

Synthetic Data Generation for Food Waste Pelletizer Using TGANs

Pattan Afrid Ahmed

SCOPE

Vellore Institute of Technology

Chennai, India – 632014.

pattanafrid.ahmed2020@vitstudent.ac.in

Dr. Priyadarshini J

SCOPE

Vellore Institute of Technology

Chennai, India – 632014.

priyadarshini.j@vit.ac.in

Abstract— Our main goal of synthetic data generation is because building an experimental dataset is costly and time consuming. For automation of food waste pelletizer using Fuzzy logic and the working require defining a proper set of rules or membership functions and validating with simulations referencing towards the dataset. Generative algorithms like Tabular Generative Adversarial Network (TGANs), Tabular Variational Autoencoders (TVAEs) are mainly used for synthetic tabular data generation. Conditional TGAN are applying the mode-specific normalization to overcome the non-Gaussian and multimodal distribution and deal with the imbalanced discrete columns. The Generator network tries to replicate the original data distribution in the latent space without directly accessing the original data distribution. And the Discriminator network tries to classify the original and fake (generated) data where the loss of it is back propagated to the Generator and the weights are updated. Both these networks are run in parallel training the Generator efficiently. Generated dataset is evaluated using different metrics like KV divergence, KS Test, GM log Likelihood. Simulation of the fuzzy control system applied to variable speed and temperature with the generated dataset.

Keywords— Fuzzy logic, TGANs, TVAEs, CTGANs, KV divergence, KS Test, fuzzy control system.