COMPARING THE PERFORMANCE VEHICLE KILOMETERS TRAVELED MODEL BY USING MULTIPLE LINEAR REGRESSION ANALYSIS WITH BACK-PROPAGATION LEARNING OF ARTIFICIAL NEURAL NETWORK

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Presentation Outline

- ✶ Introduction
- ✶ Objectives
- ✶ Method
- ✶ Conclusion

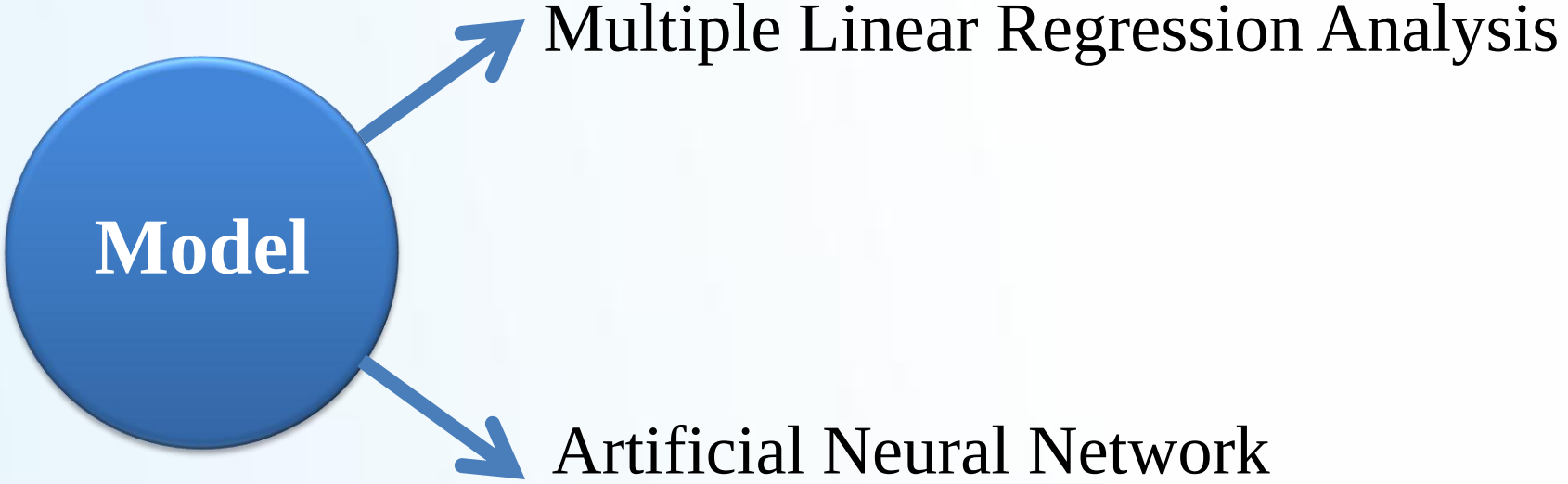
Introduction

This research is vehicle kilometers traveled model by using multiple linear regression analysis with back-propagation learning of artificial neural network

Objectives

- To explain the difference in the mean absolute percentage error (MAPE) which indicates the efficiency of prediction.
- To identify variables that affect vehicle kilometers traveled

Method


Model
Multiple Linear Regression Analysis
Artificial Neural Network
(back-propagation learning)

MULTIPLE LINEAR REGRESSION ANALYSIS

Model summary

Model	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.176	0.162	10.189

Regression Analysis Equation

$$Y=9.354-0.132X_1+0.032X_2+11.146X_3+5.830X_4+3.591X_5$$

Adjust R_a^2 = 0.162 F =12.539

Y	= vehicle kilometers traveled	X_3	= inhabitant
X_1	= Age	X_4	= private employees
X_2	= Speed	X_5	= state enterprise

ARTIFICIAL NEURAL NETWORK

(ANN)

ANN Analysis

- massive parallel
- distributed data and computation
- learning
- generalization
- adaptation
- content-based processing
- fault tolerance

