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## The twin-width of powers of graphs with bounded tree-width

Mauricio Yépez\*

Instituto de Ingeniería Matemática-CIMFAV  
Universidad de Valparaíso

### Abstract

Twin-width is a new graph parameter introduced by Bonnet, Kim, Thomassé and Watrigant [1]. Graphs classes with bounded twin-width include those with bounded tree-width, clique-width, and also planar graphs and proper minor-closed classes. Moreover, they preserve most of the nice algorithmic properties of clique-width.

In this work, we study the twin-width of power of graphs with bounded tree-width. This is known to be bounded but existing bounds are implicit and very large [1]. We provide a bound of  $k$  for the twin-width of the  $k$ -th power of any tree and show that this bound is tight. We also show that if  $G$  has tree-width at most  $t$ , then the twin-width of the  $k$ -th power of  $G$  is at most  $3 \cdot 2^{k-t-1}$ .

Trabajo realizado junto a:

Henry Echeverría<sup>1</sup>, Andrea Jiménez<sup>2</sup> y Daniel A. Quiroz<sup>3</sup>.

### References

- [1] ÉDOUARD BONNET, EUN JUNG KIM, STÉPHAN THOMASSÉ, AND RÉMI WATRIGANT, *Twin-width I: tractable FO model checking*, Journal of the ACM **69**(1):1–46, 2021.

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<sup>2</sup>Parcialmente financiado por ANID/Fondecyt Regular 1220071, Programa Regional MATH-AMSUD MATH210008, e-mail: andrea.jimenez@uv.cl

<sup>3</sup>Parcialmente financiado por ANID/FONDECYT Iniciación en Investigación Grant 11201251, e-mail: daniel.quiroz@uv.cl

Instituto de Ingeniería Matemática-CIMFAV, Universidad de Valparaíso