Electricity Theft Detection in Smart Grids Using Sarimax and OCR

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Abstract: *This study proposes a novel approach to detect electricity theft in smart grids by combining SARIMAX (Seasonal Autoregressive Integrated Moving Average with Exogenous Factors) models with Optical Character Recognition (OCR) techniques. Electricity theft remains a significant challenge in smart grid systems, leading to revenue losses and operational inefficiencies. Traditional methods often fall short in accurately identifying and addressing such illicit activities.*

The integration of SARIMAX models leverages time-series data, capturing patterns and anomalies indicative of electricity theft. These models incorporate exogenous factors such as weather conditions, economic indicators, and historical consumption patterns, enhancing the detection accuracy. Additionally, OCR technology is applied to analyze meter readings and identify discrepancies or irregularities that may signal potential theft instances.

The synergy between SARIMAX and OCR offers a comprehensive solution for electricity theft detection in smart grids. By harnessing advanced analytics and machine learning algorithms, this approach enables utility providers to proactively identify suspicious activities, mitigate revenue losses, and ensure the integrity of their grid infrastructure

Keywords: OCR, SARIMAX, Electricity Theft, Electricity Board, Desktop Application, Machine Learning.