Orthogonal Array Microgrid

To cover this gap of knowledge and draw potential recommendations for modern microgrid implementations, in this paper a review of the main design factors of current microgrids is performed, also based on the experience gained during the realization of the Prince Lab experimental microgrid located at the Polytechnic University of Bari [10].This study focuses on ...

By applying the Taguchi"s orthogonal arrays, the number of experiments, N exp, T, is such that the number of columns of the orthogonal matrix N F * = N L J-1 N L-1 is greater than or equal to the number of factors, N F, where J is selected such that the number of experiments N exp, T = N L J, which corresponds to the number of rows of the orthogonal matrix.

File names: A file oa.N.k.s.t.name indicates an orthogonal array with N runs, k factors, s levels, and strength t. This is an array of size N by k, with entries from 0 to s-1, with the property that in any t columns you see each of the s^t possibilities equally often.

Links to Orthogonal Arrays. The following links are connected to images of the orthogonal array named in the link title: L4 Array. L8 Array. L9 Array. L12 Array. L16 Array. L"16 Array. L18 Array. L25 Array. L27 Array. L32 ...

Brown [16] studied the nature of material flow and shear plane angle during orthogonal cutting of a wax specimen using cast grids with a pith of 380µm. Childs [17] and Leopold and co-workers [18-20] used microgrids in combination with a visioplasticity technique to study flow patterns and velocity fields during orthogonal cutting. However

This work introduces a preliminary step in which experimental design techniques, namely, an orthogonal array experiment and a factorial-effect chart are used to find an operation method ...

Introduction Outline 1 Introduction 2 Relationship to Coding Theory 3 Hadamard Matrices and Generalized Hadamard Matrices 4 Mixed Level OAs 5 The Lattice of N-Row OAs 6 Use of OAs for Computer Experiments 7 Semi-balanced arrays 8 Ordered orthogonal arrays 9 Balanced Orthogonal Multi-Arrays 10 Other Topics 11 Conclusions John Stufken (University of Georgia) ...

Orthogonal arrays are frequently listed in handbooks/manuals. Users often extract the listed designs and use th em blindly without thinking. NOTE OF CAUTION: choose orthogonal arrays wisely -- select the array with highest possible resolution so as to minimize the effect of any erroneous assumptions we make regarding effects being negligible ...

Microgrids can effectively decrease carbon emissions and help achieve sustainable development of society.

However, higher renewable energy penetration may go against reliable energy supply due to the inherent intermission and randomness of renewable energy sources. ... Based on orthogonal arrays, the Taguchi method can provide results close ...

Keywords: Energy system, Microgrid, Orthogonal array, Genetic algorithm, Experimental design. Full Text PDF [3750K] Browse "Advance Publication" version. Abstracts References(21) The equipment and operation planning of a compound energy system (microgrid) with renewable energy sources is a dynamic, multivariate, nonlinear problem. Genetic ...

Nested space-filling designs are popular for conducting multiple computer experiments with different levels of accuracy. Strong orthogonal arrays (SOAs) are a special type of space-filling designs which possess attractive low-dimensional stratifications. Combining these two kinds of designs, we propose a new type of design called a nested strong orthogonal ...

An example is given in this presentation to explain the orthogonal array (L18)-GA hybrid analyzing method. The proposed analysis method can be utilized to improve the design parameters and ...

DC microgrids especially for commercial and residential appli-cations due to the technological advances in power electronics. Furthermore, DC systems have various advantages over their ... strategy based on Taguchi"s orthogonal array is designed for solving the optimization problem. [9] introduces off-line

Abstract-- A microgrid is considered to be a smart power system that can integrate local renewable energy effectively. However, the ... Taguchi"s orthogonal array testing method. In [5], a hybrid stochastic/robust optimization model was proposed to minimize

The authors maximized the profit due to the coalition of home microgrids, modeled uncertainties using a "Taguchi"s orthogonal array" technique, optimally scheduled battery energy storage system, and implemented a demand response program to obtain a flatter demand curve. ... The microgrid and the main grid exchanges power through the slack ...

Optical layout of the microgrid array LWIR polarimeter instrument. where L is the spectral radiance as radiated into a hemisphere, A d is the area of the detector and L represents the solid angle ...

Highlights A newly developed orthogonal array-GA hybrid method with a fuel cell cascade system. The equipment capacity of a microgrid and the operational method of the equipment were optimized. The objective function was the minimization of the facility cost and fuel cost over ten years. The convergence characteristic of the proposal analysis method improved ...

Then, the Taguchi"s orthogonal array (OA) testing method is used to provide possible testing scenarios. A simple, but practical, search strategy based on OA is designed for solving the optimization problem. By optimizing the worst-case scenario, the energy management solution of the proposed model is robust against

most of the possible ...

Key words : Energy system, Microgrid, Orthogonal array, Genetic algorithm, Experimental design 1. Introduction Decentralizing a vehicular energy system can decrease power transmission losses, effectively use the heat from exhaust, and promote the use of renewable energy. However, renewable energy systems must be stabilized by combining

Orthogonal array and a large set of orthogonal arrays are important research objects in combinatorial design theory, and they are widely applied to statistics, computer science, coding theory, and cryptography.

Scenario-based robust energy management exploiting upper and lower bounds is used to deal with the uncertainties. Taguchi"s orthogonal array method is used to reduce the large number ...

Simple and Linear Orthogonal Arrays An orthogonal array is a simple if all its rows in are different. An orthogonal array is linear if the symbol set for some prime power and the rows of form a subspace (of the vector space) having dimension . A linear orthogonal array is necessarily simple, and is a power of in a linear orthogonal array. D.R ...

Orthogonal Array-based Latin Hypercube Designs (OALHDs) have not only become popular in practice among strategies used in the development of computer experiments but also useful whenever interest is focused on performing some physical experiments. Design construction for computer experiments is a new issue in this part of the world since it is more ...

In order to handle the uncertainties, Taguchi"s orthogonal array testing approach is utilized. Then, the shortage or surplus of the MGs power should be submitted to a central EMS in the secondary level. ... EMSs are operating separately for each microgrid (MG) by considering the problem constraints, power set-points of generation resources, and ...

First, the proposed algorithm introduces an orthogonal array and factorial- effect chart (Taguchi, 2010), which are experimental design techniques, and determines an operation method that is ...

PDF | On May 14, 2018, Greg A. Finney and others published Performance of a microgrid polarizer array employing a micro-optic registration element | Find, read and cite all the research you need ...

Then, the Taguchi"s orthogonal array (OA) testing method is used to provide possible testing scenarios. ... Xiang et al. [111] proposed an optimisation model for an interconnected microgrid based ...

114 A.S. Hedayat 1.2 Rao"s Bounds An important and basic problem in the study of orthogonal arrays is the existence of OA(N,k,s,t) for given values of s >= 2,t >= 2,k >= t,N ? 0(mod st) can be treated as the problem of determining the minimal number of runs N, denoted by F(k,s,t),inanyOA(N,k,s,t) for given values of k, s and t.The problem can also

Taguchi"s Orthogonal Array Testing. Microgrids offer the advantage of enhancing the utilization of renewable resources within the network. However, the sporadic nature of these resources poses a significant challenge. The production of energy from renewable sources is contingent upon meteorological variables such as wind speed and solar ...

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