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عنوان مقاله:

Evaluation of Cutting Performance of Diamond Saw Machine Using Artificial Bee Colony (ABC) Algorithm

محل انتشار:

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خلاصه مقاله:

Artificial Intelligence (AI) techniques are used for solving the intractable engineering problems. In this study, it is aimed to study the application of artificial bee colony algorithm for predicting the performance of circular diamond saw in sawing of hard rocks. For this purpose, varieties of fourteen types of hard rocks were cut in laboratory using a cutting rig at 5 mm depth of cut, 40 cm/min feed rate and 3000 rpm peripheral speed. Four major mechanical and physical properties of studied rocks such as uniaxial compressive strength (UCS), Schimazek abrasivity factor (SF-a), Mohs hardness (Mh), and Young's modulus (Ym) were determined in rock mechanic laboratory. Artificial bee colony (ABC) was used to classify the performance of circular diamond saw based on mentioned mechanical properties of rocks. Ampere consumption and wear rate of diamond saw were selected as criteria to evaluate the result of ABC algorithm. Ampere consumption was determined during cutting process and the average wear rate of diamond saw was calculated from width, length and height loss. The results of comparison between ABC's results and cutting performance (ampere consumption and wear rate of diamond saw) indicated the ability of metaheuristic algorithm such as ABC to evaluate the cutting performance.

کلمات کلیدی:

ampere consumption, Cutting performance, Metaheuristic algorithm, Wear rate

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