UNIVERSITÀ DI BOLOGNA

School of Engineering

Master Degree in Automation Engineering

Distributed Autonomous Systems

TITLE

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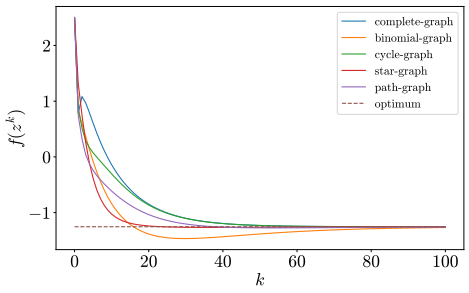
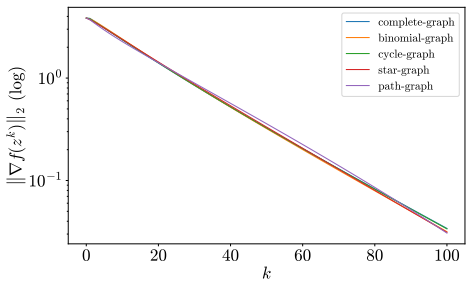
1.1 Gradient tracking with quadratic functions

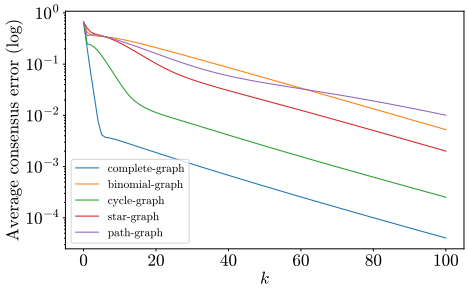
1.1.1 Different graph patterns comparison



