

# Jaringan Syaraf Tiruan dalam Memprediksi Kapasitas Daya Dukung Tiang Bor

**Muhammad Zaki**

*Doktor of Civil Engineering Department- Diponegoro University- Semarang*

**Wardani. SPR,**

*Prof of Civil Engineering Department- Diponegoro University- Semarang*

**Ilyas. T,**

*Prof of Civil Engineering Department- Indonesia University- Jakarta*

## **Abstrak**

*Artificial Neural Network (ANN) yang lebih terkenal dengan sebutan Metode Jaringan syaraf tiruan sekarang lebih sering di aplikasikan dalam perhitungan atau menganalisa di bidang Geoteknik. ANN mampu menganalisa dengan sedikitnya data input maupun input data yang tidak saling berkaitan satu dengan yang lain. Metode ANN yang digunakan dengan algoritma *Back-propagation Feedforward multilayer* dengan memasukan variable Input Geometri Pondasi, Mutu Beton, Penyelidikan Tanah dan Input PDA berupa  $\emptyset$ ,  $L_p$ ,  $L_e$ ,  $A$ ,  $f^c$ ,  $BTA$ ,  $f(c)$ ,  $N_{shaft}$ ,  $N_{tip}$  dan  $P$ . Penelitian ini diharapkan mendapatkan nilai Rank Indek (RI) dari mendekati nilai 1 dan nilai  $RMSE < 1$ , sehingga model penelitian yang dihasilkan dapat dibandingkan dengan hasil PDA (*Pile Driving Analyzer*) dan rumus konvensional dalam menghitung kapasitas tiang bor dengan tingkat signifikansi pada variable keutuhan tiang berkisar  $\pm 20,5\%$  dan sedangkan tingkat signifikansi untuk variable  $L_p$ ,  $L_e$ ,  $D$ ,  $A$ ,  $f(c)$ ,  $N_{shaft}$  dan  $N_{tip}$  berkisar 15% sampai 28.%.*

*Keyword : Artificial Neural Network, Pile Driving Analyzer, Back-propagation*

# **Artificial Neural Networks in Predicting Capacity of Pole Cap Supporting Capacity**

**Muhammad Zaki**

**Doctor of Civil Engineering Department- Diponegoro University- Semarang**

**Wardani. SPR,**

**Prof. of Civil Engineering Department- Diponegoro University- Semarang**

**Ilyas. T,**

**Prof. of Civil Engineering Department- Indonesia University- Jakarta**

## **Abstract**

*Artificial Neural Network (ANN)* is better known as *Artificial Neural Network* method is now more often applied in calculations or analyzes in the field of geotechnical. ANN can analyze with at least data input and data input that is not related to each other. ANN method used with multilayer Back-propagation Feed-forward algorithm with input variable Geometry of Foundation, Concrete Quality, Soil Investigation and PDA Inputs are  $\emptyset$ ,  $L_p$ ,  $L_e$ ,  $A$ ,  $f'_c$ ,  $BTA$ ,  $f(c)$ ,  $N_{shaft}$ ,  $N_p$  and  $P$ . This research is expected to get Rank Index (RI) and RMSE value  $<1$ , so the research model can be compared with PDA (Pile Driving Analyzer) and conventional formula to calculate ultimate bearing capacity and settlement. Significance level on variable Pile Integrity ranges from  $\pm 20.5\%$  and the significance level for  $L_p$ ,  $L_e$ ,  $D$ ,  $A$ ,  $f(c)$ ,  $N_{shaft}$  and  $N_{tip}$  variables ranges from 15% to 28.%.

*Keywords : Artificial Neural Network, Pile Driving Analyzer, Back-propagation*