

Abstract:

Many modern cities are currently encumbered with various challenges among which is the need to promote the culture of environmental sanitation for healthy living. However, advances in information communications technology have given birth to the concept of smart city, which is rapidly being applied to address some of the challenges being faced in such cities. This paper presents the development of an architecture based on smart city technology, for refuse disposal management in communities. A proof of concept prototype was implemented for the proposed architecture using Arduino UNO microcontroller board, proximity sensor, breadboard, refuse bin and a personal computer. The proximity sensor was interfaced with the Arduino board to capture dataset that correspond to the five different positions calibrated on a refuse bin. The dataset was shown to be of good quality since the graph of the mean voltages against the distances is similar to the proximity sensor characteristic graph. To determine the appropriate classifier for realizing the pattern classification unit of the prototype, an experiment was performed using the acquired dataset to train five different variants of the K-NN classifier. The 1-NN classifier was nominated for the prototype because it is simple and it gave higher values of accuracy, precision and recall.