



The Applications of Machine Vision in Agriculture – The Current Status in Taiwan

Abstract

Food security is always one of the top priorities globally. As estimated by the United Nations, the global population will reach 9.7 billion in 2050. However, food production is facing issues of labor shortage and workforce aging. Nowadays, few in the young generation are willing to work in agriculture because of the harsh working environments and disproportionate wages. Conventional, the observation of farming or animal conditions relies on manual observation. This is because the environments for crops and animal husbandry are usually complex. However, manual observation is slow and labor-intensive. To solve this problem, machine vision is applied for managing farms. This speech introduces the current status of the machine vision applications to agriculture, aquaculture, and animal husbandry in Taiwan. Several examples of the applications are given in the speech.



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RESEARCH AREAS AND EXPERTISE

- General area: Agricultural Automation
- Specific area: Machine Vision for Automation

AWARDS AND RECOGNITION

- Associate Editor, Journal of the ASABE, 2022-
- Outstanding Teaching Award, National Taiwan University, 2015 and 2022
- First Place, 2021 CTCI Foundation AI Innovation Competition, 2021
- Associate Editor, Computers and Electronics in Agriculture, 2021-2022
- Invited Participant, Next Generation Leaders Event, CIGR, 2019

Yan-Fu Kuo is a Professor in the Department of Biomechatronics Engineering at National Taiwan University (NTU). He received his Bachelor degree in Agriculture Machinery Engineering at NTU, and Master's and Ph.D. degrees in Mechanical Engineering at Purdue University, U.S.A. After graduation from Purdue University, he became an Assistant Professor at NTU in 2011. His research interests include machine vision and automation in agriculture. Some of his current research topics include crop disease and pest identification using smart phones, wood species recognition using smart phones, shrimp length measurement using underwater system, and behavior monitoring of husbandry animals. Yan-Fu has published in journals such as 'Computers and Electronics in Agriculture', 'Biosystems Engineering', and 'The Transactions of ASABE'. By far, he has published more than 30 journal articles as well as more than 60 papers in conference proceedings. Yan-Fu is currently an associate editor for 'The Transactions of ASABE'. He teaches Machine Learning and Microcontrollers at NTU. He received outstanding teaching award from NTU twice. Yan-Fu has supervised more than 50 graduate and undergrad students and received more than 20 funded projects in the past ten years. Yan-Fu participated in 2019 class of the CIGR Next Leaders Event.