## A Hybrid Derivative-Free Optimization Method for Pass Schedule Calculation in Cold Rolling Mill

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**Abstract :** This paper presents an innovative solution for complex multi-objective optimization problem which is a part of efforts toward maximizing rolling mill throughput and minimizing processing costs in tandem cold rolling. This computational intelligence based optimization has been applied to the rolling schedules of tandem cold rolling mill. This method involves the combination of two derivative-free optimization procedures in the form of nested loops. The first optimization loop is based on Improving Hit and Run method which focus on balance of power, force and reduction distribution in rolling schedules. The second loop is a real-coded genetic algorithm based optimization procedure which optimizes energy consumption and productivity. An experimental result of application to five stand tandem cold rolling mill is presented.

**Keywords :** derivative-free optimization, Improving Hit and Run method, real-coded genetic algorithm, rolling schedules of tandem cold rolling mill

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