47



# Teaching and Research







# Facilities & Instruments



**Electronics Lab.**



**UAV**



**Biological Industry Machinery**



**Computer Lab.**



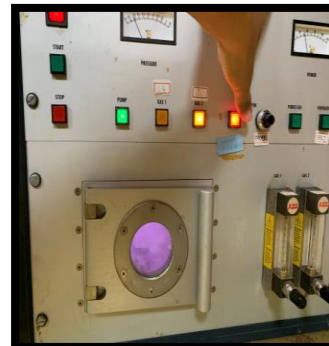
**Internal Combustion Engine**



**Mechatronics Lab.**



**Pneumatics Logic Control Lab.**



**O<sub>2</sub> Plasma**



**CNC Lathe**





艾群 終身特聘教授 Life-time Distinguished Professor  
Chyung Ay, PhD

**Research Area:** Automatic Control, Environment Control

Tel: 886-5-271-7650, E-mail: cay@mail.ncyu.edu.tw

## Research Interests:

### Development of automation technique in biomechatronics engineering:

1. Design of AI agricultural robot
2. Design of Micro-nano Systems



Headphone





林正亮 教授 Professor **Jeng-Liang Lin**, Ph.D

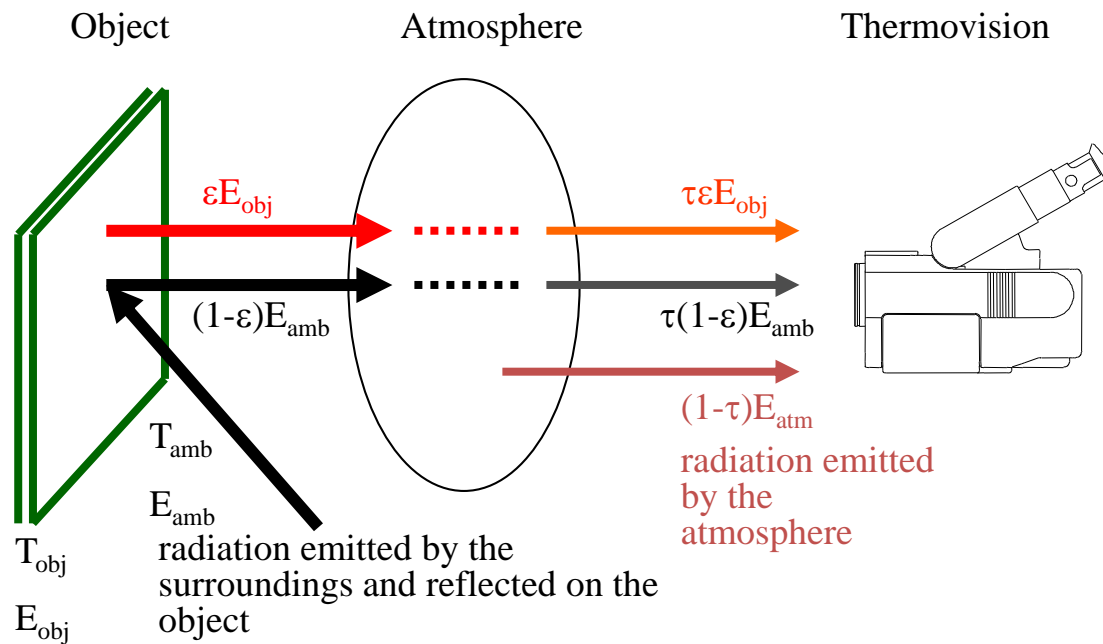
**Research Area:** Thermal Engineering, Environment Control

Tel: 886-5-271-7656, E-mail: jllin@mail.ncyu.edu.tw



## Research Interests:

1. Thermal Imaging Application
2. Environment Control Engineering







洪滉祐 教授 Professor **Huaang-Youh Hurng, Ph.D.**

**Research Area:**

Sonic NDT, Physical Analysis, Drying and Cooling Storage

Tel: 886-5-271-7651, E-mail: hungyu@mail.ncyu.edu.tw

**Research Interests :**

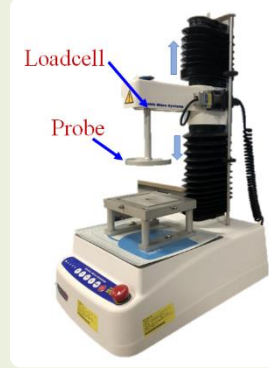
- 1. Agricultural Machinery Engineering**
- 2. Post-harvest Engineering**
- 3. Non-destructive Detection Technology**



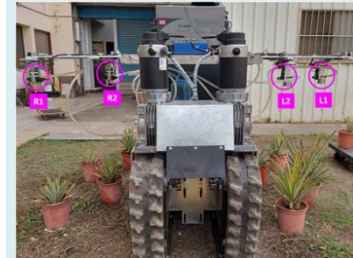
**Pineapple Sorting Harvester**



**Cold Pressing Technology**



**Texture Analyser**



**Agricultural Robot**



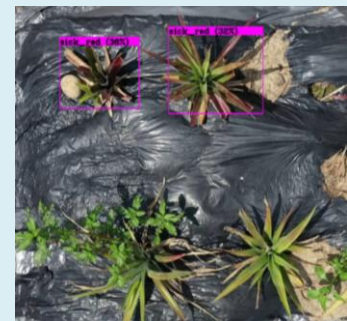
**Double-Layer Collection and Transportation Platform**



