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Flood Forecasting Using Edge AI and LoRa Mesh Network

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Abstract

Remote flood forecasting has exponentially grown over the past decade together with the unprecedented expansion of Internet of Things (IoT) network. This is feasible with the use of long-range wireless communication technology such as LoRa. Ideally, each LoRa device shall process the sensor data locally and trigger warnings to the remote server based on prediction results.

However, conventional prediction methods rely on highly computational artificial intelligence (AI) algorithms, which are not suitable for low-powered LoRa network. In this paper, the LoRa device is integrated with an edge AI model, which is based on long short-term memory (LSTM) neural network. OpenVINO is adopted to optimize the LSTM model before executing the solution on a Raspberry Pi 4 in combination with Intel Movidius Neural Computing Stick 2 (NCS2). Experimental results demonstrate the feasibility of deployment of the customized model on low-cost and power-efficient embedded hardware.

Keywords

Edge AI **LSTM** **Flood forecasting**

LoRa Mesh Network **IoT**

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