

## **ABSTRACT**

### **THE ESTIMATOR OF LINEAR AND NONLINEAR NONPARAMETRIC REGRESSION CURVE BY FOURIER SERIES METHOD AND NADARAYA-WATSON METHOD**

**By**

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If  $x$  is a predictor variable and  $y$  is a response variable of the regression model  $y = f(x) + \varepsilon$  with  $f$  is a regression curve or a regression function which not yet been known and  $\varepsilon$  is independent random variable with mean 0 and variance  $\sigma^2$ , hence function  $f$  can be estimated by parametric and nonparametric approach. In this paper function  $f$  is estimated by nonparametric approach. The estimation of curve regression is done by smoothing technique based on observation data.

This study aimed to estimated regression curve using Fourier and Nadaraya-Watson method for linear and nonlinear function based on the value of mean square error and optimal bandwidth.

The result showed that Fourier and Nadaraya-Watson method can be used to estimate linear regression. However for nonlinear function, Fourier method is better than Nadaraya-Watson method.

*Keywords: Nonparametric Regression, Nadaraya-Watson Estimator, Fourier Series Estimator.*