



“Gheorghe Asachi” Technical University of Iasi, Romania



OPTIMIZED PARALLEL DEPTHWISE SEPARABLE CONVOLUTIONAL NEURAL NETWORK-ENABLED SMART WASTE MANAGEMENT IoT IN SMART CITIES

V.G. Anisha Gnana Vincy^{1*}, M. Germin Nisha²

¹Department of Artificial Intelligence and Data Science, Tagore Engineering College, Rathinamangalam, Chennai, Tamil Nadu, India

²Department of Electrical and Electronics Engineering, St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil, Tamil Nadu, India

Abstract

The real-time application of tracking and managing smart cities is sophisticatedly performed with the Internet of Things paradigm. The predominant issue of the smart cities is solid waste management which explicitly impacts the health of the society and environment. Managing waste is a challenging task worldwide and several works have been presented by the researchers to ensure the minimization of waste by proper disposal of waste in the respective way. The proposed work detects the objects using the Attentive Single Shot Multibox detector (ASSD) followed by the Intuitionistic Fuzzy Local Binary Pattern (IFLBP) based feature extraction and convolutional neural network (PDSCNN) technique for the classification of the feature vectors that are extracted from the detected objects. The overfitting issues that occur during the training process can be tackled with the introduction of the IKO algorithm. For the validation of the effectiveness, we conducted the simulation in MATLAB simulator and analysed the robustness by comparing it with the state-of-art works.

Key words: Attentive Single Shot Multibox detector, parallel depthwise separable convolutional neural network, smart cities, solid waste management

Received: April, 2024; *Revised final:* July, 2024; *Accepted:* September, 2024; *Published in final edited form:* September, 2024

* Author to whom all correspondence should be addressed: e-mail: anishavincy@gmail.com