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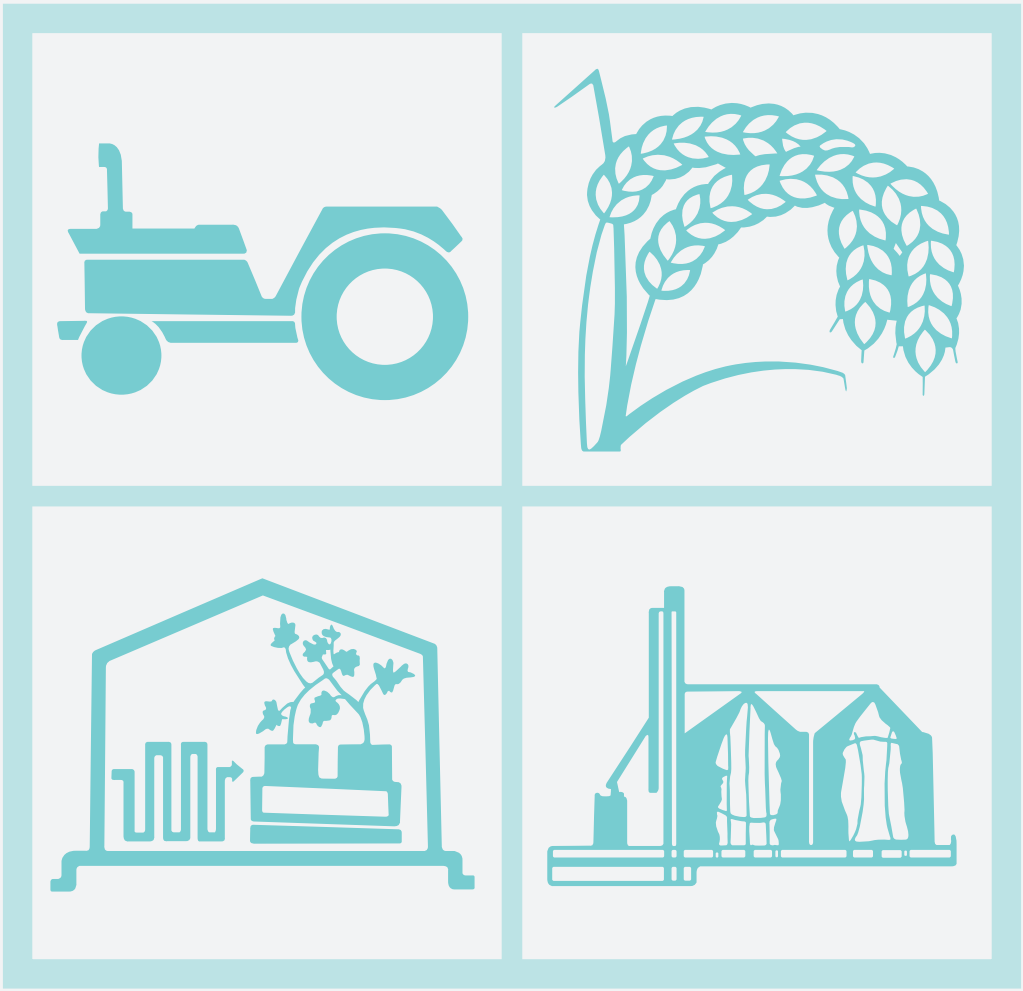

주최

(사) 한국농업기계학회
KSAM Korean Society for Agricultural Machinery

스마트팜 연구센터
Smart Farm Research Center

BAY 2 ▶인공지능 및 정보처리 I

■ 좌장 : 박두산 교수 (경북대학교) ■

9:00~9:12	65	**Automatic Yield Mapping of Chinese Cabbage and White Radish using Crop Identification Algorithm with UAV RGB Images** Dong-Wook Kim(Seoul National University), Gyujin Jang, Hak-Jin Kim*
9:12~9:24	66	**A multi-task model for estimating severity and classifying strawberry diseases on leaves using multi-class Unet** Nguyen Kim Dung(Chonnam National University), Yeong Soo Choi*
9:24~9:36	67	**Patch-YOLO: Counting Small-Sized Broilers in Large-Scale Cage-Free Broiler Houses** Do-Hwan kim(Chonnam National University), Ömer Faruk İnce, Jiwoong Lee, Kyeong-Hwan Lee*
9:36~9:48	68	**RGB 영상 및 딥러닝 영상분할 모델을 이용한 사과 과실 표면결함 검출 기술 개발** Development of a defect detection technology on apple fruits using RGB images and deep learning semantic segmentation models 류지원(서울대학교), 박성민, 김상연, 김응찬, 김성제, 신상우, 김기석*
9:48~10:00	69	**WeedNet-v7: A Dense Multi-Scale Weed Detection Framework** Zhewang Zhang(Chonnam National University), Omer Faruk Ince, Kyeong-Hwan Lee*
10:00~10:12	70	**과실의 실시간 기하학적 정보 계측을 위한 3차원 영상 측정 시스템 및 분석기술 개발** Development of Real-time 3D Imaging System and Analysis Techniques for Measurement of Fruit Morphology 홍석주(농촌진흥청), 이아영*, 김진세
10:12~10:24	71	**Potato Disease Identification Using Weather Data and Image Data.** Nishadi Prasangini Sandaraja Kankanamalage(Seoul National University), Hak-Jin Kim*
10:24~10:36	72	**시간분해능 광열분광법을 이용한 벼 도열병 진단** Diagnosis of Rice Blast Disease Using Time-Resolved Photothermal Spectroscopy 노승우(서울대학교), 박성민, 김응찬, 이창협, 김규민, 장하린, 김기석*
10:36~10:48	73	**딥러닝 기반의 의미론적 분할을 이용한 감수지의 도포율 평가** Evaluation of spray ratio from water sensitive paper using semantic segmentation based on deep learning 성백겸(충남대학교), 강승우, 조수현, 이대현*, 이춘구, 유승화
10:48~11:00	74	**딥러닝을 이용한 소 유방염 검출 기술 개발** Mastitis detection of dairy cow using deep learning 조수현(충남대학교), 강승우, 성백겸, 이대현*, 이민경, 서성원
11:00~11:10		**Break Time**

WeedNet-v7: A Dense Multi-Scale Weed Detection Framework

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Abstract

Weed object detection has long been regarded as a highly challenging task due to its multi-scale, multi-category, and multi-morphological nature. Weeds of the same category exhibit significant differences in size and morphological features at different growth stages, and under natural conditions, weeds often grow densely. However, mainstream object detection frameworks such as YOLOv7 do not excel in handling dense multi-scale tasks, especially in small object detection tasks. In response to this issue, we propose a novel object detection framework called WeedNet-v7, built upon the YOLOv7 architecture. In WeedNet-v7, we introduce a new branch that generates an additional set of (160*160*3) anchor boxes, specifically designed to address the challenges of dense object detection tasks. Correspondingly, we incorporate three different-sized anchor boxes to detect objects of varying scales. Furthermore, we design a multi-channel attention mechanism to enhance small object detection performance. Comparative results in terms of mAP@0.5 show that YOLOv7 achieves an mAP of 83.42% on our dataset, while WeedNet-v7 outperforms it with an mAP of 85.31%. While our network framework does require higher computational resources compared to YOLOv7, it maintains an FPS above 20, meeting real-time weed detection demands, and significantly improving detection accuracy.

Keywords

Multi-scale, Dense object detection, Multi-channel attention

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