**Camellia Oil**



**Applications**



**Growth Vigor Discrimination**



邱永川 教授 **Professor Yung-Chuan Chiou, Ph.D**

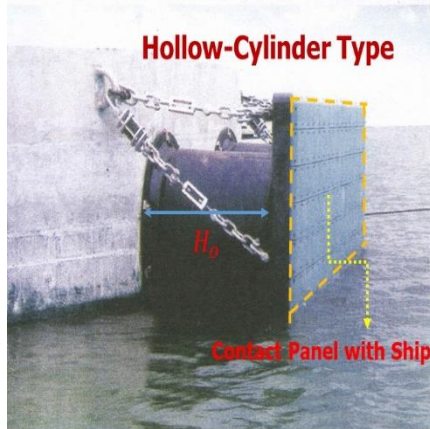
**Research Area:** Solid Mechanics, Metal Fatigue Test

Tel: 886-5-271-7667, E-mail: solas@mail.ncyu.edu.tw



## Research Interests:

1. **Plastic Mechanic and Fatigue Analysis.**
2. **Rubber Buckling Behavior and Rubber Fenders.**







洪敏勝 教授 Professor **Min-Sheng Hung**, Ph.D.

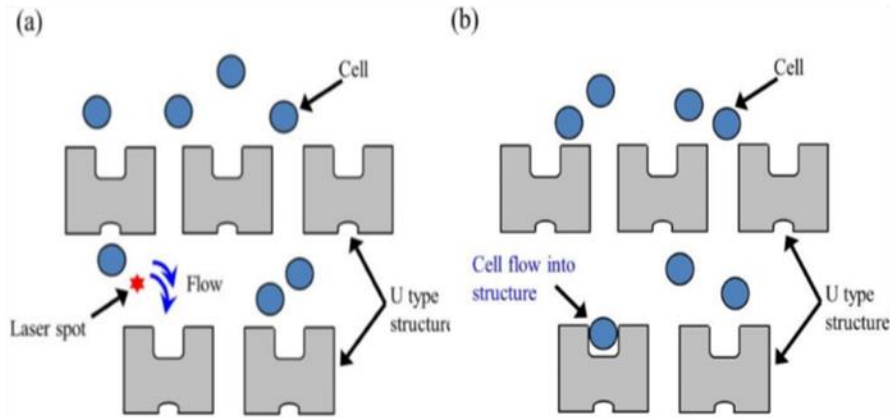
**Research Area:** Biomedical Micro-Thermal-Fluidics Technology

Tel: 886-5-271-7674, E-mail: mshung@mail.ncyu.edu.tw



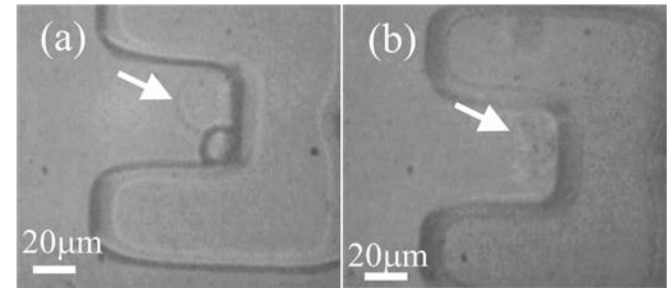
### Research Interests:

- Bio-manipulation Engineering**
- Micro Thermal Fluidics Systems**

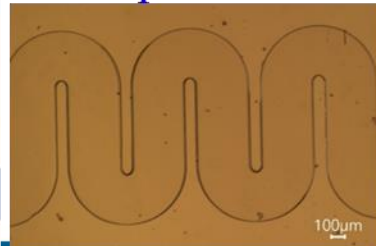
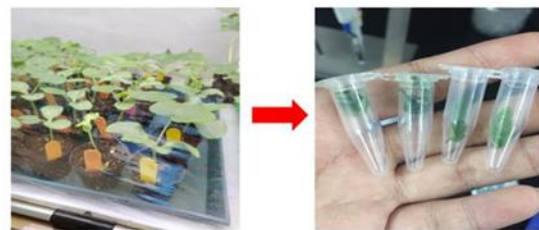


