Abstract

In this paper, we have trained and tuned a Deep Neural Network (DNN) model to extract the household’s average voltage pattern and utilize it for predicting any potential abnormalities using Artificial Intelligence (AI). To be more specific, this model is a Recurrent Neural Network (RNN) that leverages the Long Short-Term Memory (LSTM) cell as a long-term dependency storage. The logic behind this architecture is to enhance the performance as well as solving the vanishing (and exploding) gradient problem of RNNs. The main objective of this project is to detect abnormalities at the edge (Internet of Thing (IoT) gateway) as a security-oriented proactive approach. Therefore, after training the model with a large-enough train part of the dataset and optimizing it after running the test part of the dataset, the model can be placed at the IoT gateway and recognize the future abnormalities in Time-series voltage dataset of any given household to avoid any potential malicious activity or damage.

Index Terms

Computer Science

Artificial Intelligence

Keywords

LSTM; RNN; DNN; IoT; AI; Deep Learning.