سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

سامية محمد مصطفى

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

سامية محمد مصطفى

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة

سامية محمد مصطفى

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

ON VECTOR OPTIMIZATION PROBLEMS UNDER UNCERTAINTY

ATHESIS

Submitted to Mathematics Department,
Faculty of Science, Tanta University,
In Partial Fulfillment of the
Requirements for the Degree
of Master of Mathematics

IN

(Pure Mathematics)

BY

Hamiden Abd El-Wahed Khalifa

Department of Mathematics
Faculty of Science
Tanta University

2002

بسم الله الرحمن الرحيم

والصلاة والسلام على أشرف المرسلين سيدنا محمد وعلى آله وصحبه أجمعين

" رب أوزعني أن أشكر نعمتك التي أنعمت علي وعلى
والدي وأن أعمل صالحاً ترضاه وأصلح لي في ذريتي
إني تبت إليك وإني من المسلمين "

صدق الله العظيم

سورة الأحقاف الآية "١٥"

إهـــــــــداء

إلى من تحملا معي الصبر على هذا الطريق الطويل

إلى

.. رفيقا العمـــــــــر ..

.. تقديراً للتضحية ..

.. إجـــــــــلالاً للوفـاء ..

إلى أبي وأمي

حامدين

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H. A. Khalifa

NOTE

The present is submitted to Tanta University in partial fulfillment of requirements of the degree of Master of Science in Mathematics.

Beside the research work introduced in this Thesis, the candidate has attended four graduate courses within two years including

(1) Abstract Algebra,

(2) Numerical Analysis,

(3) Functional Analysis,

(4) Partial Differential Equations.

The application Hamiden Abd El-wahed Khalifa Ahmed has successfully passed the find examination (1999-2000) of these courses.

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PREFACE

Preface

The main objective of this thesis is the achievement of basic theoretical and applicational results as well as methodologies for solving fuzzy linear fractional programming problems, multiobjective linear fractional programming problems, fuzzy portfolio optimization as a quadratic programming approach and the investment problem as a dynamic programming approach. It focus on four main areas of study:

a- Characterizing the efficient solutions.

b- Characterizing the fuzzy optimal solutions.

c- The fuzzy portfolio optimization problem as a convex quadratic programming approach.

d- The fuzzy investment problem as a dynamic programming approach.

Applications and algorithms for fractional programming have been treated in considerable detail since the first work of Isbell and Marlow [18]. Kwiesielewicz et al., [20] have presented a resolution method for a fuzzy linear programming (FLP) with fuzzy numbers in the right hand side of the constraints. Bellman and Zadeh in [6] proposed the concept of decision making in fuzzy environments. Ammar in [1] characterized the solution set of the multiobjective nonlinear fractional programming problem using fuzzy set theory, Buckley in [7] considered the situation where all parameters are fuzzy, He also in [8] deduced an optimal solution by possibility concepts. Lai and Hwang in [21, 22] assume that the parameters have a triangular possibility distribution. They use an auxiliary model which is solved by multi-objective linear programming methods. Hussein et al in [17] presented some stability notions for fuzzy nonlinear programming

problem, Tong in [35] defines a goal for the objective function and then by using Zadah's "Min" operator obtains an optimal solution.

Fractional programming problems are a subject of wide interest. Since they provide a more universal apparatus for a wider class of problems incorporate planning, a agricultural planning, public policy decision maker, financial analysis of a firm, marine transportation, health care, educational planning, bank balance sheet management, production planning, traffic planning, network flows, and game theory [6]. But as is obvious, just considering one criteria at a time usually does not cater to real life problem because almost always two or more objectives are associated with a problem. Generally most of the objectives are conflicting in nature, therefore one cannot optimize all the objectives simultaneously. Multicriteria programming problem plays a very important role in formulation of the set of most preferred solution and a decision maker can select the best solution.

Jonathan in [19] presents a simplex-based solution procedure for the multiple objective linear fractional programming problem. By two methods, firstly, departing slightly from the traditional notions of efficiency, secondly, augmenting the feasible region as in goal programming. Youness in [39] gives the duality problem for multiobjective fractional programming by two concepts (dual space and subgradients), Eng Ung Choo in [2] proved that, in linear fractional vector maximum problems, every efficiency solution satisfies the requirements of a restricted concept of efficiency and the notion of proper efficiency. Wolf in [15, 16], describes a parametric approach for determining the optimal solution of the linear fractional programming problem. This approach provides the decision maker with additional