

编号: 2024-3-1145141919

级别: 公开

# 优化基本理论与方法课程研究报告

## Optimal Transport Based Distributed Optimization Research

(2024 年 1 月)

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## **Abstract**



## 1 Introduction

### 1.1 Background

### 1.2 Contributions

### 1.3 Organization

## 2 相关工作

## 3 问题描述和常用记号

### 3.1 BFGS 算子与算法

### 3.2 Greedy-BFGS 算法

## 4 方法描述

### 4.1 二次规划

### 4.2 一般的强凸光滑场景

## 5 理论结果

## 6 实验结果

## 7 问题分析与挑战

## 8 总结

## Reference

- [1] COLIN I, BELLET A, SALMON J, et al. Gossip dual averaging for decentralized optimization of pairwise functions[C]//International Conference on Machine Learning. 2016: 1388-1396.
- [2] DAVIS D. Convergence rate analysis of primal-dual splitting schemes[J]. SIAM Journal on Optimization, 2015, 25(3):1912-1943.

- [3] DEFAZIO A. A simple practical accelerated method for finite sums[C]//Advances in Neural Information Processing Systems. 2016: 676-684.
- [4] EISEN M, MOKHTARI A, RIBEIRO A. Decentralized quasi-Newton methods[J]. IEEE Transactions on Signal Processing, 2017, 65(10):2613-2628.
- [5] NESTEROV Y. Introductory lectures on convex optimization: A basic course: volume 87[M]. Springer Science & Business Media, 2013.
- [6] WU T, YUAN K, LING Q, et al. Decentralized consensus optimization with asynchrony and delays[C]//Signals, Systems and Computers, 2016 50th Asilomar Conference on. IEEE, 2016: 992-996.