Contents

Chapter 1. Introduction	7
Chapter 2. Preliminaries on majorization theory1. A discrete isoperimetric inequality2. Schur convexity of a class of symmetric functions	11 13 18
 Chapter 3. New results about majorization 1. A new weak majorization concept and the trees 2. Majorization on spaces with curved geometry 3. About spaces with global nonpositive curvature 4. The extension of Hardy-Littlewood-Pólya Theorem 5. The connection with Schur convexity 6. The case of Wasserstein space 	25 26 29 32 36 41 42
 Chapter 4. Relative convexity 1. A new concept of relative convexity 2. An Application to Mathematical Finance 3. The new concept of relative Schur-convexity 4. The Hardy-Littlewood-Pólya theorem of majorization 5. Relative Schur-convexity on global NPC spaces 	$\begin{array}{c} 45 \\ 45 \\ 55 \\ 56 \\ 58 \\ 61 \end{array}$
Chapter 5. Majorization results for trees1. Convex functions on K-spiders2. Popoviciu's inequality on K-spiders	65 66 69
 Chapter 6. Applications of majorization to elasticity 1. The 2-dimensional case of a logarithm inequality 2. The strict 3-dimensional case 3. A mathematical induction for the n-dimensional case 4. Further interesting energies inequalities results 5. A global minimizer result 	77 80 82 86 91 94
Chapter 7. Majorization and wireless communications1. Analysis of the Chernoff bound on the SER2. Optimality of binary power-control via majorization3. The network model and main results	99 100 103 104
Bibliography	107