

An Ensemble CRT, RVFLN, SVM Method for Estimating Propane Spot Price

Haruna Chiroma^{1,4}, Sameem Abdul-kareem¹, Abdulsalam Ya'u Gital²,
Sanah Abdullahi Muaz¹, Adamu I. Abubakar³, Mungad¹, and Tutut Herawan¹

¹ Faculty of Computer Science and Information Technology

University of Malaya

50603 Pantai Valley, Kuala Lumpur, Malaysia

² Department of Computer Science

Universiti Teknologi Malaysia

Kampus UTM Skudai, Johor Bahru, Malaysia

³ Department of Information Science

International Islamic University Kuala Lumpur, Malaysia

⁴ Department of Computer Science,

Federal College of Education (Technical), Gombe, Nigeria

hchiroma@acm.org, asgital@yahoo.com, 100adamu@gmail.com,

samaaz.csc@buk.edu.ng, {sameem,mungad,tutut}@um.edu.my

Abstract. In this paper, we propose an ensemble of the CRT-RVFLN-SVM (Classification and Regression Tree (CRT), Random Variable Functional Link Neural Network (RVFLN), and Support Vector Machine (SVM)) to improve robustness and effectiveness in estimating propane spot price. The propane spot price data which are collected from the Energy Information Administration of the US Department of Energy and Barchart were used to build an ensemble CRT-RVFLN-SVM model for the estimating of propane spot price. For the purpose of evaluation, the constituted intelligent computing technologies of the proposed ensemble methodology in addition to Multilayer Back-Propagation Neural Network (MBPNN) were also applied to estimate the propane spot price. Experimental results show that the proposed ensemble CRT-RVFLN-SVM model has improved the performance of CRT, RVFLN, SVM, and MBPNN. The can help to reduce the level of future uncertainty of the propane spot price. Propane investors can use our model as an alternative investment tool for generating more revenue because accurate estimations of future propane price implies generating more profits.

Keywords: Propane Spot Price, CRT, RVFLN, SVM, Estimation.

1 Introduction

The propane is an energy product obtained through the refining of crude oil, and further refinement of natural gas, although in small proportion compared to the amount obtained from crude oil. Yet, the propane is considered as a refined product of crude oil, and natural gas [1]. Propane has various uses in the society including its use