RESEÑAS / BOOK REVIEW

Operator theory and Interpolation / International Workshop on Operator Theory and Applications, IWOTA '96

Las teorías de Sistemas y Control emplean sofisticados métodos de la teoría de operadores y a la vez suministran nuevas ideas y problemas a esta rama de la Matemática. Por esta razón la conferencia bianual "Teoría Matemática de Redes y Sistemas" (MTNS) es seguida con mucho interés por los especialistas de teoría de operadores. Como una iniciativa de J.W. Helton and I. Gohberg un "Taller Internacional en Teoría de Operadores y sus Aplicaciones" (IWOTA) es organizado desde inicio de los años 80, como un satélite de MTNS. En el libro que estamos reseñando se publican los trabajos presentados a la IWOTA celebrada en junio de 1996 en la Universidad de Indiana, Bloomington como preludio de la MTNS celebrada en St. Louis.

Los trabajos que aparecen en este volumen representan la mayor parte de las temáticas que fueron abordadas en el taller. Sobresalen especialmente los trabajos relacionados con la teoría de interpolación moderna, la cual ha experimentado notables progresos en los ultimos años.

Muchos de los trabajos que aparecen en este volumen están particularmente relacionados con los resultados de Sz-Nagy en teoría de interpolación y dilatación.

Como es usual, los 15 artículos que aparecen en el presente volumen fueron sometidos a un proceso de revisión.

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Modelling and Decisions in Economics.
Essays in honor of Franz Ferschl

This book is divided into 3 Sections: Decision Theory, Statistics and Econometry and Operations Research. It contains 16 essays in Honour of Franz Ferschl's 70th Birthday. The papers range from theoretical oriented results to real life applications, form ethical problems to economical recomendations. The contributors are well known specialists of these. The some of the contributions are:

Kistner, K.P.: Lot sizing and queueing models some remarks on Karmarkar's model.

It fixes that M/M/1 queuing model and Karmarkar's approach (Karmarkar (1987), Management Sc., 33) do not match. This result follows because the assumptions that the arrival of batches is related with a Poisson distribution and that the completion time is an exponential random variable are not acceptable. The inconsistencies are removed. The author removes the second assumption and introduces the independence for set up and processing time. The expectation T of the time a lot spends in the system is calculated and its relation with lot size is analysed. The overestimation of T by Karmarkar's approach is obtained.

A similar procedure is applied to the processing time of a batch. The analysis of the time between the release of two batches is studied and corresponding means and variances are derived.

Inderfurth, K. and T. Jensen: Analysis of MRP policies with recovery options.

The authors study the coordination in a single stage system. The problem is the co-ordination for Material Requirement Planning (MRP) policies. The case of external returns is studied. The critical run-out time (for excess returns), the control of inventory levels, the re-manufacturing rule, the projected total requirements for a time span and other parameters are derived for the cases of external and internal returns. Their combinations with reactive and proactive planning are reported.

Beckmann, M.J.: Bidding for research funds.

The problem of looking for research funds is modelled by a 2-persons game. Two applicants (players) compete for a fund F. Each of them invest a certain effort x. When the probability of obtaining the revenue is proportional to it the game has a solution in pure strategies. If we use other inputs in the competition (curriculum, prestige, etc) the chance of winning changes. The author derives the optimal pure strategy. The weight of the efforts may be seriously reduced if other aspects enter into consideration. The optimal strategy for mixed strategies is also analysed. The payoff of player 1 is defined as $F \cdot prob.(y < x) - x$. The mixed strategies and the optimal rule are derived. The analysis of a n-person game is also studied.

Fandel, G. and M. Lorth: Separate versus joint inventories when customer demands are stochastic.

The authors derived that when two customers compete for obtaining an item and the demands are stochastic the best solution is that an independent entrepreneur takes care of the inventory.

The item is assumed to be purchased by the same supplier.. The calculus may be developed by using an iterative procedure (Tersine. R.J. (1988, Principles of inventory and materials management. N. Holland)) or a heuristic proposed in the paper. The role of the standard deviation and the correlation coefficient is studied. A numerical example is worked out with illustrative porpoises.

