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구두발표때	▶ 노외기계시스템 및 정밀농업 V (Room 322B)
16:00~16:12	[좌장 : 조우재 교수(경상국립대)] 159 가변형 UAV 살포 제어기 개발을 위한 실내 비행 시뮬레이션 기반의 살포 분포 특성 평가 Evaluation of Spray Distribution Characteristics Based on Indoor Flight Simulation for Development of Variable UAV Spray Controller 아드하탸 사이풀 하니프, 한철우, 유승화, 한웅철
16:12~16:24	160 Cage-free broiler counting and analysis of feeding and watering behavior based on improved YOLOv5 and Deepsort. 하시어사, 김우영, 이경환
16:24~16:36	162 Active Path Planning Algorithm for Autonomous Mobile Robot Moving in Indoor Environment 첸 티안, 조철현, 파블러, 이경환
16:36~16:48	163 Lyapunov Controller for an Agricultural Four-Wheel Independent Mobile Robot 파블로, 첸티안, 이경환
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17:00~17:12	165 아스팔트 및 노지 조건 내 전동 잡초 제거 로봇 주행 부하 분석 Load Analysis of Electric Driving System of Weeding Robot During Driving in Asphalt and Paddy Field Condition 최지원 백승윤, Md Abu Ayub Siddique, 김용주
17:12~17:24	166 밭 농작업용 전기 플랫폼의 다물체 동역학 시뮬레이션 모델 개발 Development of Multi-Body Dynamics Simulation Model for Upland Electric Platform 윤수영, 박민종, 김용주
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17:48~18:00	170 Impact Of Variability In Dynamic And Solar Intensity On Ground Canopy Sensors Detecting Vegetation Indices 하게 아스라쿨, 레자 나심, 하비네자 엘리에젤, 강영호, 이경도, 정선옥

C age-free broiler counting and analysis of feeding and watering behavior based on improved YOLOv5 and Deepsort.

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Abstract

The large numbers, crowded breeding environment and free movement caused great difficulties in counting and analyzing the feeding and watering behavior of cage-free broilers. Therefore we developed a method of broiler counting in panorama based on YOLOv5. We also combined YOLOv5 and Deepsort multi-object tracking algorithm to analyze feeding and watering behavior. To improve small and overlap broiler detection performance, slice window and weighted merge-NMS were applied to YOLOv5. Besides, a light-weight feature extraction network ShuffleNetV2 was applied to the Deepsort to improve the multi-object tracking performance. The result shows that the accuracy of small and crowded broiler detection at the corner of the panorama were improved by 19%. Training time of the improved feature extraction network was reduced by 0.8 minutes, and the accuracy of the training and testing sets were improved by 0.05% and 5%, respectively. Based on the daily counting results we analyzed broiler density and distribution at different growth stages. The feeding and watering behavior was analyzed by fusing BBox Aspect Ratio, IOU and Euclidean Distance. This research can be used for broiler counting and feeding and watering behavior analysis, which is valuable for achieving intelligent and precise broiler farming.

Keywords

Broiler counting, behavior analysis, weighted merge-NMS, ShuffleNet V2.

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