Self-Reoriented Spraying Robot with Deep Action Learning for Chili Farming

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ABSTRACT

Proper maintenance of chili farming and plant breeding are the main factors to maintain supply stability, prices, high quality, and healthy yields for our society. One of the key elements in chili breeding experiments is the spraying section. However, manual spraying tends to be wasteful of pesticides and foliar fertilizers. Ensuring that the target is sprayed is key alongside other factors such as the landscape, the mounds, and the lush vegetation. In solving those problems, this paper offers an alternative to deep action learning, which is applied to a teleoperated sprayer robot. To involve deep action learning, at least four steps are required; planning, acting, observing, and reflecting, which are summarized in one cycle. In the planning stage, monitoring the assessment of the environment is followed by the process of recognition, detection, and spraying, which involves deep learning in the acting stage. The results at the acting step are evaluated and then fed to the observing step while comparing them with the passing grade section of the system. If the system cannot pass the passing grade, the system is updated and will stop after matching the passing grade. Therefore, spraying by robots in this study is efficient, with intelligence capabilities that can be improved and proven through experiments with acceptable errors. In the future, deep action learning will be applied to traditional chili farming even in a different environment without any identification required.

Kata Kunci: *Spraying Robot , YOLO, Deep learning, Teleoperated robot, SqueezeNet*