

Artificial Intelligence Approach to Water Treatment Processes: Case Study of Daspoort Treatment Plant, South Africa

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Abstract : Artificial neural network (ANN) has broken the bounds of the convention programming, which is actually a function of garbage in garbage out by its ability to mimic the human brain. Its ability to adopt, adapt, adjust, evaluate, learn and recognize the relationship, behavior, and pattern of a series of data set administered to it, is tailored after the human reasoning and learning mechanism. Thus, the study aimed at modeling wastewater treatment process in order to accurately diagnose water control problems for effective treatment. For this study, a stage ANN model development and evaluation methodology were employed. The source data analysis stage involved a statistical analysis of the data used in modeling in the model development stage, candidate ANN architecture development and then evaluated using a historical data set. The model was developed using historical data obtained from Daspoort Wastewater Treatment plant South Africa. The resultant designed dimensions and model for wastewater treatment plant provided good results. Parameters considered were temperature, pH value, colour, turbidity, amount of solids and acidity. Others are total hardness, Ca hardness, Mg hardness, and chloride. This enables the ANN to handle and represent more complex problems that conventional programming is incapable of performing.

Keywords : ANN, artificial neural network, wastewater treatment, model, development

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