



UNIVERSITÉ
DE GENÈVE

Université de Genève

Faculty of Science

Department of Computer Science

Your Thesis Title Here

Master Thesis

presented by

Viktor Shcherbakov

Machine Learning Group

Supervisor:

Prof. François Fleuret

Geneva, January 19, 2026

To my family and friends.

Acknowledgments

I would like to express my sincere gratitude to my supervisor, Prof. François Fleuret, for his guidance, patience, and unwavering support throughout this project. His willingness to engage in open discussions and his flexibility during the many shifts in research direction were invaluable to the completion of this work.

I am equally grateful to Prof. Martin Jaggi for hosting me at the Machine Learning and Optimization (MLO) laboratory at EPFL during my academic exchange. His insightful discussions and constructive feedback significantly shaped the direction of this thesis. I also wish to thank the members of the MLO lab for the productive discussions following my presentation of this work, which helped refine many of the ideas presented here.

The supportive and collaborative environment provided by both professors made navigating the challenges of this research a rewarding experience. *Geneva, January 19, 2026* Viktor Shcherbakov

Abstract

[Write your abstract here. The abstract should provide a concise summary of your thesis, including the problem addressed, the methodology used, the main results, and the conclusions drawn.]

Résumé

[Ecrivez votre resume ici. Le resume doit fournir un apercu concis de votre these, incluant le probleme aborde, la methodologie utilisee, les resultats principaux et les conclusions tirees.]

Contents

Acknowledgments	1
Abstract	2
Résumé	3
List of Figures	6
List of Tables	7
1 Introduction	8
1.1 Context and Motivation	8
1.2 Problem Statement	8
1.3 Research Questions	8
1.4 Contributions	8
1.5 Thesis Outline	8
2 Background	10
2.1 Theoretical Foundations	10
2.2 Key Concepts	10
2.3 Technical Preliminaries	10
2.4 Summary	10
3 Related Work	11
3.1 Overview	11
3.2 Category 1	11
3.3 Category 2	11
3.4 Comparison with This Work	11
3.5 Summary	11
4 Methodology	12
4.1 Overview	12
4.2 Problem Formulation	12

4.3	Proposed Approach	12
4.3.1	Component 1	12
4.3.2	Component 2	12
4.4	Implementation Details	12
4.5	Summary	12
5	Experiments	13
5.1	Experimental Setup	13
5.1.1	Datasets	13
5.1.2	Baselines	13
5.1.3	Evaluation Metrics	13
5.2	Implementation Details	13
5.2.1	Hardware and Software	13
5.2.2	Hyperparameters	13
5.3	Evaluation Protocol	13
5.4	Summary	13
6	Results	14
6.1	Main Results	14
6.2	Comparison with Baselines	14
6.3	Ablation Studies	14
6.4	Qualitative Analysis	14
6.5	Summary	14
7	Discussion	15
7.1	Interpretation of Results	15
7.2	Limitations	15
7.3	Broader Implications	15
7.4	Summary	15
8	Conclusion	16
8.1	Summary of Contributions	16
8.2	Future Work	16
8.3	Concluding Remarks	16
	Bibliography	17
A	Supplementary Material	17
A.1	Additional Experimental Results	17
A.2	Proofs	17
A.3	Implementation Details	17

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Context and Motivation

1.2 Problem Statement

1.3 Research Questions

1.4 Contributions

1.5 Thesis Outline

The remainder of this thesis is organized as follows:

Chapter 2 presents the theoretical background and foundational concepts necessary to understand this work.

Chapter 3 reviews related work and positions this thesis within the existing literature.

Chapter 4 describes the proposed methodology and approach.

Chapter 5 details the experimental setup and evaluation protocol.

Chapter 6 presents the experimental results.

Chapter 7 discusses the findings, limitations, and implications.

Chapter 8 concludes the thesis and suggests directions for future work.

Chapter 2

Background

2.1 Theoretical Foundations

2.2 Key Concepts

2.3 Technical Preliminaries

2.4 Summary

Chapter 3

Related Work

3.1 Overview

3.2 Category 1

3.3 Category 2

3.4 Comparison with This Work

3.5 Summary

Chapter 4

Methodology

4.1 Overview

4.2 Problem Formulation

4.3 Proposed Approach

4.3.1 Component 1

4.3.2 Component 2

4.4 Implementation Details

4.5 Summary

Chapter 5

Experiments

5.1 Experimental Setup

5.1.1 Datasets

5.1.2 Baselines

5.1.3 Evaluation Metrics

5.2 Implementation Details

5.2.1 Hardware and Software

5.2.2 Hyperparameters

5.3 Evaluation Protocol

5.4 Summary

Chapter 6

Results

6.1 Main Results

6.2 Comparison with Baselines

6.3 Ablation Studies

6.4 Qualitative Analysis

6.5 Summary

Chapter 7

Discussion

7.1 Interpretation of Results

7.2 Limitations

7.3 Broader Implications

7.4 Summary

Chapter 8

Conclusion

8.1 Summary of Contributions

8.2 Future Work

8.3 Concluding Remarks

Appendix A

Supplementary Material

A.1 Additional Experimental Results

A.2 Proofs

A.3 Implementation Details