

# **Research on the application of Artificial Neural Networks for the enrollment forecasting problem at Thai Nguyen University of Education**

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**Abstract:** This study proposes an artificial neural network (ANN)-based solution for forecasting student enrollment at Thai Nguyen University of Education. Accurate enrollment prediction is critical for strategic planning, resource allocation, and academic management. Traditional statistical methods often fail to capture the complex, non-linear relationships inherent in enrollment data. To address this, we developed a multi-layer perceptron (MLP) model trained on historical admission data, including academic year, program type, entrance exam scores, and demographic factors. The model's performance was evaluated against conventional regression techniques using metrics such as Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). Results demonstrate that the ANN model significantly outperforms traditional approaches, achieving higher prediction accuracy and better generalization. The findings confirm that artificial neural networks provide a robust and effective tool for enrollment forecasting, enabling the university to make data-driven decisions regarding faculty staffing, infrastructure development, and student services. This research contributes to the application of machine learning in higher education management within the Vietnamese context.

**Keywords:** Artificial neural network, enrollment forecasting, Thai Nguyen University of Education, application solution