Innovative Method of Measuring Electrode Wear During EDM Drilling Process Using Vision System

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Abstract The aim of this project is to develop a fully automated electrode wear detection system in EDM by using machine vision system and apply this system in detecting electrode wear in EDM drilling. Machine vision system was image-based technology used to perform automatic inspection and analysis of the electrode wear for EDM drilling. The high resolution's DSLR camera as monitoring device to capture the image. The brass electrode with the diameter of 3 mm undergo hole making process with a depth of 10, 20, 30, 40, and 50 mm to obtain the level of wear. The images of the electrodes were remotely captured using DSLR camera then read from the laptop and undergo image processing process using Matlab software to calculate and determine the electrode wear. The result showed the wear percentage of the electrode is 4.235% for 10–30 mm in depth and 3.59% for depth of 30–50 mm. This project showed that the developed system was suitable and applicable in monitor an EDM electrode super drill machine.

Keywords Electrode wear · Vision system · DSLR · EDM · Power drill

1 Introduction

Rapid advancements in the image-processing method and machine vision systems have empowered direct electrode wear estimation to be proficient in the field of EDM [9]. Kaneko et al. [5] presented an optical measurement of the electrode

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