Kuan-Hsun Huang
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Education

09.2021 - Now **Master's and PhD in Engineering Science (In school)**
Taiwan National Cheng Kung University
- **Professional fields:** Automation, Image Recognition, Biomedical Chips, Mechatronic Integration

09.2017 - 06.2021 **Bachelor's in Biomechatronic Engineering**
Taiwan National Pingtung Science and Technology University
- **Professional fields:** Image Recognition, Biomedical Chips, Mechatronic Integration
- **Thesis:** Rapid DNA Detection Applications: Microsystems Combined with Image Analysis

Research Assistant

September 2021 - Present Research Assistant, Microfluidic Biochip Lab, National Cheng Kung University. Advisor: Prof. Lung-Ming Fu
- Designed and planned experiments to achieve research objectives, conducted hands-on experiments, analyzed data to identify problems, and proposed effective solutions.
- Assisted the laboratory in developing the microfluidic biomedical paper-based chip detection box, combined with an image recognition development system and an analysis system construction.
- Assisted the Ministry of Science and Technology project on rapid microfluidic spectroscopy and amplification detection system in executing related experiments and instrument development.
- Managed laboratory instruments to ensure normal operation.

September 2022 - Present Research Assistant, Automated Optical Lab, National Pingtung Science and Technology University's Biomechatronic Engineering Department. Advisor: Prof. Li Wen-Tsung
- Algorithm design and development were carried out for fabric texture to achieve automated defect detection, effectively replacing traditional manual inspection.
- Responsible for testing and validating image recognition models, and adjusting parameters for different materials and light sources.
- We transform academic theories into practical solutions to help partner companies overcome technical bottlenecks in production line defect detection.

Skills

- **Microfluidics & Biosensing:** Paper-based assays, Chip-based, Optic readout
- **Fabrication:** CO_2 laser micromachining, Detection box process design

- **Software & Prototyping:** SolidWorks, Arduino, ImageJ, Python

Publication

Journal

1. Chen, S. J., Tseng, C. C., Kuan-Hsun Huang, Chang, Y. C., & Fu, L. M. (2022). Microfluidic sliding paper-based device for point-of-care determination of albumin-to-creatine ratio in human urine. Biosensors, 12(7), 496. (SCI; IF = 5.4, Ranking = 14/86, 16.2%)
2. Ko, C. H., Liu, C. C., Kuan-Hsun Huang, & Fu, L. M. (2023). Finger pump microfluidic detection system for methylparaben detection in foods. Food Chemistry, 407, 135118. (SCI; IF = 8.8, Ranking = 5/88, 5.6%)
3. Lu, S. Y., Liu, C. C., **Kuan-Hsun Huang**, Yu, C. X., & Fu, L. M. (2023). Microfluidic Distillation System for Separation of Propionic Acid in Foods. Micromachines, 14(6), 1133. (SCI; IF = 29/86, Ranking = 29/86, 33.7%)
4. Lu, S. Y., Tseng, C. C., Yu, C. X., Chen, T. L., **Kuan-Hsun Huang**, Fu, L. M., & Wu, P. H. (2024). Rapid microfluidic fluorescence detection platform for determination of whole blood sodium. Sensors and Actuators B: Chemical, 400, 134839. (SCI; IF = 8.4, Ranking = 1/63, 1.5%)
5. Chen, S. J., Lu, S. Y., Tseng, C. C., **Kuan-Hsun Huang**, Chen, T. L., & Fu, L. M. (2024). Rapid Microfluidic Immuno-Biosensor Detection System for the Point-of-Care Determination of High-Sensitivity Urinary C-Reactive Protein. Biosensors, 14(6), 283. (SCI; IF = 5.4, Ranking = 14/86, 16.2%)
6. Yu, C. X., **Kuan-Hsun Huang**, Chen, T. L., Liu, C. C., & Fu, L. M. (2024). Microfluidic Detection Platform for Determination of Ractopamine in Food. Biosensors, 14(10), 462. (SCI; IF = 5.6, Ranking = 9/79, 13.4%)
7. **Kuan-Hsun Huang**, Yu, C. X., Lee, C. C., Tseng, C. C., & Fu, L. M. (2025). Rapid Microfluidic Ion-Exchange Optode System for Point-of-Care Determination of Sodium Concentration in Serum. Biosensors, 15(2), 104. (SCI; IF = 5.6, Ranking = 9/79, 13.4%)
8. Liu, C. C., Chen, T. L., Wang, H. M., **Kuan-Hsun Huang**, & Fu, L. M. (2025). Simultaneous quantification of fructose and sucrose in beverages using microfluidic paper chip and colorimetric pixel-area analysis method. Food Chemistry, 146702. (SCI; IF =9.8, Ranking = 4/113, 3.5%)
9. Yu, C. X., Chang, C. C., **Kuan-Hsun Huang**, & Fu, L. M. (2025). Electrokinetic Microfluidics at the Convergence Frontier: From Charge-Driven Transport to Intelligent Chemical Systems. Micromachines, 17(1), 71. (SCI; IF =3.0, Ranking = 49/111, 44.1%)
10. **Kuan-Hsun Huang**, Tseng, C. C., Lee, C. C., Yu, C. X., & Fu, L. M. (2026). Rapid Finger-Pump Microfluidic Paper-Based Assay Platform for Monitoring Calcium Ions in Human Biofluids. Biosensors, 16(4), 183. (SCI; IF = 5.6, Ranking = 9/79, 13.4%)
11. Lee, C. C., Lu, S. Y., Yu, C. X., Tseng, C. C., **Kuan-Hsun Huang**, & Fu, L. M. (2026). Electrochemical biosensor microchip platform for rapid whole-blood chloride ions quantification in CKD point-of-care monitoring. Talanta, 302, 129320. (SCI; IF = 6.1, Ranking = 8/111, 7.2%)

