

## A New Nonlinear State-Space Model and Its Application

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**Abstract :** In this work, a new nonlinear model will be introduced. The model is in the state-space form. The nonlinearity of this model is in the state equation where the state vector is multiplied by its self. This technique makes our model generalizes many famous models as Lotka-Volterra model and Lorenz model which have many applications in the real life. We will apply our new model to estimate the wind speed by using a new nonlinear estimator which suitable to work with our model.

**Keywords :** nonlinear systems, state-space model, Kronecker product, nonlinear estimator

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