



## **A NOVEL SOFT COMPUTING APPROACH TO COMPONENT FAULT DETECTION AND ISOLATION OF CNC X-AXIS DRIVE SYSTEM**

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**ABSTRACT**—We propose a novel soft computing (SC) based approach to design fault detection and isolation (FDI) systems for industrial plants, in particular a highly nonlinear CNC X-axis drive system's component fault detection. The aim of this paper is twofold. One is to present a general description of various concepts such as the novel fuzzy-neuro architecture that uses fuzzy clustering to build a nominal model, fuzzy decision-making subsystems, a central processing unit for estimation of fault location, and finally RBF neural networks to estimate fault size. The other aim is to apply proposed method to diagnosis of component faults of a CNC X-axis drive system amid significant noise levels. Simulation results demonstrate the significance of the proposed approach.