Comparing LSTM and KAN Models for Predicting Channel Resource Occupancy in Cognitive Radio

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Abstract

This paper discusses the problem of predicting the occupancy of channel resources for a mobile system based on a cognitive communication system. The data used is a long-term evolution (LTE) radio environment map, a spatiotemporal grid of resources with traffic passing through the cells. The radio environment map is pre-processed and filtered for training artificial neural networks. The prediction accuracy of Kolmogorov-Arnold networks (KAN) and Long-Short-Term Memory (LSTM) is compared. A model has been developed that collects data, identifies and selects frequency zones in which data transmission occurs, trains and tests KAN and LSTM. The predictive model control algorithm is implemented in Python. The LTE simulation model and input data preparation are implemented in MatLab. The experiment results to evaluate the prediction accuracy of channel resource occupancy by KAN and LSTM are presented.

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