

Selected Readings in
**COMPUTING AND
TELECOMMUNICATIONS**

Editors
Mira Kartiwi
Teddy Surya Gunawan
Aisha Hassan Abdalla Hashim



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Teddy Surya Gunawan and Ismail Haji Hassan Dualeh

ABSTRACT

Speech enhancement is widely used in every day's applications that most people take for granted, as due to its popularity and increasing of demand, engineers are trying various approaches of enhancing the noisy speech. One of the methods for improving is trying on different methods of filtering techniques. Thus, this instigates an introduction of a filtering technique known as Kalman filtering. The objective of this project is to generate an enhanced output speech signal from the input signal involving the application of a Kalman filter estimation technique. In this project, Kalman filter is used to filter the noisy speech from the noise. The results of this speech enhancement technique are demonstrated and obtained with the aid of MATLAB 7. Accurate estimations by the Kalman filter on speech is simulated and presented. Integration of traditional spectral subtraction method and Kalman filter showed that the objective performance was increased by 170 %. Comparison between the clean speech and the estimated speech by applying subjective and objective tests is described.

13.1 INTRODUCTION

People have been using speech to communicate messages since human civilizations began and up today. So when speaker and listener are close each other, and the environment are quiet, the communication is easy to understand and no problems encounter the speech. But when the environment is noisy, communication will not be successful. Today people use electrical communication devices, such as telephones, cellular phones,