# Comparing the Capabilities of Artificial Neural Networks Regression Models in Wheat Yield Prediction

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## Abstract

The yield of the wheat crop is affected by the climate and soil parameters such as moisture and nutrients, plant pests and diseases. In this paper, the capabilities of various architectures of artificial neural networks such as Linear Neural Network (LNN), Multi-Layer Perceptron (MLP), Radial Basis Function (RBF) and Generalized Regression Neural Network (GRNN) are investigated for wheat yield prediction based on remotely sensed images.The effects of vegetation condition, moisture, nutrients and pests on wheat yield are represented by spectral indices those are extracted from remotely sensed data. The experimental results for wheat yield prediction are evaluated in eight fields in Kurdistan, Iran. The obtained difference errors between actual and predicted wheat yields show the capabilities of the GRNN regression model with a mean error of 0.0061. Moreover, using RMSE and MAE for evaluating the regression models indicates that the GRNN regression model has the best prediction results with RMSE=0.0075 and MAE=0.0063 compared to the RBF, LNN and MLP models.

**Keywords**: Yield prediction, Wheat, Neural Network, Spectral Indices .

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