

Phongsephen Jantana 2007: Updating Parameters in Autoregressive Process. Doctor of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Associate Professor Prapaisri Sudasna-na-Ayudhya, Ph.D. 168 pages.

The aim of this thesis is to compare operation time and mean squares error from predicted autoregressive process when mean of the processes were known or unknown. One of the estimating methods is the least squares method, which is a numerical approach, and the other method is the Yule-Walker equation method, which is a statistical one. Those two approaches are applied to predict the processes for one time. When the periods were rolled, they are applied to predict one step ahead for the long periods (1,000-25,000 times). Besides the discounted least squares method is also applied to estimate parameters in autoregressive process and the experiment were extended by using sinusoidal data. The results from predicted a stationary process one step ahead for one time indicate that the Yule-Walker equation with Durbin-Levinson Recursion have less operation time than the least squares method. But when the period rolled for a long time ($\geq 10,000$ times), the results indicate that the least squares with invertibility or QR factorization have less operation time than Yule-Walker equation. However, those two methods give the same or nearly prediction error. The results from a sinusoidal data show that the decomposition method has less operation time than using the autoregressive model.

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