



System integration / Image processing / Embedded system

DISSERTATION

- Development of an Optical Zoom Uncooled Thermal Imaging System for Environmental Observation Doctoral Dissertation
 - The integration is composed of hardware devices including industrial computers, thermal image sensors, zoom lenses, GPIO control modules, and power circuit boards.
 - By employing image processing techniques such as NUC (Non-Uniformity Correction), DPC (Defect Pixel Correction), and IE (Image Enhancement), the raw data is converted into visual images that can be observed.
 - The system is written in Python, with some of its content using OpenCV.
- Development of Compact Immunoassay System for Helicobacter Pylori Detection Master's Thesis
 - The integration is composed of hardware devices including Raspberry Pi, CMOS camera, LED light source-equipped circuit board, Liquid Crystal Display, Real-Time Clock, light diffuser plate, and an enclosed chamber equipped with a fixed light source for controlled illumination.
 - Using the Taguchi quality method to analyze and improve the accuracy of detection results.
 - The system is written in Python and primarily using OpenCV and SQL.

PATENT

- I752684 INTEGRATED CARRIER FOR RAPID TEST KITS 快篩試劑整合載台 2020 Oct.
- M610229 DEVICE FOR READING RAPID TEST 快篩試劑判讀儀 2020 Oct.
- M606957 DEVICE FOR READING RAPID TEST 快篩試劑判讀儀 2020 Oct.
- I734413 STRIP DETECTING APPARATUS 試片檢測設備 2020 Mar.

REFEREED JOURNAL PAPER

1. Lin, K.-W., & Chang, Y.-C. (2021). Embedded immunodetection system for fecal occult blood. *Biosensors*, 11(4), 106.
2. Lin, K.-W., Wang, T.-Y., & Chang, Y.-C. (2021). Impact of top electrodes on the nonvolatile resistive switching properties of citrus thin films. *Polymers*, 13(5), 710.
3. Lin, K.-W., & Chang, Y.-C. (2021). Use of the taguchi method to optimize an immunodetection system for quantitative analysis of a rapid test. *Diagnostics*, 11(7), 1179.

REFEREED CONFERENCE PAPER

1. Lin, K.-W. & Hou, T.-W. (2016, August). With a controllable mobile apparatus rapid test detection system (in Chinese). In *Proceedings of the 20st Nano Engineering and Microsystem Technology Conference*, Hsinchu, Taiwan.
2. Lin, K.-W., Weng, W.-C. & Lai, C.-F. (2019, June). Development of Immunoassay System for Helicobacter Pylori Detection (in Chinese). In *Proceedings of the International Conference on Smart Sensors 2019*, Hsinchu, Taiwan.
3. Lin, K.-W. (2019, August). Development of Compact Immunoassay System for Helicobacter Pylori Detection (Unpublished master's thesis). National Cheng Kung University, Taiwan.
4. Lin, K.-W. & Chang, Y.-C. (2020, October). Immunodetection System for Fecal Occult Blood Rapid Test. In *Proceedings of the IEEE 6th International Conference on Applied System Innovation 2020*, Taitung, Taiwan.
5. Lin, K.-W. & Chang, Y.-C. (2021, September). Using the Taguchi Method to Optimize Immunodetection System for Quantitative Analysis of Rapid Test. In *Proceedings of the IEEE 7th International Conference on Applied System Innovation 2021*, Chiayi, Taiwan.
6. Lin, K.-W. & Chang, Y.-C. (2023, April). Development of An Optical Zoom Uncooled Thermal Imaging System for Environmental Observation. In *Proceedings of the IEEE 9th International Conference on Applied System Innovation 2023*, Chiba, Japan.

EXPERIENCE

- Bio Asia Taiwan 亞洲生技大展 – Exhibitor 2020 Jul.
 - 於展覽中展示新型螢光快篩檢測原型機.
 - 作為新創公司參與此次生技展.
- 第十一屆「國研盃i-ONE儀器科技創新獎」 – Competition Team 2019 Oct.
 - 以 "智慧行動裝置雲端快速居家健檢系統" 入圍初選.
 - 專案軟體開發主要成員之一.
- MEDICAL FAIR THAILAND 泰國曼谷國際醫療器材展 – Exhibitor 2019 Sep.
 - 為世延生醫以及尖端醫開發新型專用檢測設備.
- ECPFA 亞洲工學院策略聯盟會議 – Engineering Student Representatives 2019 Aug.
 - 作為工學院代表與來自各國工學院的頂尖學生以議題 "Clean Energy, Clean City" 進行交流.
 - 獲得此活動論文最佳簡報獎項.
- Bio Asia Taiwan 亞洲生技大展 – Exhibitor 2019 Jul.
 - 於展覽中展示新型簡易型快篩檢測原型機.
 - 協助大陸廠商 Genesis 以及美國廠商 Vicam 開發新型專用檢測設備.
- 經濟部 - 科研成果價值創造計畫 – Participating Team 2018 Dec.
 - 完成兩型原型機軟體各項開發.
 - 以檢測設備技術申請兩項專利.
- 成功大學技轉育成中心 - 成功大學創新創業Startup Festival年度成果發表會 – Publication Team 2018 Nov.
 - 完成專案原型機開發, 並在發表會上展示.
 - 參與原型機硬體外觀設計以及電路設計, 並獨力完成軟體開發.
- Bio Taiwan 台灣生技月-台灣生物科技大展 – Exhibitor 2018 Jul.
 - 於展覽中展示三台已開發用於不同功能的免疫分析儀原型機.
 - 參與原型機的硬體及電路設計, 並獨力完成部分機台軟體開發.
- 成功大學技轉育成中心 – 成大創新圓夢計畫 "Dreams Come True。原型打出" – Participating Team 2018 Jun.
 - 參與設計專案, 並以此獲得新創計劃補助.
- 第九屆「國研盃i-ONE儀器科技創新獎」 – Competition Team 2017 Oct.
 - 以 "智慧行動裝置快篩檢測設備" 獲得佳作.
 - 參與原型機的硬體及電路設計, 並且為軟體主要開發人員之一.
- International conference "Transducers 2017" – Staff Member 2017 Jun.
 - 協助會議的舉行、場地布置、人員引導、問題協助、協助溝通、幕後工作、事前準備等工作.

SKILLS

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|----------|-------------------|--------------|---------|
| • Python | • Linux | • SolidWorks | • Ansys |
| • MATLAB | • Taguchi Methods | • AutoCAD | • SPSS |