Professional Presentation Title: Comparative Evaluation of Temporal Fusion Transformer and Traditional Models for Energy Forecasting Across Load, PV Generation, and Price Domains

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Abstract

Accurate forecasting of electricity load, renewable generation, and market prices is critical for operational efficiency and risk management in modern power systems. This presentation compares the performance of the Temporal Fusion Transformer (TFT) against traditional and deep learning baselines—Generalized Linear Models (GLM) for load forecasting and Convolutional Neural Network–Long Short-Term Memory (CNN-LSTM) networks for photovoltaic (PV) generation and price forecasting. Using real-world datasets, we evaluate models on short-term (1–3 day) horizons. Results indicate that TFT provides competitive or superior performance in the tested short-term cases, while also offering interpretability through attention mechanisms.

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 Harish Yadav is part of the SAS Energy Forecasting Team, where he builds deep learning models for energy load, solar power, and price forecasting. A former Applied Data Scientist at Microsoft, he enhanced Bing Shopping's search capabilities, and outside of work he's an avid runner who recently completed the full marathon at the Tata Mumbai Marathon 2025.

Arnie de Castro is a Product Manager at SAS specializing in Energy Forecasting Cloud.   He has over four decades of experience in software development, consulting, research, and teaching in power systems. He holds a doctorate in Electrical Engineering from Virginia Tech and has led work in forecasting, grid operations, and renewable integration using advanced machine learning and AI methods.

Student Presentation Title: Angular Combining for Probabilistic Forecast Reconciliation: Application to Temporal Hierarchies in Wind Power Forecasting

Sehyuk Lee and Jooyoung Jeon

Abstract

Accurate forecasting is vital for decision-making across domains. Forecast reconciliation improves accuracy by leveraging complementary information across aggregation levels. While most probabilistic reconciliation uses quantile-based methods, the broader combining literature shows both quantile-based (vertical) and probability-based (horizontal) approaches have merit, with the best choice depending on the dataset. Angular combining has emerged as a flexible framework that interpolates between these extremes, producing distributions with means equal to the average of individual forecasts and controllable variance—lower than vertical and higher than horizontal under certain conditions. We extend angular combining to probabilistic reconciliation within hierarchical structures, validated on temporal hierarchies from one to 48 hourly horizons for wind power forecasting. Our data-driven approach uses scoring rules and cross-validation to select angular degrees and combining coefficients, offering objective parameter criteria. Results from Sinan and Taebaek wind farms show the method provides a unified, adaptive framework that calibrates automatically to dataset characteristics rather than enforcing a binary reconciliation choice.

Sehyuk Lee is a 2nd year PhD student in Industrial Engineering at Yonsei University. He holds a BS in Management Information Systems and Computer Science from Korea University. His research interests include probabilistic forecasting and forecast reconciliation. His current work focuses on developing flexible combining frameworks for probabilistic forecast reconciliation, integrating concepts from forecast combination literature with hierarchical forecasting methodologies.

Jooyoung Jeon is an Associate Professor at KAIST (Korea Advanced Institute of Science and Technology). His research focuses on probabilistic forecasting and decision analysis, with applications in energy systems, climate change, market risk, and healthcare analytics