(a) Cost evolution

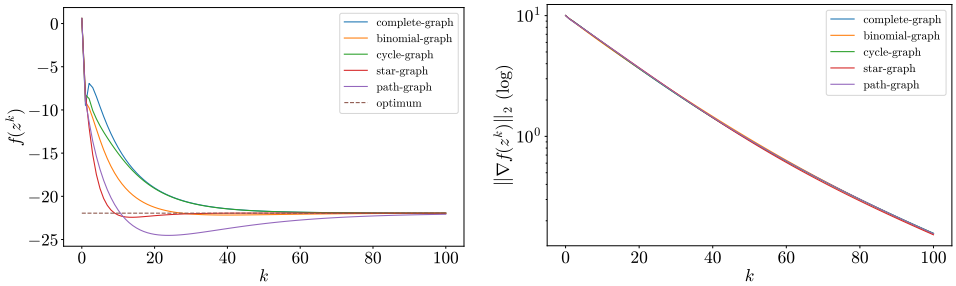


(b) Gradient norm evolution



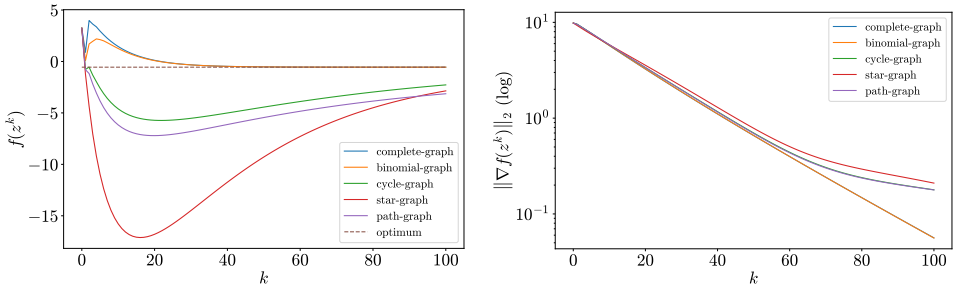
(c) Consensus error

Figure 1.1: Configuration with 5 agents in $\mathbb{R}^3$



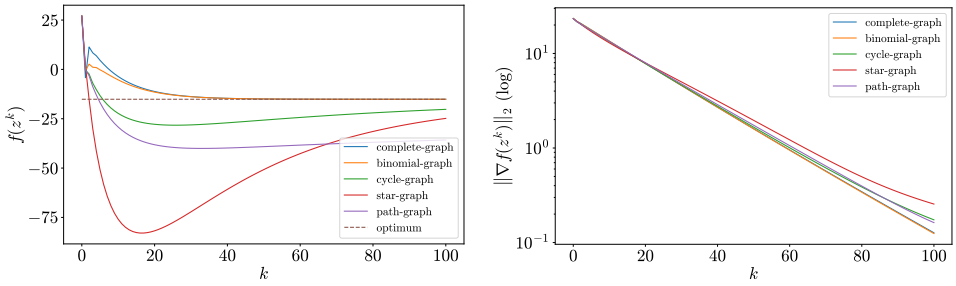
(a) Cost evolution (b) Gradient norm evolution

Figure 1.2: Configuration with 5 agents in $\mathbb{R}^{15}$



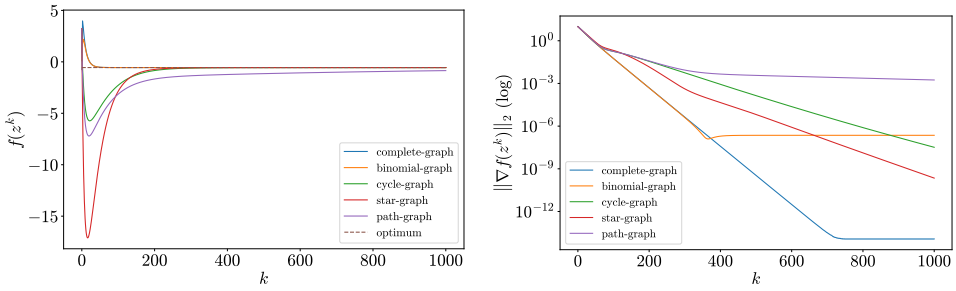
(a) Cost evolution (b) Gradient norm evolution

Figure 1.3: Configuration with 15 agents in $\mathbb{R}^3$



(a) Cost evolution (b) Gradient norm evolution

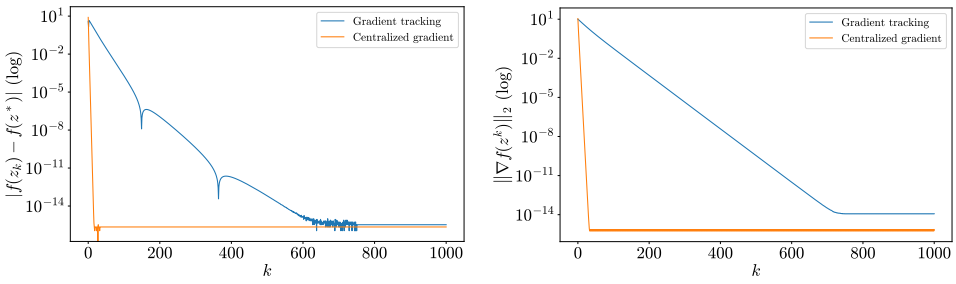
Figure 1.4: Configuration with 15 agents in $\mathbb{R}^{15}$



(a) Cost evolution (b) Gradient norm evolution

Figure 1.5: Configuration with 15 agents in $\mathbb{R}^3$ to convergence

1.1.2 Comparison with centralized gradient

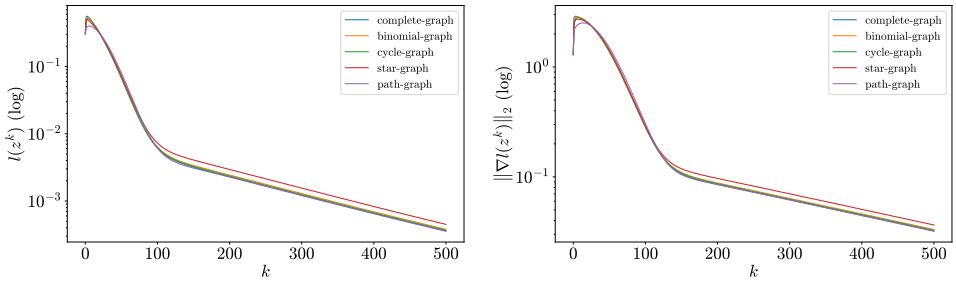


(a) Distance to optimum (b) Gradient norm evolution

Figure 1.6: Configuration with 15 agents in $\mathbb{R}^3$ compared to centralized gradient

