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Predicting PV Output from Solar Sites to Help Businesses Estimate ROI

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Abstract: *This work focuses on the critical importance of predictability of power output in the integration of solar photovoltaics into traditional electrical grid systems. The authors aim to find the best-fit model to solve this problem, thereby facilitating the transition of businesses from traditional power consumption models to renewable sources. The researchers estimate that governments are losing hundreds of millions of dollars annually in the solar sector due to a decline in solar power generation, which could be as high as 52%. This study attempts to address this issue by proposing a solution to improve power output predictability. The findings of this research could have significant implications for businesses and policymakers interested in transitioning to renewable energy sources.*

Keywords: Solar photovoltaics, power output predictability, best-fit model,K-Nearest Neighbors (KNN), Random Forest (RF), LightGBM (LGBM), Deep Neural Network(DNN), Long Short-Term Memory(LSTM), Meta-learning.

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