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Abstract

An Efficient Case Retrieval Algorithm for Agricultural Case-Based Reasoning Systems, with Consideration of Case Base Maintenance

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Abstract:
Case-based reasoning has considerable potential to model decision support systems for smart agriculture, assisting farmers in managing farming operations. However, with the explosive amount of sensing data, these systems may achieve poor performance in knowledge management like case retrieval and case base maintenance. Typical approaches of case retrieval have to traverse all past cases for matching similar ones, leading to low efficiency. Thus, a new case retrieval algorithm for agricultural case-based reasoning systems is proposed in this paper. At the initial stage, an association table is constructed, containing the relationships between all past cases. Afterwards, attributes of a new case are compared with an entry case. According to the similarity measurement, associated similar or dissimilar cases are then compared preferentially, instead of traversing the whole case base. The association of the new case is generated through case retrieval and added in the association table at the step of case retention. The association table is also updated when a closer relationship is detected. The experiment result demonstrates that our proposal enables rapid case retrieval with promising accuracy by comparing a fewer number of past cases. Thus, the retrieval efficiency of our proposal outperforms typical approaches

Biography:

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Recent Publications:

1. Agriculture 2020, 10(9), 387; https://doi.org/10.3390/agriculture10090387

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