cell capture

cell lysis

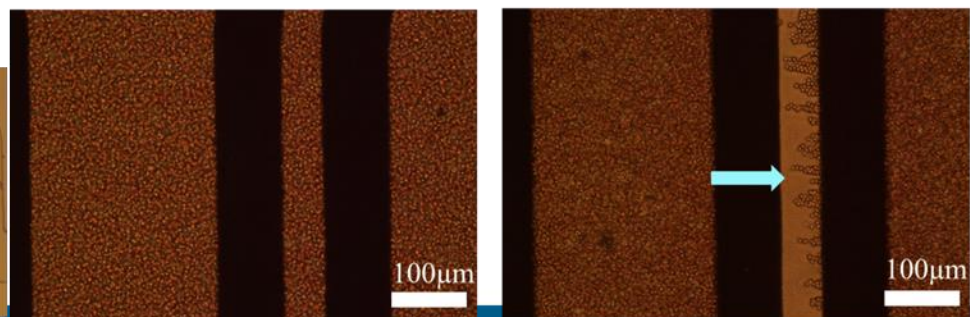


### Microfluidics for cell capture



Before DEP

After DEP





連振昌 教授 Professor **Ceng-Chang Lien, PhD**

**Research Area:** NDT, Livestock Machinery

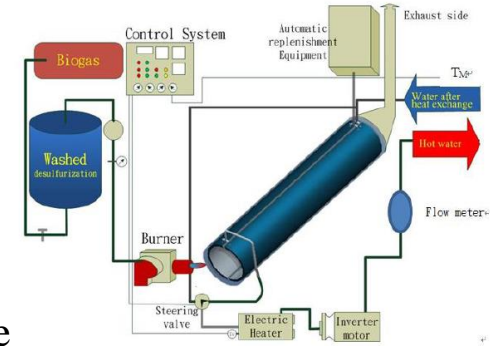
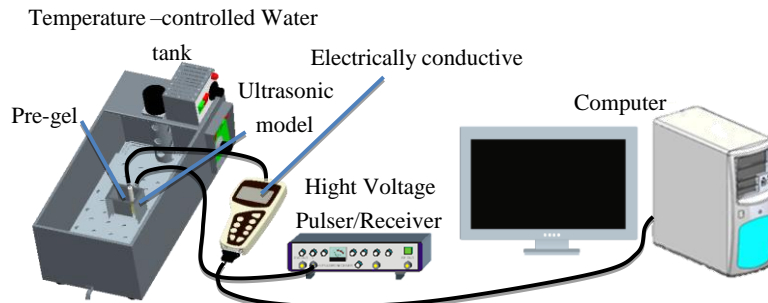
Tel: 886-5-271-7972, E-mail: lanjc@mail.ncyu.edu.tw



### Research Interests:

**1. Livestock machinery , 2. Non-destructive testing of agricultural products , 3.**

### Agricultural facility



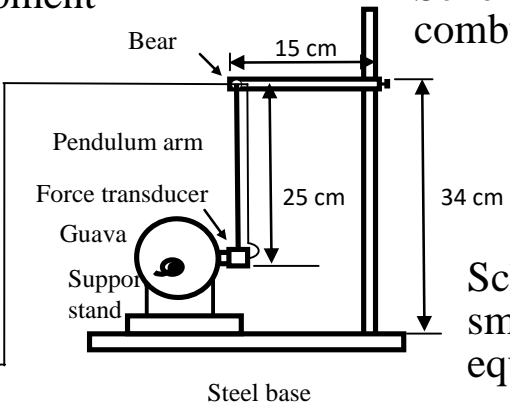
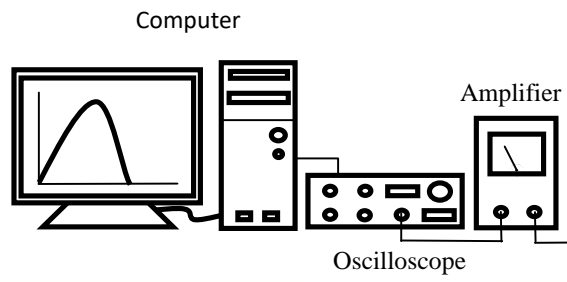
Online lead detection system  
Schematic diagram of

Schematic diagram of ultrasonic testing module equipment

Schematic diagram of biogas combustion hot water system



Biogas water scrubbing sulphur equipment  
of for stitis



Schematic diagram of the small mass impact test equipment





朱健松 教授 Professor **Jain-Song Ju**, PhD.

**Research Area:** Horticulture Machinery, Mechatronics

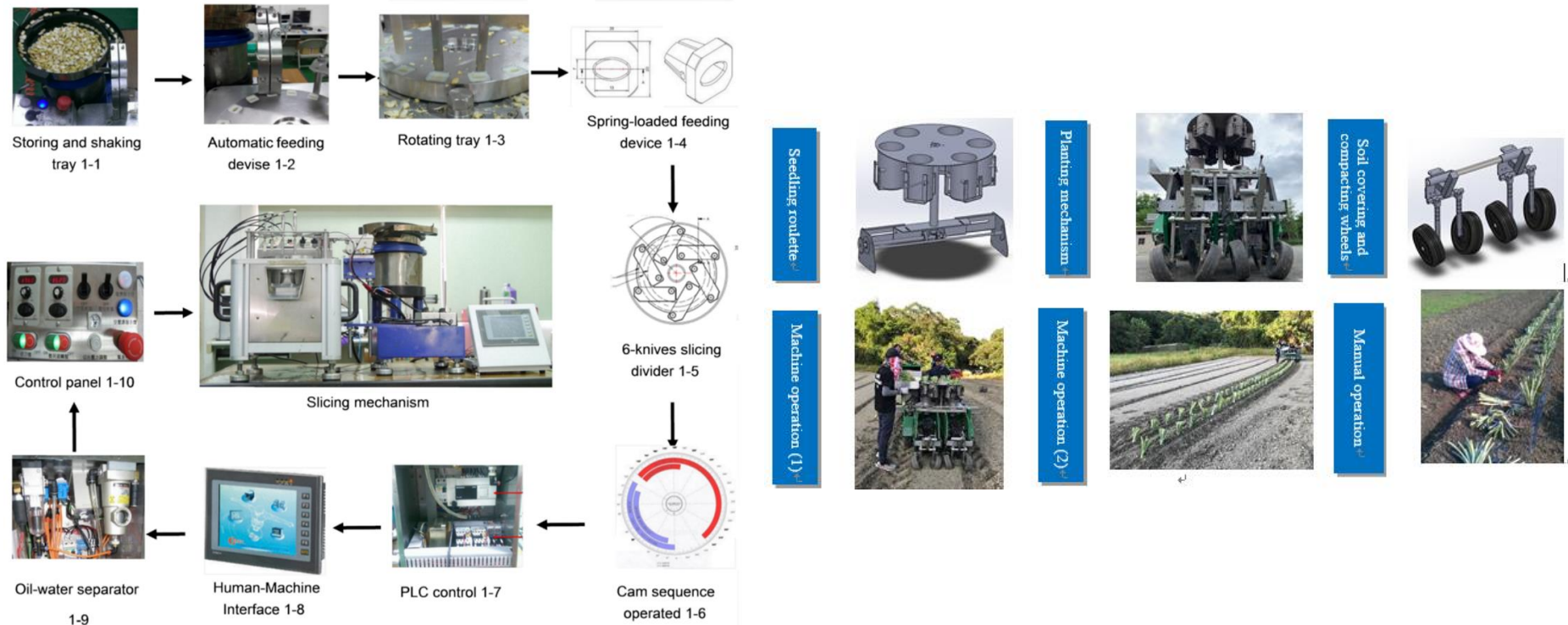
Tel: 886-5-271-7665, E-mail: jainsong@mail.ncyu.edu.tw



