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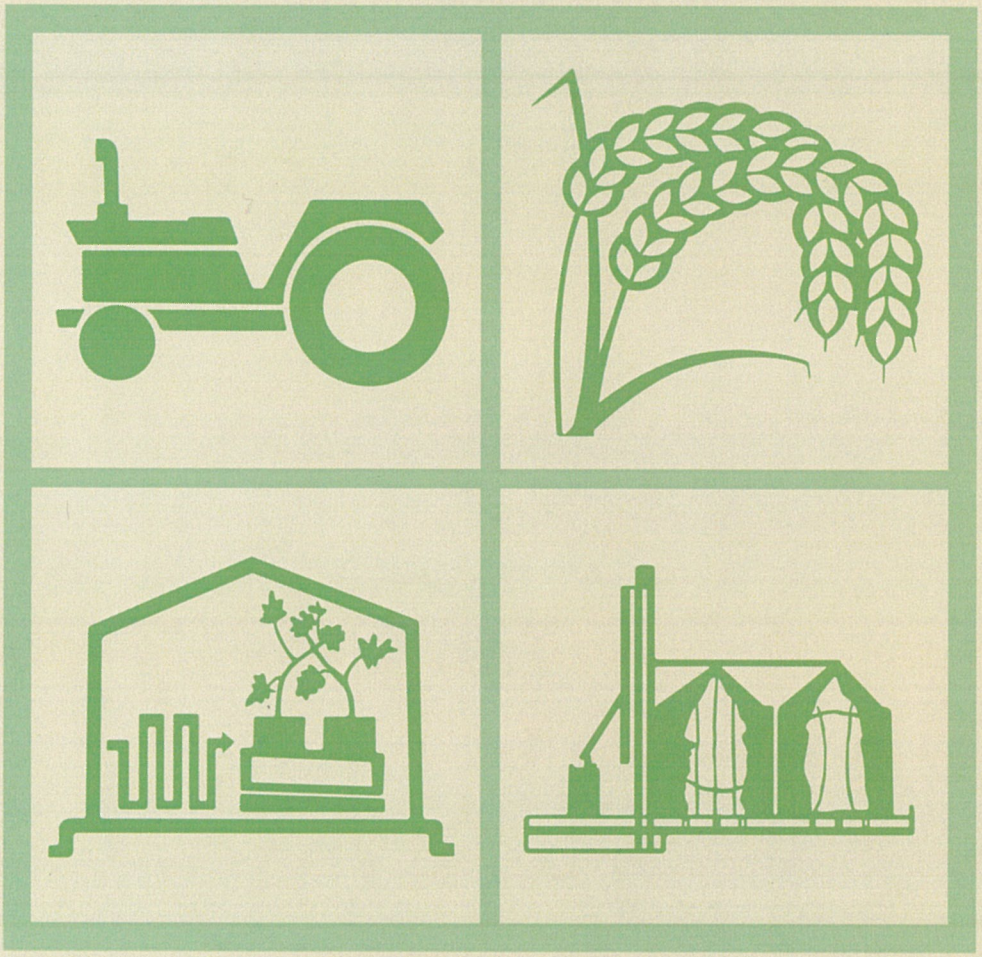
온라인 발표 : 2020년 10월 30일(금)



주최

(사)한국농업기계학회 Korea Society for Agricultural Machinery

농업생산무인자동화연구센터 Agricultural Robotics and Automation Research Center

밭농업기계개발연구센터 UPLAND•FIELD MACHINERY RESEARCH CENTER

스마트팜 연구센터 Smart Farm Research Center

충남대학교 농업과학연구소

전북대학교 JEONBUK NATIONAL UNIVERSITY

13:15 ~ 13:30

농업부산물 수집장치의 요인시험
Factorial Experiment of the Collecting Device for an Agricultural By-product Collector
황석준, 김정훈, 남주석

13:30 ~ 13:45

배추 수확기용 이송 수집부 설계
The Design of Conveying and Collecting Device for Harvester of Chinese Cabage
김규봉, 신서용, 주현식, 신주원, 김영길, 김대철, 김혁주, 손형일, 조용진

13:45 ~ 14:00

트랙터, 승용이앙기, 콤바인의 수명함수 추정
Survival Function Estimation of Tractor, Riding-type Rice Transplanter, and Combine Harvester
김병갑, 이정민, 김성욱

14:00 ~ 14:15

ICT 기술을 적용한 다목적 정밀농업용 자율비행 드론 플랫폼 연구
A Study of an Autonomous Flying Drone Platform for Multi-purpose Precision Agriculture Using ICT Technology
김태천, 천석기, 배기수, 박종진, 심재균

14:15 ~ 14:30

Multi-Viewpoints and Wide Field-of-View Assistance of an Autonomous Tractor Using Tethered UAV
주야오빈, 이경환

구두발표 III ▶ 노외기계시스템 및 정밀농업, 생물공정공학, 스마트팜 시스템 및 신재생에너지

좌장 : 선우훈 교수(순천대)

15:00 ~ 15:15

Biodegradable Nanoporous Films as an Enabling Strategy for Design and Fabrication of Food Packaging Systems
Taeseong Han, Younghyun Gwon, Sunho Park, Yubin Jeon, Hyoseong Kim, Jangho Kim

15:15 ~ 15:30

배추 자동 수확을 위한 센서 융합 기반 자세제어 : 예비 연구
Sensor fusion-based attitude control for automatic cabbage harvesting: A preliminary study
박용현,전종표, 김혁주, 손형일

15:30 ~ 15:45

승용형 자주식 대파수확기의 포장성능시험
Performance Test of Riding and Self-propelled Welsh Onion Harvester
홍성하, 최규홍, 김재동, 하창섭

15:45 ~ 16:00

습지용 연근수확기의 개발
Development of Lotus Root Harvester for Wetlands
조한진, 홍성하

16:00 ~ 16:15

연근수확기의 기술개발 동향
Technology Development Trends of Lotus Root Harvester
조한진, 홍성하

16:15 ~ 16:30

토양 물리적 성질에 따른 수박의 재배적지 분석
Analysis for suitable site of watermelon cultivation by soil physical properties
심준용, 정재민, 손찬수, 조용빈

Multi-Viewpoints and Wide Field-of-View Assistance of an Autonomous Tractor Using Tethered UAV

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Abstract

In recent years, with the continuous development of technology autonomous tractors are applied to farms more and more. But in order to use autonomous tractor in a large field, sens ors equipped on a tractor cannot provide wide Field-of-View(FOV) and acquire of depth prece ption. Therefore, an autonomous tethered UAV is developed as a visual assistant to overcome the perceptual limitations of the sensors by providing an external viewpoint. The co-robots tea m consists of one primary autonomous tractor and one autonomous aerial visual assistant. The UAV mounted five cameras is able to provide stationary third person view and a path to avio d the risk in complex environment for tractor. The main purpose of the tether is to match the run time of the UAV with the tractor, since flight power could be transmitted via the tether. T he autonomous tractor has two main motors that control the steering angle and the velocity of tractor, it allow 2.2m radius turn and maximum speed up to 7.2km/h. The twin channel RTK-GPS provide global position and orientation of tractor. As the results of experiments, the tracto r was driven on the predetermined path in an open playground accurately, the tethered UAV can take off and landing in station located on the top of tractor and rigidly track the autonom ous tractor even in strong wind. Future work will focus on driving in fields where roads are n arrower and more complex.

Keywords

Multi-Viewpoints, Tethered UAV, aerial visual assistant, Autonomous Tractor.

Acknowledgement

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