

Abstract Wearable xAI: A Knowledge-Based Federated Learning Framework⁺

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Abstract: Federated learning is a knowledge transmission and training process that occurs in turn between user models on edge devices and the training model in the central server. Due to privacy policies and concerns and heterogeneous data, this is a widespread requirement in federated learning applications. In this work, we use knowledge-based methods, and in particular case-based reasoning (CBR), to develop a wearable, explainable artificial intelligence (xAI) framework. CBR is a problem-solving AI approach for knowledge representation and manipulation, which considers successful solutions of past conditions that are likely to serve as candidate solutions for a requested problem. It enables federated learning when each user owns not only his/her private data, but also uniquely designed cases. New generated cases can be compared to the knowledge base and the recommendations enable the user to communicate better with the whole system. It improves users' task performance and increases user acceptability when they need explanations to understand why and how AI algorithms arrive at these optimal solutions.

Keywords: artificial intelligence; wearable AI; mobile edge computing; case-based reasoning; recommender system

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