내일을 위한 정부혁신
보다 나은 농촌진흥청

미래를 위한 인공지능과 스마트농업

스마트농업 크로스코칭 세미나

일자_ 2019. **10. 10.**(목)

장소_ 농촌진흥청 농촌인적자원개발센터(새롬홀)

공동주관_ 농촌인적자원개발센터, (사)한국정밀농업학회

(사)한국정밀농업학회 2019년 추계학술대회 발표자료집

포스터 목차

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

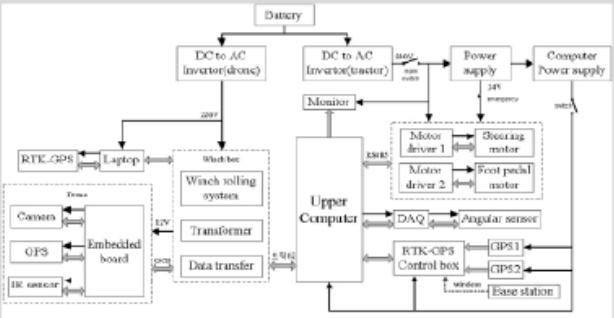
YaoBin Zhu[1] Sun-Wook Beak[1] Sang-Eon Oh[1] Kyeong-Hwan Lee[1,2*]
[1]Department of Rural and Biosystems Engineering, Chonnnam National University
[2]Agricultural Robotics & Automation Research Center, Chonnam National University
*Corresponding author: khlee@jnu.ac.kr

Introduction

- Autonomous tractors are applied to farms more and more. However, sensors equipped on a tractor cannot provide wide field-of-view and acquire depth perception.
- The purpose of this study was to develop an autonomous tractor with multi-viewpoints and wide field-of-view through the stationary third surround view provided by the tethered UAV.

Material & Method

- The corobot system consists of a primary autonomous tractor and a UAV-based aerial visual assistant.
- Five cameras mounted on UAV were able to provide stationary third surround view and a path to avoid obstacles in complex environment for the tractor.
- The autonomous tractor was composed of a twin cannels RTK-GPS and an angular sensor for measuring the steering angle, as well as two main motors that control the steering and the velocity of tractor.



Hardware connection diagram


Autonomous Tractor

Results

- As the results of experiments, the tractor 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 autonomous tractor well.


Take-off and landing status of the tethered UAV

Acknowledgment

- This work was supported by Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry (IPET) through the Agriculture, Food and Rural Affairs Research Center Support Program, funded by the ministry of Agriculture, Food and Rural Affairs (MAFRA)(No. 318094-3 and No.117011-3).