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A Review of Federated Learning in Agriculture

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Abstract

Federated learning (FL), with the aim of training machine learning models using data and computational resources on edge devices without sharing raw local data, is essential for improving agricultural management and smart agriculture. This study is a review of FL applications that address various agricultural problems. We compare the types of data partitioning and types of FL (horizontal partitioning and horizontal FL, vertical partitioning and vertical FL, and hybrid partitioning and transfer FL), architectures (centralized and decentralized), levels of federation (cross-device and cross-silo), and the use of aggregation algorithms in different reviewed approaches and applications of FL in agriculture. We also briefly review how the communication challenge is solved by different approaches. This work is useful for gaining an overview of the FL techniques used in agriculture and the progress made in this field.

Keywords: federated learning, agriculture, smart agriculture, data partitioning, horizontal federated learning

Full text

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