

Desired Closed-Loop Based Self-Tuning Fractional PID Controller for Wind Turbine Speed Control

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Abstract : Lately, fractional PID controller has gained more interests because it involves two more tuning parameters, the fractional order integration and the fractional order differentiation, in their structure. This type of controller has been introduced in the control system theory in a continuous effort to enhance the system control quality performances. In this paper a self-tuning fractional PID controller for wind turbine speed control is proposed. The fractional PID controller's five parameters are self-tuned as the system dynamics or operating points change using formulas based on a desired closed loop response. A simulation study of the wind turbine speed control has been done to demonstrate and validate the performance and effectiveness of the proposed control scheme.

Keywords : Fractional PID controller, self-tuning, wind turbine speed control