Conference

1. **Kuan-Hsun Huang,** Szu-Jui Chen and Lung-Ming Fu, (2022). A rapid micro-spectrometer platform for detection of Blood Urea Nitrogen in Serum, *International Conference on Precision Nanomedicine*

in Theranostics and The 2022 Annual Meeting of Taiwan Nanomedicine Society,TNSC. Hsinchu, Taiwan.

2. Szu-Jui Chen, **Kuan-Hsun Huang** and Lung-Ming Fu, (2022). Integrated microfluidic paper-based system for determination of human urine albumin, *International Conference on Precision Nanomedicine in Theranostics and The 2022 Annual Meeting of Taiwan Nanomedicine Society, TNSC.* Hsinchu, Taiwan.
3. Chien-Hsuan Ko, **Kuan-Hsun Huang** and Lung-Ming Fu, (2022). Rapid electrochemical-biosensor paper-based chip platform for detection of albuminuria in kidney disease patients, *International Conference on Precision Nanomedicine in Theranostics and The 2022 Annual Meeting of Taiwan Nanomedicine Society, TNSC.* Hsinchu, Taiwan.
4. Song-Yu Lu, **Kuan-Hsun Huang**, and Lung-Ming Fu, (2022). Microfluidic apt-sensor POC device for determination of whole blood potassium. *International Conference on Precision Nanomedicine in Theranostics and The 2022 Annual Meeting of Taiwan Nanomedicine Society, TNSC.* Hsinchu, Taiwan.
5. Chien-Hsuan Ko, **Kuan-Hsun Huang** and Lung-Ming Fu, (2022). Rapid detection of saccharin sodium and acesulfame potassium in food using paper-based chromatography detection system. *International Conference on Smart Sensors, ICSS, Taichung,* Taiwan.
6. Szu-Jui Chen, **Kuan-Hsun Huang** and Lung-Ming Fu, (2022). Integrated microfluidic paper-based smart analysis system for determination of human urine creatinine. *International Conference on Smart Sensors, ICSS, Taichung,* Taiwan.
7. Song-Yu Lu, **Kuan-Hsun Huang** and Lung-Ming Fu, (2022). Rapid microfluidic paper-based analysis detection system for sodium dehydroacetatein foods. *International Conference on Smart Sensors, ICSS, Taichung,* Taiwan.
8. Chien-Hsuan Ko, **Kuan-Hsun Huang** and Lung-Ming Fu, (2023). A novel microfluidic biosensor for the determination of Matrix Metalloproteinase-2 in kidney disease patients. *The 2023 Annual Meeting of Taiwan Nanomedicine Society,TNSC. Hsinchu, Taiwan.*
9. **Kuan-Hsun Huang** and Lung-Ming Fu, (2023). Microfluidic paper-based chip system combined with silver nanoparticles for heavy metal mercury ion detection in food. *International Conference on Smart Sensors, ICSS, Tainan,* Taiwan.

Professional Licence

● Organic Solvents Operations Supervisor	**Certificate Number: 110S02135030114**
● Specific chemical operations supervisor	**Certificate Number: 110S02133040101**
● MTA Python	**Exam Reference Number: 39478173**
● Sustainable Carbon Management Analyst - Level C	**Certificate Number: TIEA-SDCMA-11201808**
● Sustainable Carbon Management Analyst - Level B	**Certificate Number: TIEA-SDCMP-11202030**

Award

- 2021 The 1st Smart Agriculture Digital Twin Innovative Application Competition — **Selected for the final**
- 2021 The 5th National Compassion Technology Innovation Competition — **Selected for the final**
- 2023 Ministry of Education (MOE) Precision Health Industry Innovation and Entrepreneurship Competition — **Honorable Mention**
- "Medical Innovation" Precision Health Demo Day National Innovation and Creativity Competition — **Honorable Mention**
- 2024 Recommended Outstanding Talent, Cross-disciplinary Talent Cultivation Program for Precision Health Industry — **Awarded Outstanding Team**
- 2024 National Science Council Future Science and Technology Award — **Future Tech Award**

Certificate of Appointment

- 2021 Pingtung University of Science and Technology Table Tennis Promotion Club — **Instructor**
- 2022 Pingtung University of Science and Technology Table Tennis Promotion Club — **Instructor**

Scholarship

- 2022 Lee Chang Jung Education Foundation Scholarship (First Prize)
- 2022 National Science Council Scholarship for Outstanding Doctoral Candidates
- 2022 Lee Chin Industrial Taiwan-Vietnam Elite Talent Scholarship
- 2022 Ministry of Education Industry-Academia Collaboration Doctoral and R&D Talent Cultivation Program Scholarship
- 2024 AU Optronics Elite R&D Talent Scholarship
- 2025 National Cheng Kung University College of Engineering Yuan Fu-Kuo Scholarship
- 2025 Subsidy for Domestic Graduate Students Attending International Academic Conferences