ANN Processing

INPUT

TRAIN | TEST

↓

ANN

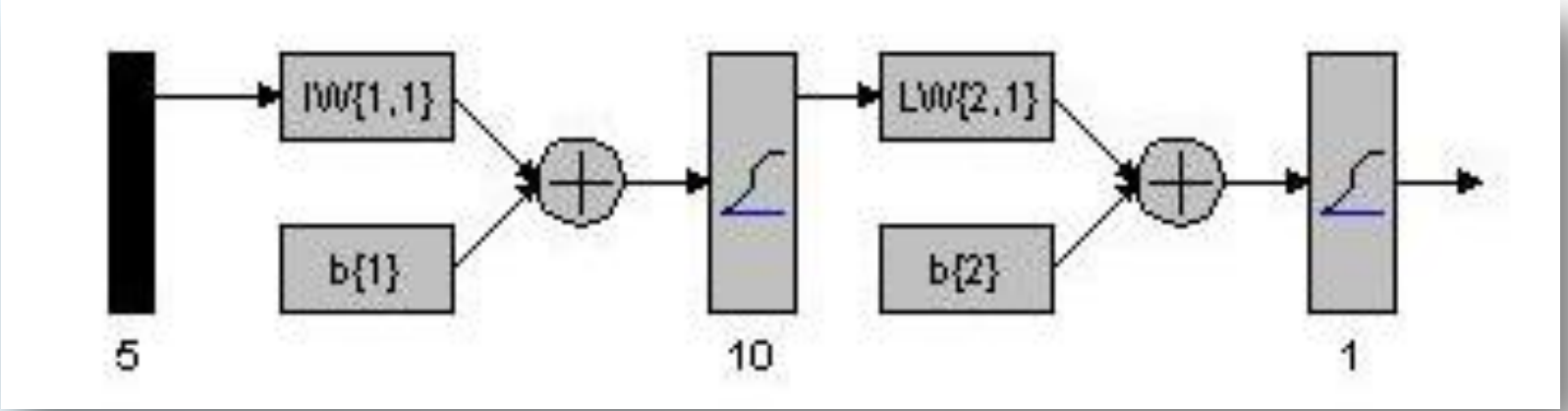
700 | 300

↓

OUTPUT

VEHICLE KILOMETERS TRAVELED

Neural Network Architecture

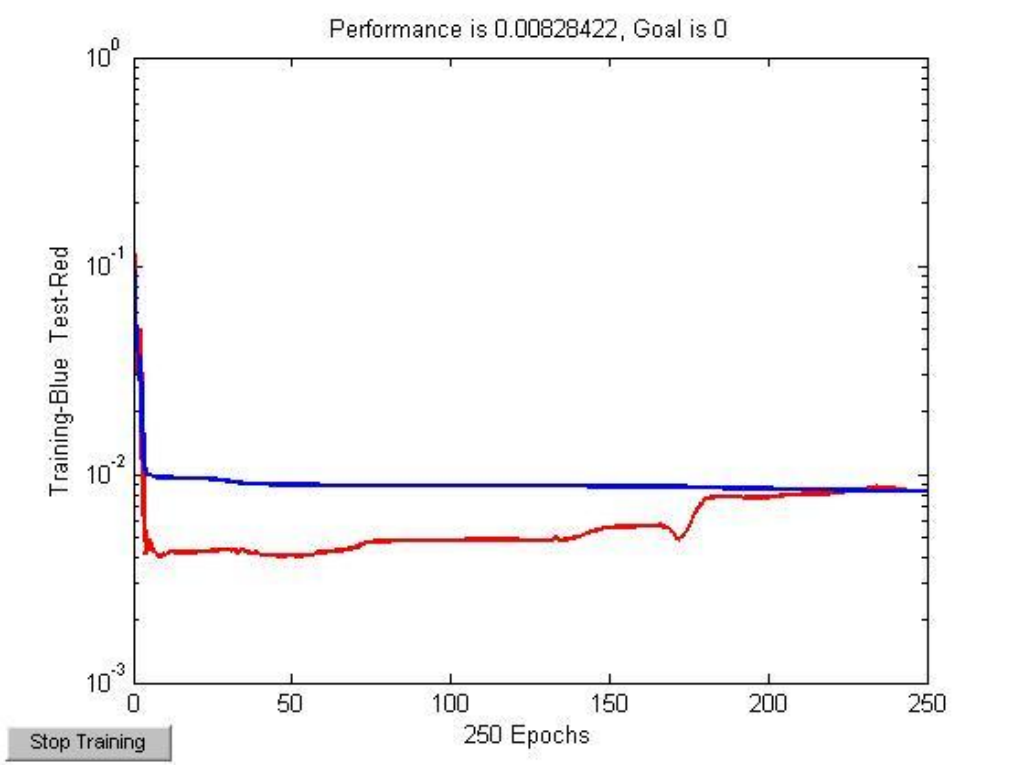


2 Networks

- 10 Neural
- 1 Neural

ANN Analysis

Testing Performance vehicle kilometers traveled model by ANN



Mean Square Error at 250 Epochs

Conclusion

- How to multiple linear regression analysis is equal to 27.37%
- How to back-propagation learning of artificial neural network is equal to 24.64 %

From the mean absolute percentage error; MAPE showed that neural network method is effective in predicting a better model to multiple linear regression analysis.

SUT

THANK YOU !!

Connectivity - Shipment Tracking - Carrier management