## Research Interests:

### 1. Food Engineering

### 2. Agricultural Machinery Engineering



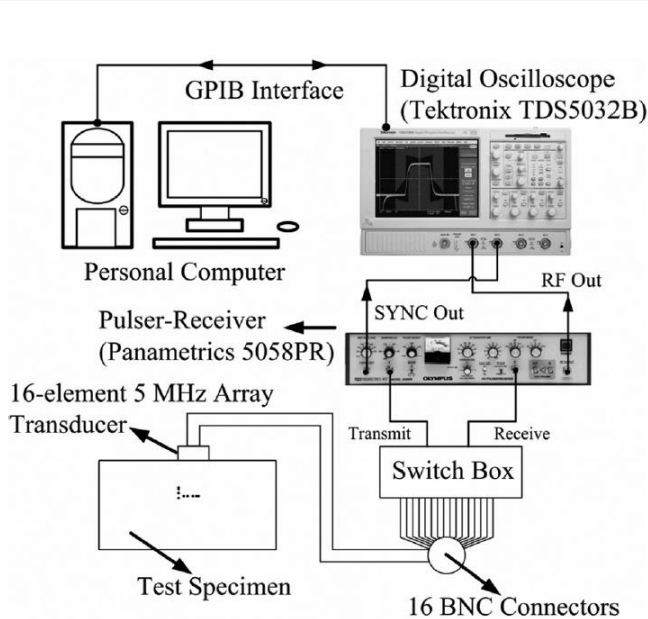
張智雄 教授 Professor **Chih-Hsiung Chang**, Ph.D

**Research Area:** Elastic Wave Theory, Ultrasonic Image

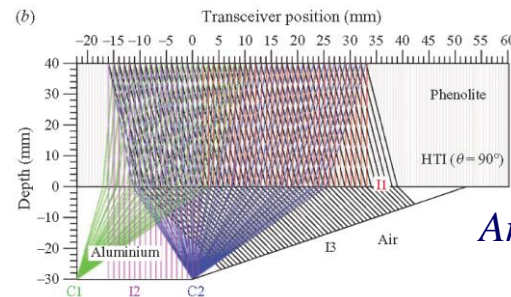
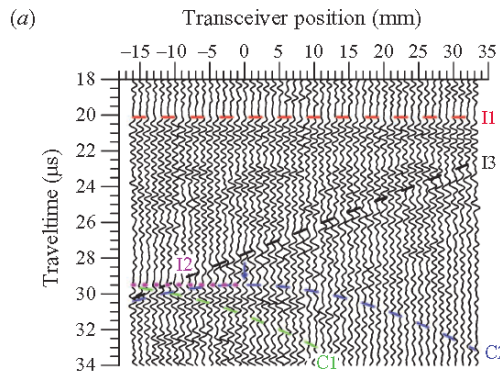
Tel: 886-5-271-7327, E-mail: charles@mail.ncyu.edu.tw

**Research Interests:**

Forward Modeling Study  
Anisotropy Evaluation



Schematic diagram of an ultrasonic TFM array system.



