
Contents

1	Introduction	1
2	Discrete Choice Models	11
2.1	Random Utility Models	11
2.1.1	Multinomial Logit	14
2.1.2	Generalized Extreme Value Models	16
2.1.3	Probit and Mixed Logit	23
2.2	Representative Agent Models	25
2.3	Semi-Parametric Choice Models	28
2.4	Other Choice Models	30
3	Discrete Choice Prox-Functions	35
3.1	Motivation	35
3.2	Convex Conjugate of Surplus Function	40
3.2.1	Continuity	40
3.2.2	Strong Convexity	42
3.2.3	Simplicity	57
3.2.4	Construction of Discrete Choice Prox-Functions	59
3.3	Convexity Parameter of Selected Prox-Functions	60
3.3.1	Convexity Parameter for GNL	60
3.3.2	Convexity Parameter for SPM	65
4	Consumption Cycle	75
4.1	Lancaster's Approach to Consumer Theory	76
4.2	Dual Averaging Scheme	78

4.3	Consumption Cycle	79
4.4	Primal-Dual Consumption Cycle	83
5	Network Manipulation	89
5.1	Introduction	89
5.2	Manipulation Model	91
5.2.1	Interaction Network	92
5.2.2	Agents	93
5.2.3	Organizations	96
5.2.4	Network Manipulation Algorithm	98
5.3	Inexact Alternating Minimization	100
5.4	Convergence Analysis	109
5.5	Computational Aspects	117
5.5.1	Agent's Subproblem	117
5.5.2	Organization's Subproblem	119
5.6	Numerical Examples	121
6	Dynamic Pricing	129
6.1	Introduction	129
6.2	Demand	132
6.3	Supply	138
6.4	Market Clearing	140
6.5	Deterministic Dynamics	144
6.6	Stochastic Dynamics	149
7	Conclusion and Perspectives	155
	Bibliography	157