LaTeX Author Guidelines for CVPR Proceedings

Quinn Murphey
University of Texas at San Antonio
1 UTSA Circle San Antonio, TX
quinn.murphey@my.utsa.edu

Adrian Ramos
University of Texas at San Antonio
1 UTSA Circle San Antonio, TX
adrian.ramos@my.utsa.edu

Gabriel Soliz
University of Texas at San Antonio
1 UTSA Circle San Antonio, TX
gabriel.soliz@my.utsa.edu

Abstract

For decades, the ability to accurately project price fluctuations of goods and services has been sought after. It would be both beneficial to stakeholders and as a basis of the projection of future economic outcomes. It's critical that we can be prepared for unexpected events that can drastically alter the markets. Using historical reports of commodity price during times of distress and disasters, we hope to uncover better forecasting and improve both preparedness and predictive results. In order to accomplish this task, this paper will focus on analyzing historical documents of the price of commodities fluctuation as time passes. As pervious research has demonstrated, there are multiple reports and results in aiding better forecast projections.

1. Introduction

The price fluctuation of good and stocks are often difficult to predict due to the numerous amounts of variables that play an important role of the price function. While there exists research that reflects on those expected variables [5]. Additionally, the research conducted which compares multiple results comprised from other researchers and their unique test leading to their results [6]. The importance of being able to accurately predict the price of commodities is vital to creating plans to aid those in need. The more accurate our forecasting ability is, the better prepared we can hope to be in uncertain times. It would allow emergency services and first responders to allocate enough supplies in the event of unpredictable events that could cause server damage to our infrastructure. However, there has been minimal research on the price fluctuation of goods and stocks due to external events, such as war, pandemics, or environmental catastrophes. While reports have been brought up that show certain effects of specific tragedies, such as the COVID-19 pandemic report [2]. The rate that prices fluctuate of goods and stocks during times of crisis and compared to other times of crisis could potentially help uncover areas which are most impacted. Including opportunities for potential preventive measures to attempt to thwart a severe effect.

The source code for our project can be found at https://www.github.org/Nragis/cs4263-project.

2. Related Work

From what we have observed there seems to be certain trends when trying to predict natural gas prices. The trend majority of the articles such as "Forecasting Natural Gas Spot Prices with Machine Learning" use is by taking the price of the gas as far as you have a data set for and then using adaptive and regression models to predict the gas prices future. The next theme that some articles use such as "Deep Neural Network Model for Improving Price Prediction of Natural Gas" is that they look at the current trend of natural gas and other similar items on something like google and if there is a trend of natural gas possibly becoming volatile with other forecasts also coming to this conclusion then it changes the prediction accordingly. The least common way that I have found is one explored in the paper "Natural Gas Price Prediction with Big Data" where the authors use sentiment analysis on a large body of literature, most commonly the news. This way while uncommon is surprisingly effective with it being able to tell the sentiment within the text and according to how drastic it is it changes the predictions.

3. Proposed Approach

For this project we will approach it in our own unique way. We will utilize the Energy Information Agency's Nat-

ural Gas dataset spanning the past several years. We will also utilize a time-series regression algorithm to analyze and predict the price for natural gas. Using a time-series regression algorithm should help us with utilizing and processing the data set we have chosen to its fullest extent utilizing every bit of knowledge we have to give an accurate prediction not only of the past but also the future. Utilizing this method our prediction data should be superior to the traditional econometric models and have the ability to predict future data points.

4. Data

5. Experiments

6. Results

References

[1] Aliyuda Ali, M. K. Ahmed, Kachalla Aliyuda, and Abdulwahab Muhammed Bello. Deep neural network model for improving price prediction of natural gas. In *2021 International Conference on Data Analytics for Business and Industry (ICDABI)*, pages 113–117, 2021.

[2] Stephen B. Reed Dave Mead, Karen Ransom and Scott Sager. The impact of the covid-19 pandemic on the food price indexes and data collection. *Monthly Labor Review. U.S. Dept. of Labor, Bureau of Labor Statistics*, August 2020. 1

[3] Periklis Gogas Dimitrios Mouchtaris, Emmanouil Sofianos and Theophilos Papadimitriou. Forecasting natural gas spot prices with machine learning. *Energies*, 14(18), 2021. 5782.

[4] James P. Smith Iris Kesternich, Bettina Siflinger and Joachim K. Winter. The effects of world war ii on economic and health outcomes across europe. *Institute for the Study of Labor (IZA), Research Paper Series*, (6296), 2012.

[5] Ricardo Alberto Carrillo Romero. Generative adversarial network for stock market price prediction, 2019. Stanford University CS230 Final Project. 1

[6] Vishwaas Khare Sarvagya Srivastava and R. Vidhya. Economic forecasting using generative adversarial networks. *International Journal of Engineering Research & Technology*, 10(5), 2021. 1

[7] Yuanyuan Tang, Qingmei Wang, Wei Xu, Mingming Wang, and Zhaowei Wang. Natural gas price prediction with big data. In *2019 IEEE International Conference on Big Data (Big Data)*, pages 5326–5330, 2019.