Anisotropic Image  
Reconstruction





洪昇利 副教授 Associate Professor, **S. L. Hong, Ph.D**

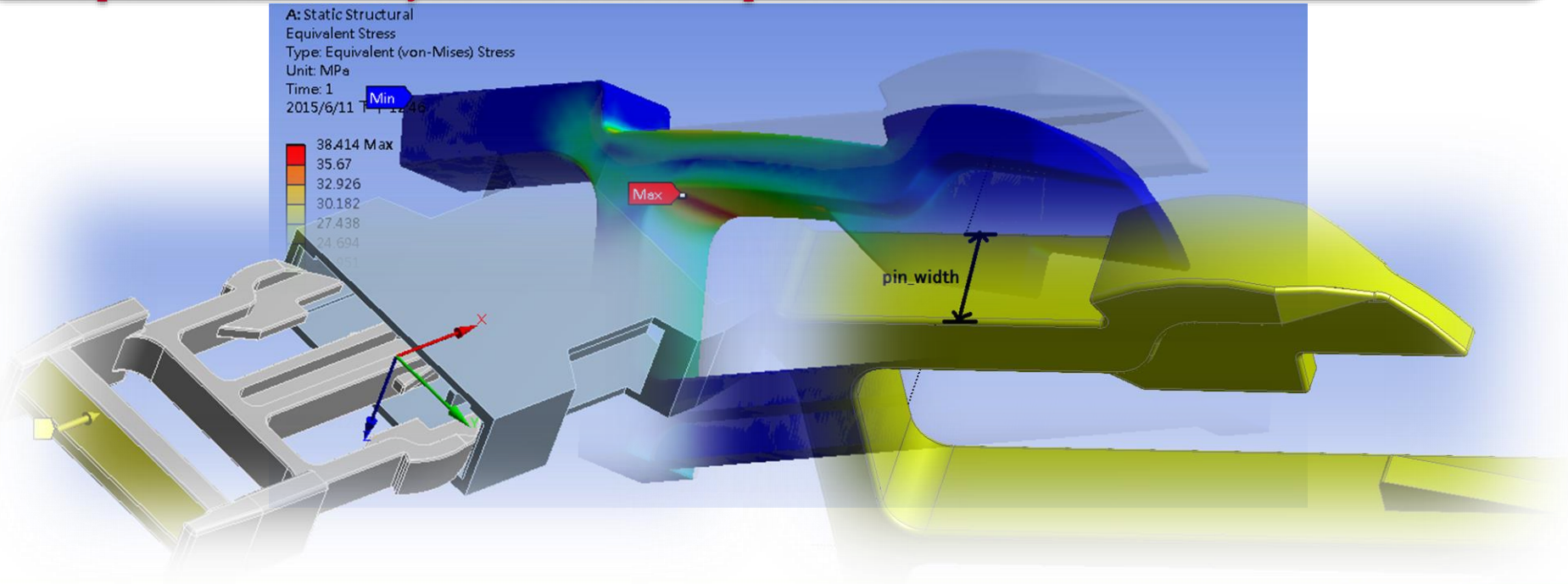
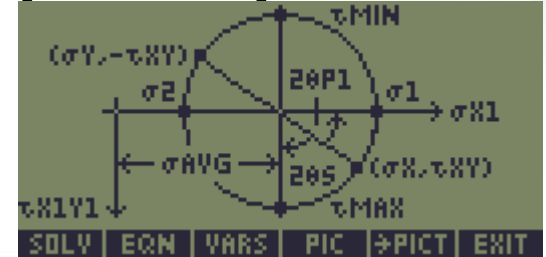
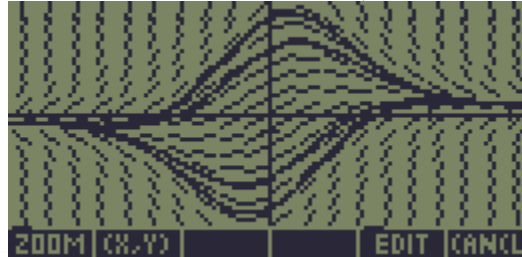
**Research Area:** Finite Element Analysis, CAD/CAM

Tel: [886-5-271-7652](tel:886-5-271-7652), E-mail: [sunny@mail.ncyu.edu.tw](mailto:sunny@mail.ncyu.edu.tw)