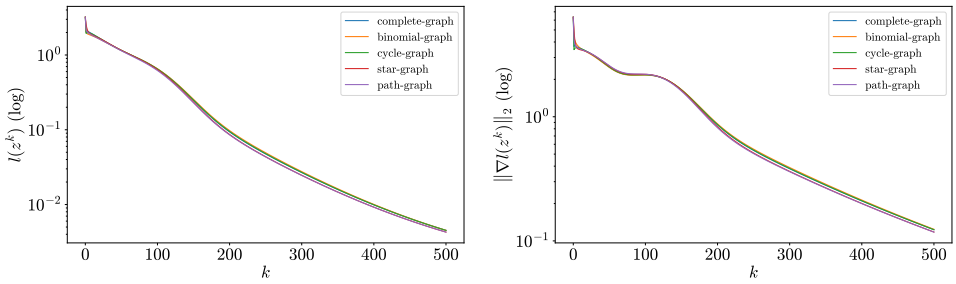
1.2 Cooperative multi-robot target localization

1.2.1 Different graph patterns comparison



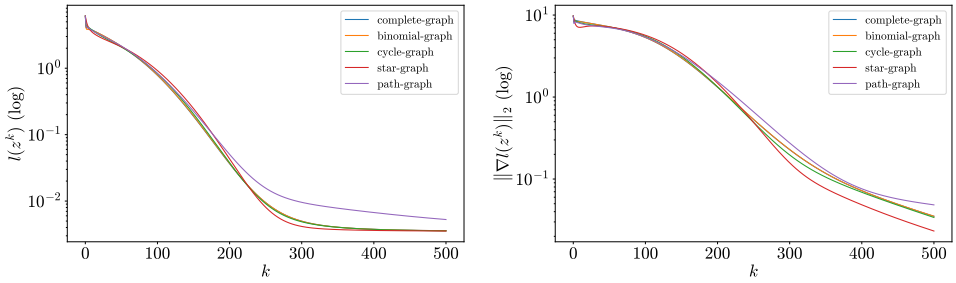
(a) Loss evolution (b) Gradient norm evolution

Figure 1.7: Configuration with 5 robots and 1 target



(a) Loss evolution (b) Gradient norm evolution

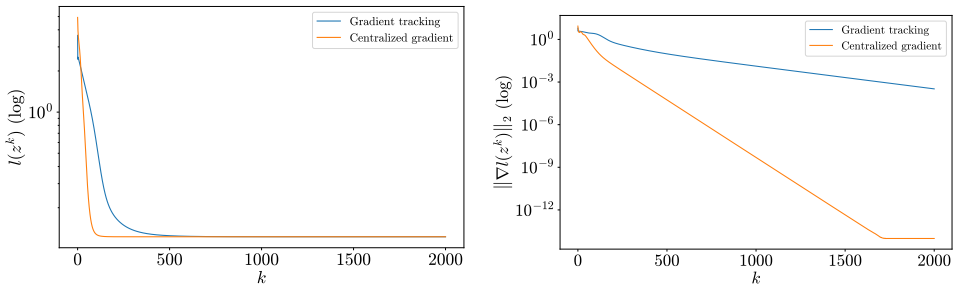
Figure 1.8: Configuration with 5 robots and 3 targets



(a) Loss evolution (b) Gradient norm evolution

Figure 1.9: Configuration with 15 robots and 3 targets

1.2.2 Comparison with centralized gradient



(a) Loss evolution (b) Gradient norm evolution

Figure 1.10: Configuration with 5 robots and 3 targets with centralized gradient

1.2.3 Different noises

Chapter 2

Aggregative Optimization for Multi-Robot Systems

Conclusions

Bibliography