2 PORTFOLIO INTRODUCTION : COMBINATORIAL OPTIMIZATION, ALGORITHMS TEAM

The portfolio of Team 2 comprises 5 elements. The first two rely on research articles published in highly selective conferences and journals. They reflect the kind of theoretical research conducted within AGAPE and MATHIS. The third element of the portfolio deals with an international conference launched by members of Team 2. The fourth element of the portfolio witnesses the investment of Team 2 in putting algorithms into practice. The fifth element describes how Team 2 paid tribute to one of his beloved and influential member who untimely passed away.

AGAPE publications on Twin-width

Twin-width is a new width measure we introduced in 2020 [1, 6]. In a series of follow-up works [2, 3, 4, 5, 7] we demonstrated that twin-width is a powerful as well as very natural tool which has rich structure and applications. Since the first introduction of twin-width, there is a rapidly expanding literature, including 30+ articles, which reveals its importance in various sub-fields of computer science.

MATHIS publication on graphs

In 2021, a member of Team 2 disproved the following important conjecture in graph theory which has its roots in information theory [48].
[The Normal Graph Conjecture (1999)] A graph with no C_5, C_7 and $\overline{C_7}$ as induced subgraph is normal.
The proof is probabilistic and in fact shows that most “sparse” graphs (with a certain edge-density) are counterexamples. Unfortunately, these graphs are so large that one cannot actually display a counterexample.

International Symposium on Combinatorial Optimization (ISCO)

ISCO is a biennial international symposium whose aim is to bring together researchers from all the communities related to combinatorial optimization. Each edition is preceded or followed by a Spring School. Articles of ISCO are selected by a program committee on the basis of 12-page submissions, and proceedings are published by Springer LNCS. Selected articles are also published in extended versions in special issues of international journals. Two members of Team 2 are in the steering committee of ISCO. They participated in the launch of the conference (2010) and its seven editions.

Parameterized Algorithms and Computational Experiments Challenge (PACE)

PACE was conceived to deepen the relationship between parameterized algorithms and practice. It aims at bridge the divide between the theory of algorithm design and the practice of algorithm engineering, by providing open-source and available implementations (on public repositories with a DOI) and benchmark instances and inspiring new theoretical developments. Each year, one or two (theoretical) problems are selected as well as benchmark instances, and the challenge consists in producing efficient algorithms for these problems. We participated to this challenge two times, co-designed the challenge in 2018 and took part to the Steering Committee.

Tribute to Jérôme Monnot

Jérôme Monnot was member of Team 2 (DR CNRS) until his untimely death on December 11, 2019. A tribute to his scientific contribution has been paid, composed of a special issue of the journal *Theoretical Computer Science*, an international conference held in December 2021 at the university of Paris-Dauphine, and an article published in the journal of the *Société Informatique de France*.