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# Experimental modeling techniques in electrical discharge machining (EDM): A review

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## Abstract

Electrical discharge machining (EDM) is a widely used non-conventional machining technique in manufacturing industries, capable of accurately machining electrically conductive materials of any hardness and strength. However, to achieve low production costs and minimal machining time, a comprehensive understanding of the EDM system is necessary. Due to the stochastic nature of the process and the numerous variables involved, it can be challenging to develop an analytical model of EDM through theoretical and numerical simulations alone. This paper conducts an extensive review of the various experimental (or empirical) modeling techniques used by researchers over the past two decades, including a geographic and temporal analysis of these approaches. The major methods employed to describe the EDM process include regression, response surface methodology (RSM), fuzzy inference systems (FIS), artificial neural networks (ANN), and adaptive neuro-fuzzy inference systems (ANFIS). Additionally, the optimization methods used in conjunction with these methods are also discussed. Although RSM is the most commonly used empirical modeling technique , recent years have seen an increase in the use of ANN for providing the most accurate predictions of EDM process responses. The review of the literature shows that most of the investigations on experimental EDM modeling were conducted in Asia. 

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