### Research Interests:

1. Applications with Engineering Graphical Calculator HP 48
2. Optimization Analysis of Plastic Snap-fit Buckle





沈德欽 副教授 Associate Professor **DC Tseng**

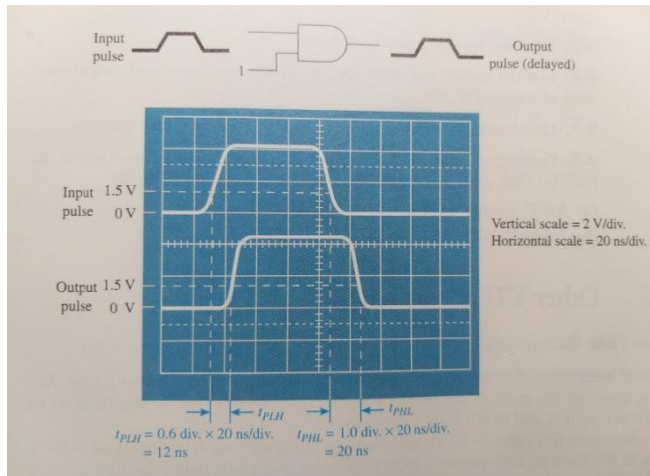
**Research Area:** Logic Design

**Tel:** 886-5-271-7656 **E-mail:** sdchin@mail.ncyu.edu.tw



## Research Interests:

1. Digital Electronics Signals
2. Control of microprocessor system





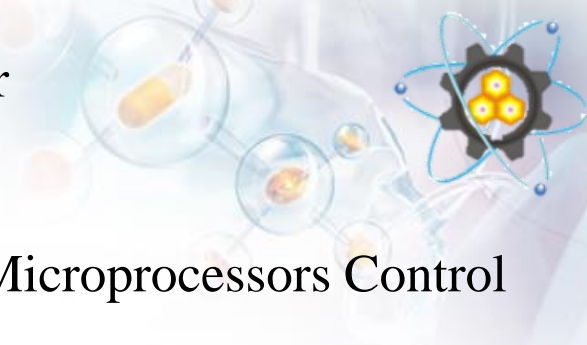


楊朝旺 副教授 Associate Professor

Chao-Wang Young, Ph.D

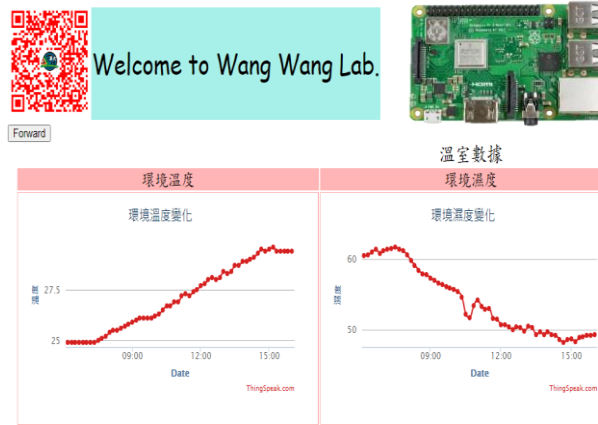
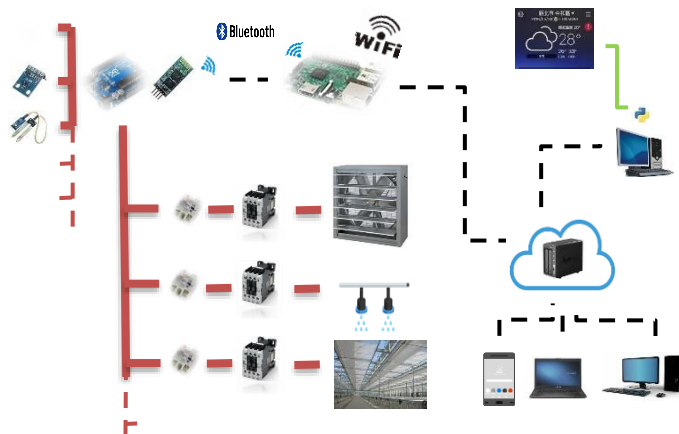
Research Area: Electronic Circuits, Microprocessors Control

Tel: 886-5-271-7679, E-mail: youngcw@mail.ncyu.edu.tw



## Research Interests:

1. Microprocessors application
2. CPLD digital circuit design
3. Principles and applications of sensors

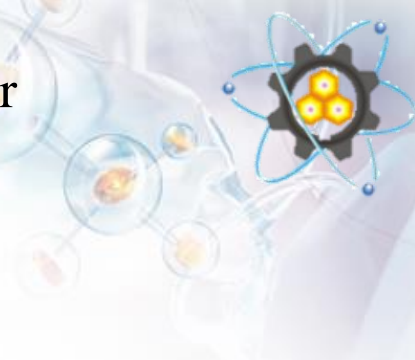


黃文祿 助理教授 Assistant Professor

Wen-Luh Huang, Ph.D

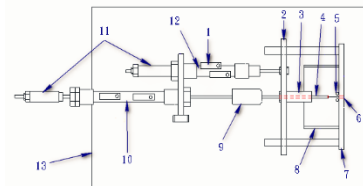
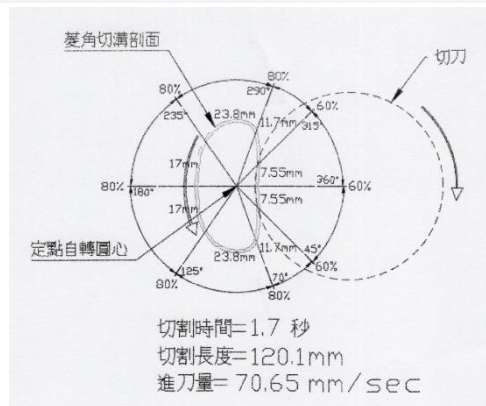
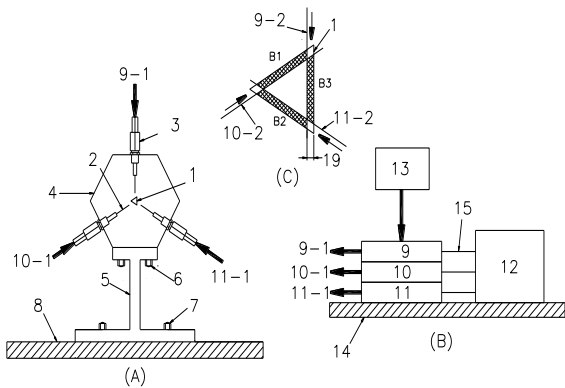
Research Area: Bio-industrial Machinery

Tel: 886-5-271-7974, E-mail: wlh@mail.ncyu.edu.tw



### Research Interests:

1. Bio-industry machinery
2. PLC and electromechanical integration control applications
3. Food machinery and engineering
4. Flight principle and controlling application of Unmanned Aerial Vehicle(UAV)



Semi-automatic machine of removing plumule for Lotus seeds

Cutting and Shelling Machine for Water Chestnut

controlling application of Unmanned Aerial Vehicle(UAV)



shelling grass device for wet Lin grass





黃膺任 助理教授 Assistant Professor

Ying-Jen Huang, Ph.D

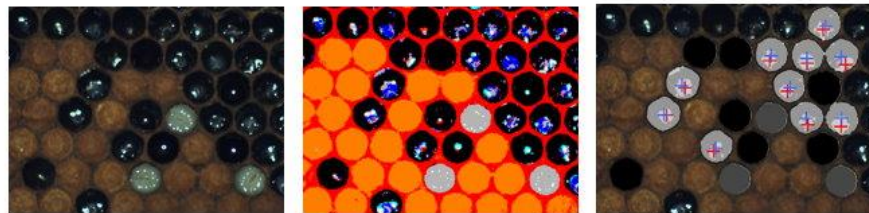
Research Area: Image Processing, Computer Vision

