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Design and Implementation of a Fuzzy Controller for Inter-Stand Tension in a Tandem Mill

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This paper presents the design and implementation of a fuzzy logic controller for regulating inter-stand tension in a tandem mill. The developed fuzzy controller utilizes input variables such as tension error, rolling force, exit speed, and speed correction, and applies a rule base derived from operator experience to adjust the gap position and speed references. The controller operates in three distinct modes: normal run, low speed, and sheet mode, employing Mamdani-style inference and the centroid method for defuzzification. Simulation implementation results demonstrate that the fuzzy controller offers greater flexibility and robustness compared to classical PID controllers, effectively handling complex, multi-variable process conditions.

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