achieve the desired level of availability. The model can be further used for planning of maintenance activities, inventory, servicing capacities and dynamic forecast of system characteristics.

Keywords: Repairable system, Repair rate, Availability, Maintenance

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DEAHP Model Based on the Spectral Properties of Pairwise Comparison Matrices

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Abstract: This paper proposes a new DEAHP model entitled as the DEA/RAR model which employs the Data Envelopment Analysis (DEA) methodology for generating local weights in the Analytic Hierarchy Process (AHP). The model is described by two parameters whose feasible regions are determined by a spectral radius of pairwise comparison matrix and two heuristics are developed to obtain desirable values for these parameters. The obtained values form the restrictive assurance region (RAR) of the variables of the DEA/RAR model which is a subset of the assurance region (AR) of the existing DEA/AR model, Wang et al. (2008). It is proved that the new model calculates true weights when it applies to perfectly consistent pairwise comparison matrices. Some advantages of the DEA/RAR model over DEA/AR model are presented by several illustrative examples. Besides, a numerical example shows that the model parameters can be determined so that the proposed model produces local weights that are very close to the ones obtained by the famous Saaty's method.

Keywords: DEAHP, DEA/AR, Assurance region, Restrictive assurance region, Spectral radius.

♦ B12 Mathematical Programming (Linear & Nonlinear Programming)

Minimization with Coupled Constraints, Quasi-Varitaional Inequalities - Solution Methods

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Abstract: Some minimization problems with constraints are naturally formulated in the form: find $x_* \in C(x_*)$ such that $f(x_*) \leq f(z)$, $\forall z \in C(x_*)$, where f: $R^n \to R$ and C: $R^n \to 2^{Rn}$. Hence, we require that a minimization problem and a problem of fixed point of a set-valued mapping should be solved simultaneously. Generalization of this problem is quasi-variational inequality: $x_* \in C(x_*)$ such that $F(x_*)$, $z - x_* \geq 0$, $\forall z \in C(x_*)$. Some classical minimization methods were modified and adapted for solution of these problems [Antipin et al. (2018); Facchinei et al. (2015); Mijajlović and Jaćimović (2015)]. In our talk we will preset some iterative and continuous methods for solving quasi-variational inequalities, establish sufficient conditions for the convergence of the proposed methods and derive estimate of the rates of the convergence. Particularly, we will consider consensus-based algorithm for solving these problems (Nedić & Ozdaglar, 2009).

Keywords: Minimization, Coupled constraints, Quasi-variational inequalities, Projection methods.

On a New Method for Generating Random, Optimal, Linear Optimization Problems

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Abstract: The practical efficiency of any linear optimization algorithm can be evaluated by using either well-known benchmark collections (e.g., Netlib, Meszaros) or random instances. This work presents a new special-purpose Linear Problem (LP) generator in order to construct random, optimal, instances. This generator produces optimal instances by creating a number of hyper planes that are tangent to a closed sphere (polyhedron). Moreover, we present some computational results by using the proposed LP generator and also discuss about other similar approaches.

Keywords: Linear optimization, Mathematical software, Geometric interpretation.