Neck, R. and S. Karbuz: Optimal macroeconomic policies with and without the monetary instrument.

It is an expository paper. It aims to illustrate the role of statistics and operations research in macroeconomic policy design. A macroeconomic model for the Austrian economy is studied using tools from these disciplines. The Econometric model FINPOL2 was used for estimation. It is a dynamic-non linear model. Optimal policies

were computed using the algorithm OPTCON. A simulation model was elaborated for the period 1993-2000. Two optimisation experiments were developed. The predictions and optimal values obtained appear in tables.

A brief description of the algorithms is given. Detailed information on them may be obtained in Matulka, J. and Neck R. (1992, Ann. Of. Oper. Res., vol. 27) and Neck R. And Karbuz S. (1994, Proceedings of the European Simulation Symposium 1994. SCS, Istanbul).

Feichtinger, G.: Dynamic economic models of optimal law enforcement

It surveys aspects of the mathematical modelling of the relation between the police agencies, the victims and the criminals. The competition is modelled by a dynamic game. The initial number of offenders permit to establish policies considering its relation with a threshold that represents a critical level. The policies may be derived from the steady-state equilibrium. The optimal path obtained from the analysis is given in a figure. Multiple equilibria may occur.

A three persons non zero dynamic game is the proposed model. It is related with other population dynamic problems. Some results in particular cases are discused.

Schneeweiss, H.: Resolving the Ellsberg paradox by assuming that people evaluate repetitive sampling.

It revisits the Ellsberg's Paradox. Some cases are analysed. They permit to establish relevant aspects of the rationality of the decision making process.

The Bayesian rationality is compared with the observed behaviour. It contradicts the expected preference to decisions based on subjective probabilities. The author derives that the effect of observing a set of results by risk averse devisors is the preference of unambiguous situations. The rationality of using subjective expected utilities is reworked. The actitude in betting is characterised by the mean and the variance of the gain. The betting act for any number of observations may be analysed through this parameters. The results of Ellsberg are derived using them. An example of investment under uncertain profits is discussed with illustration porpoises.

Bruckmann, G.: A note on the Herfindahl Index of concentration.

It is devoted to the analysis of the use of the indexes of concentration.

The role of the value of the shares that the firms hold is discussed. The robustness of Herfindah-'s index, for the unknowledge of the shares is of small firms is shown. Other properties of it are discussed. An example is worked out.

Beinsen, L.: On the question of speculation in favour of or against the Euro before ist start.

The author fixes the role of speculation and the possibility of studying the effect of it using mathematical modeling. The behavior of the Euro in the monetary market is the modeled problem. The equilibrium is characterized by a regression model. It relates: 3 month forward rate, spot rate, short term interest rate and a time index. Different equations are proposed. For each of them an example is worked out. The use of a random walk approach for forecasting is also analyzed using real world data.

Liu, S. and W. Polasek: Maximum Likelihood Estimation for The VARC-VARCH model: a new approach.

The authors develop a Maximum Likelihood based approach for heteroskedastic time series.

The information matrix of the estimator for the model $yt = (t+ut)$ is derived. The computation needed is considerably small. The multidimensional VARCH (q) model is used for illustration porpoises. Taking $K = q = 1$ a particular case of the corresponding VAR-VARCH model is worked out and a simulation experiment is performed. The numerical computations were performed using S-Plus.

Primal-Dual Interior-Point Methods

This book is a new contribution that is welcome by scholars. It may be used in graduate courses on OR as well as in some topics of undergraduate curricula.

The book is set out of 11 chapters and 2 annexes. The central theme of the book is primal dual algorithms. A general introduction is developed. Undergraduate courses may use the two first chapters. The most important primal-dual algorithms are presented (path-following, potential reduction, unfeasible-interior -point), some extensions are discussed (monotone LCP, mixed and horizontal LCP, strict complementarity, convex QP, etc.).

The author discuss in the annex A some theoretical aspects and the other annex presents the software libraries available.

164 references are quoted..

The broad sense of the contents of the book make it of general interest for OR specialists . Hence it will be useful for professors. graduate students as well as engineers and other practitioners.

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