Optimization

Pieter Vanderschueren

Year 2024-2025

## Contents

Funda	mental Concepts	<b>2</b>
1	Fundamental Concepts of Optimization	3
2	Types of Optimization Problems	4
3	Convex Optimization	5
4	The Lagrangian Function and Duality	6
Uncon	strained Optimization Algorithms	7
5	Optimality Conditions	8
6	Estimation and Fitting Problems	9
7	Newton Type Optimization	10
8	Globalisation Strategies	11
9	Calculating Derivatives	12
Constr	rained Optimization Algorithms	13
10	Optimality Conditions for Constrained Optimization	14
11	Equality Constrained Optimization Algorithms	15
12	Inequality Constrained Optimization Algorithms	16
13	Optimal Control Problems	17

Fundamental Concepts

1 Fundamental Concepts of Optimization

2 Types of Optimization Problems

3 Convex Optimization

4 The Lagrangian Function and Duality

Unconstrained Optimization Algorithms

5 Optimality Conditions

6 Estimation and Fitting Problems

7 Newton Type Optimization

8 Globalisation Strategies

9 Calculating Derivatives

Constrained Optimization Algorithms

10 Optimality Conditions for Constrained Optimization

11	Equality Constrained Optimization Algorithms	

12 Inequality Constrained Optimization Algorithms

13 Optimal Control Problems