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APPLYING THE MODIFIED CUCKOO SEARCH TO THE CUSTOMISATION OF AN INDUSTRIAL PRE-MIXER

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Abstract: The Modified Cuckoo Search was used to customise the design of a pre-mixer for use in a pressure let-down station heater. This is a true industrial test application for this novel optimisation algorithm. A commercial-off-the-shelf (COTS) mixer was used as a bench mark to assess the impact of Modified Cuckoo Search. In addition to customisation of the pre-mixer's design using Modified Cuckoo Search, the commercial Ansys Design Exploration v16.0 software was applied to the problem. This package utilises the Non-Dominated Sorted Genetic Algorithm-II (NSGA-II). The results of our study showed that by using these optimisation algorithms at least a 30% improvement in the performance as compared to the COTS design could be achieved. Further to this, it was found that the free and open source Modified Cuckoo Search performed comparatively to the commercial package Ansys. This will be significant for small to medium sized enterprises that are often limited by budget constraints to using off the shelf devices.