

Contents

- Notation 11**
- 1 Introduction 13**
 - 1.1 Context and Previous Work 15
- 2 Multicriteria Optimization 18**
 - 2.1 Basics and Optimality 18
 - 2.2 Scalarizations 20
 - 2.2.1 Weighted Sum Method 21
 - 2.2.2 ϵ -Constraint Method 23
 - 2.2.3 Pascoletti-Serafini Scalarization 24
 - 2.3 Pareto-Front Approximation 26
 - 2.3.1 Sandwiching 26
 - 2.4 Pareto-front Navigation 29
 - 2.4.1 Convex Navigation 30
 - 2.4.2 Non-Convex Navigation 31
- 3 Optimization Under Uncertainty 35**
 - 3.1 Worst-Case Optimization 36
 - 3.2 Robust Regret 40
 - 3.3 Inverse Robustness 40
- 4 Using Interval Matrices for Modelling Uncertainty 43**
 - 4.1 Definitions and Preliminaries 43
 - 4.2 The Duality Approach 48
 - 4.3 Comparison with Ben-Tal's Approach 51
- 5 Combination of Robust Multicriteria Optimization and Interval Matrices for LPs 56**
 - 5.1 Problem Formulation 57
 - 5.2 SDP-Relaxation 61

5.3	A Reconstruction Method for Solutions	67
5.4	Pareto-front Navigation	80
5.5	Application of Interval Matrices to the Robust Regret	81
5.6	Interval Matrices and Non-linear Functions	84
5.7	Discussion	86
6	Application to Practical Problems	88
6.1	The Diet Problem	88
6.2	The IMRT Problem	92
7	Conclusion	100
	Bibliography	103