Tel: 886-5-271-7666, E-mail: jen@mail.ncyu.edu.tw



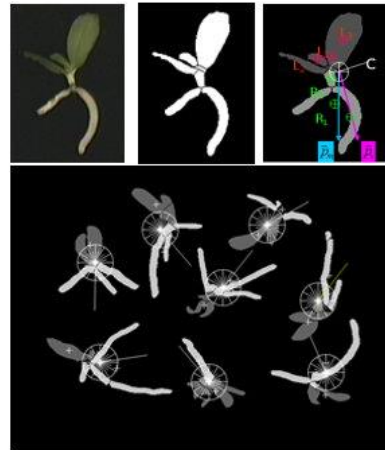
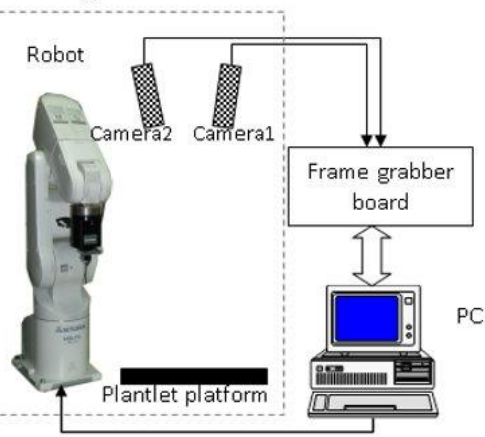
### Research Interests:

