

Advances In Design Of Control System For Paper Machine Headbox

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ABSTRACT

In the present paper, it is shown how a simple strategy can be used very effectively to design a artificial neural network control system for air pressurized headbox control of a paper machine. It is well known that the interaction between stock flow and stock level occurs in the headbox of the machine, thus representing a MIMO system. The stock being handled by a wet end of paper machine has therefore a pronounced effect on drainage and retention. This paper discusses the simulation and control of pressurized headbox control system through the general use of this remarkable new tool, which has been combined with rule based systems and traditional data base manipulation techniques to form a neural network control system performing two functions: one, the creation of software sensors, which provide on-line measurements of variables which in the past could only be measured in the laboratory; second, an advisory control system to complement a regulatory control system. In present investigation, back propagation artificial neural network controller has been designed through Simulink software. It also compares the performance of ANN with conventional controller (PID). The PID controller parameters are based on a trial and error approach owing to difficulties in establishing solution for the nonlinear process. The simulation results for continuous system with conventional controller (PID) are also shown for comparison purposes.

Keywords: Modeling, ANN, Headbox