**Guidelines for Student Reports**

# Implementation of Taguchi's Method for optimal design using Orthogonal Arrays theory

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**Abstract**

Orthogonal Arrays (OAs), which have a profound background in statistics, play an essential role in Taguchi's method. Orthogonal Arrays were introduced in the 1940s and have been widely used in designing experiments. They provide an efficient and systematic way to determine control parameters so that the optimal result can be found with only few experimental runs.

Using the concept of Orthogonal Arrays, Taguchi method effectively reduces the number of tests required in an optimization process. Although this method has been successfully applied in many fields such as chemical engineering, mechanical engineering, IC manufacture, power electronics, etc., it is not well known to the electromagnetics community, and only limited applications are available. in Taguchi method is introduced to the electromagnetics community, demonstrating its great potential in electromagnetic optimizations. Compared to other optimization techniques, such as the Genetic Algorithm and the Particle Swarm Optimization (PSO), Taguchi method is easy to implement, and can converge to the global optimum solution very quickly.

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