



MACHINE LEARNING IN THE INTERNET OF THINGS – STANDARDIZING IOT FOR BETTER LEARNING

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ABSTRACT

The prodigious scale of the machine driven environment has necessitated that machines shall not rely predominantly on the humans to take decisions. The pervasive computing has reduced machine to the size of a 30mm diameter like Bluetooth Low Energy Beacon, and the Internet of Things (IoT) is making these extremely small devices to connect and communicate with each other. Millions of such devices are implanted every day in everything, thus making it difficult for the humans to configure, deploy and refactor each device individually. Machine Learning is one area that enables these devices to learn, and take decisions without being explicitly programmed each time. One of the biggest challenges in machine learning, particularly amongst the miniature computing environment is the interoperability issues of these devices. IoT is throwing up millions of such devices in the computing environment at a very fast scale, thus, sometimes compromising the standards in terms of protocols, software stack, communication, bandwidth, data processing. Therefore, inhibiting the patterns to build up, and proving to be detrimental in taking decision for the machine learning. The aim of this paper is to put forward a mechanism that will help to do away with the interoperability issues and standardize the communication, especially at the software level. A standard is envisaged in this paper, that all the devices located in a particular cluster of the IoT or any connected machine environment shall have to comply with. The futuristic plan is also to develop a python module that can be run by the communication manager to check the device compatibility viz-viz the communication environment. This module will also be able to leverage the power of TensorFlow- An open source machine learning framework and help the users to do specific tasks in TensorFlow, which is otherwise massive workflow if it is done directly via TensorFlow. The Python module will give an option to call TensorFlow API discretely, and will also provide NoSQL type backup facility for data analysis.

Keywords: IoT, Machine Learning, Pervasive Computing, TensorFlow, API, Apache SINGA, Caffe