

An Enhanced Artificial Neural Network for Air Temperature Prediction

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Abstract—

The mitigation of crop loss due to damaging freezes requires accurate air temperature prediction models. An improved model for temperature prediction in Georgia was developed by including information on seasonality and modifying parameters of an existing artificial neural network model. Alternative models were compared by instantiating and training multiple networks for each model. The inclusion of up to 24 hours of prior weather information and inputs reflecting the day of year were among improvements that reduced average four-hour prediction error by 0.18°C compared to the prior model. Results strongly suggest model developers should instantiate and train multiple networks with different initial weights to establish appropriate model parameters.

Keywords— Time-series forecasting, weather modeling