- Machine Vision
- Image Positioning
- Deep Learning

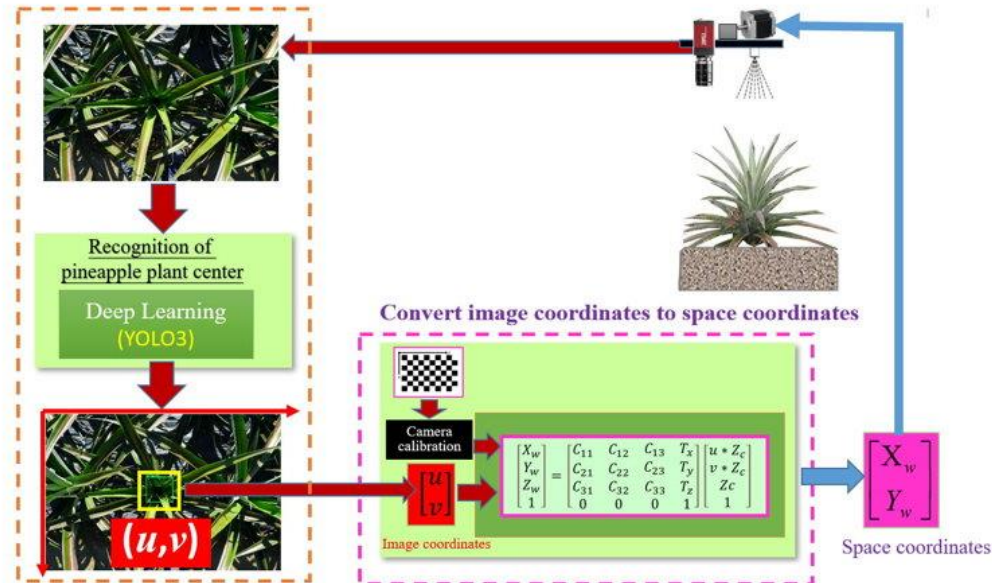


Light chamber

Automatic Removing Larvae for Royal Jelly Product



### Recognition and Positioning of Pineapple Plant Center





吳德輝 助理教授 Assistant Professor

Te-Hui Wu, Ph.D

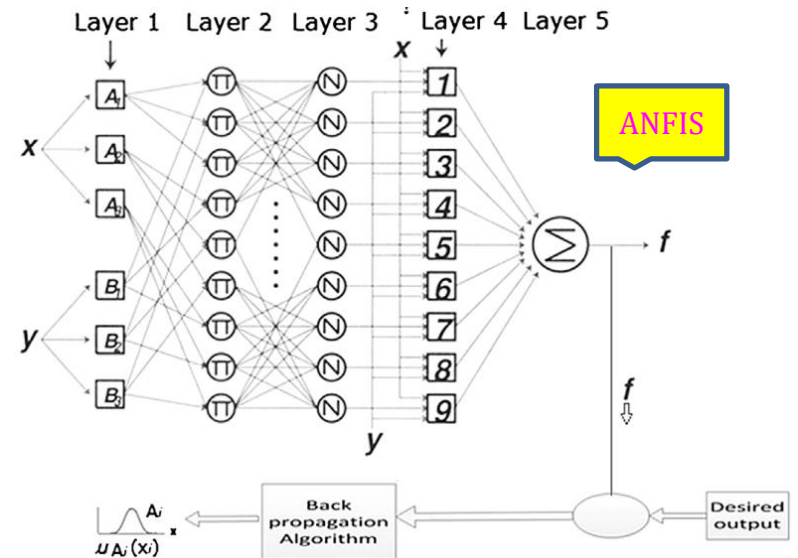
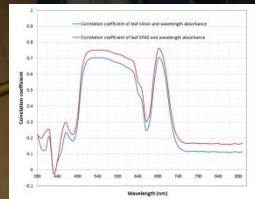
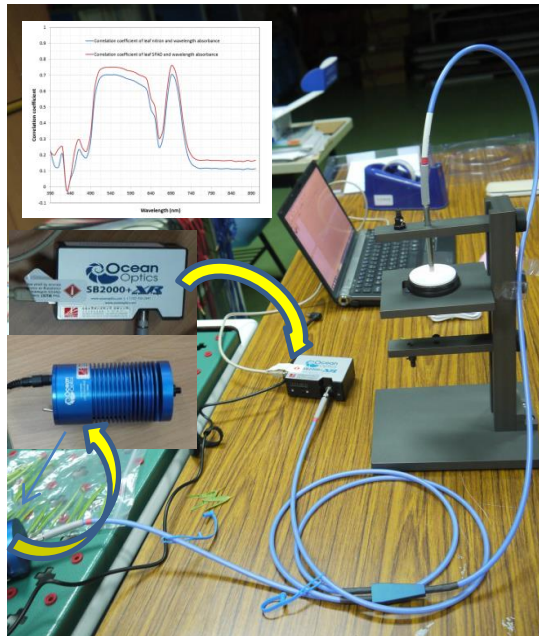
Research Area: NIR Engineering, Remote Sensing

Tel: 886-5-271-7973, E-mail: tehuiw@mail.ncyu.edu.tw



## Research Interests:

1. Remote Sensing
2. Modeling of Fuzzy Systems



Equivalent ANFIS architecture!





黃威仁 助理教授 Assistant Professor

Wei-Jen Huang, Ph.D

Research Area: Bio-industrial Machinery, IoT

Tel: 886-5-271-7606, E-mail: wjhuang@mail.ncyu.edu.tw

## Research Interests:

1. Agricultural IoT Systems
2. Agricultural System Development

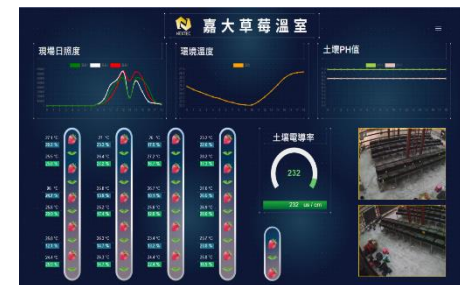
### Monitor the top floor v.s atrium



IoT Monitor System of plant growth



Plant growth with IoT sensors



Strawberry greenhouse IoT systems

# Selected Publications



- [Min-Sheng Hung\\*](#) and Ying-Ting Shih. DNA replication of single cell using laser heating in varied osmotic solutions. *Microscopy and Microanalysis*. **2020**, 26, Supplement S2, 302-303.
- [Min-Sheng Hung\\*](#) and Chih-Pin Chen. Laser-induced heating for in situ DNA replication and detection in microchannels. *IET Nanobiotechnology*. **2018**, 12, 841 – 845 .
- [Yung-Chuan Chiou\\*](#). Effect of Wall Thickness on Stress–Strain Response and Buckling Behavior of Hollow-Cylinder Rubber Fenders. *Materials*, **2020**, 13, 1170-1191.
- [Yung-Chuan Chiou\\*](#). Effects of adding graphene nanoplatelets and nanocarbon aerogels to epoxy resins and their carbon fiber composites. *Materials and Design*. **2019**, 178, 107689.
- Ying-Jen Huang, [Cheng-Chang Lien\\*](#), Jun-Han Mei. Study on Warming Piglet in Hog Farm by Combustion Heat Energy of Biogas. *Journal of Clean Energy Technologies*. **2018**, 6, 357-360.
- [Chih-Hsiung Chang\\*](#). Behaviors of Converted Wave in an Azimuthally Isotropic Medium - A Physical Model Study. *Earth Science*. **2019**, 8, 228-234.
- [Chih-Hsiung Chang\\*](#), Young-Fo Chang and Po-Yen Tseng. Azimuthal Variation of Converted-Wave Amplitude in a Reservoir with Vertically Aligned Fractures - A Physical Model Study. *Geophysical Prospecting*. **2016**, 65, 221-228.
- [Jain-Song Ju\\*](#). Commercialized machine for soaking and slicing peanuts to induce resveratrol production. *Journal of Food Process Engineering*. **2018**, 41, 1-11 .
- [Jain-Song Ju\\*](#). New automated peanut kernel slicing machine for enhanced stilbenoid production. *Journal of the Chinese Institute of Engineers*, **2018**, 41, 557-565.
- Chia-Hsin Liu, [Chyung Ay](#), Chun-Yu Tsai and Maw-Tien Lee. The Application of Passive Radiative Cooling in Greenhouse. *Sustainability*, **2019**, 11, 6703.
- Chia-Hsin Liu, [Chyung Ay](#), Jo-Chuan Kan and Maw-Tien Lee. The Effect of Radiative Cooling on Reducing the Temperature of Greenhouses. *Materials*, **2018**, 1166.





Engineering Building



Mechatronics Hall



College of Science & Engineering

***WELCOME to NCYU!!***

