

TELKOM UNIVERSITY

Abstract

School of Computing

The Graduate School

Master of Engineering

Prediction and Anomaly Detection of Rainfall for Planting Time Based On Evolving Neural Network in Soreang, Bandung

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As an agricultural country and located around the equator line, Indonesia geographical position between two continents and oceans is very sensitive to regional and global atmospheric circulations as sunspot, cosmic rays, Indian Ocean Dipole(IOD) and Southern Oscillation Index(SOI). The disruption of one circulation can affect climate and weather. Extreme anomaly climate is very influential in the agriculture field because it can decrease growing area, production and productivity of food crops. In this research, rainfall prediction has been conducted using Evolving Neural Network (ENN) and completed with anomaly detection for finding the best starting time for planting, so the risk of loss due to rainfall anomalies can be minimized because farmers can adjust the planting starting time with the change of the rainfall and the attention to anomalies that occur during the growing seasons. From three scenarios, one hidden layer in Artificial Neural Network(ANN) architecture was sufficient and ENN had good performance in different dataset. Rainfall prediction result used all data (January-December) from 1999-2013 had the accuracy of 84.6%, 66.02% for dry season (April-September) and 79.7% for wet season (October-March). Based on prediction and anomaly detection in this research, in Soreang the first week of January, April and October 2014 were recommended for the starting time of planting in 2014.

Keywords : Rainfall, Prediction, Evolving Neural Network, Genetic Algorithm, Artificial Neural Network, Anomaly Detection