# **Assessing the Existence of a Function in a Dataset with the g<sub>3</sub> Indicator** *hardness, algorithmics and visualization*

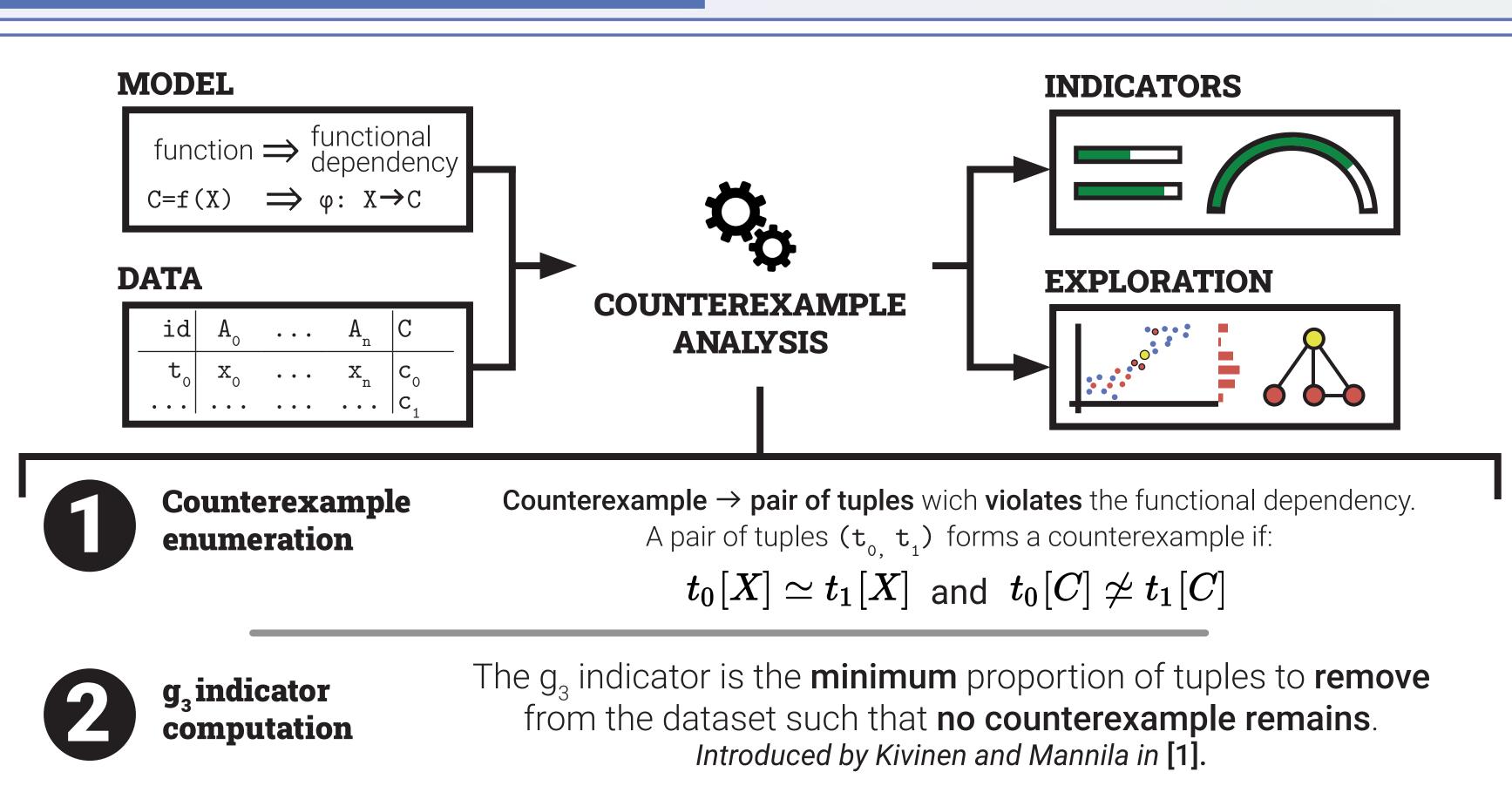
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- INTRODUCTION		<b>REFERENCES</b> [1] Kivinen et al. 1995. Approximate inference of functional dependencies from relations. Theoretical Computer Science.
	How to measure the <b>veracity</b> of a <b>function</b> in a <b>dataset</b> ?	<ul> <li>[2] Delbot et al. 2010. Analytical and experimental comparison of six algorithms for the vertex cover problem. Journal of Experimental Algorithmics.</li> <li>[3] Onak et al. 2012. A near-optimal sublinear-time algorithm for approximating the minimum vertex cover size. ACM-SIAM symposium on Discrete Algorithms.</li> </ul>
physical system dataset $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$ $\downarrow$	functional dependencies, counterexamples, g <sub>3</sub> indicator	<ul> <li>[4] Song et al. 2013. Comparable dependencies over heterogeneous data. International Journal on Very Large Data Bases.</li> <li>[5] Cai et al. 2013. NuMVC: An efficient local search algorithm for minimum vertex cover. Journal of Artificial Intelligence Research.</li> </ul>
	<ul> <li>Research subjects</li> <li>hardness of this problem</li> <li>techniques for scalable computation</li> <li>dataset exploration in view of a function</li> </ul>	<ul> <li>[6] Hespe et al. 2020. WeGotYouCovered: The Winning Solver from the PACE 2019 Challenge. SIAM Workshop on Combinatorial Scientific Computing.</li> <li>[7] Le Guilly et al. 2020. Evaluating Classification Feasibility Using Functional Dependencies. Transaction on Large-Scale Data- and Knowledge-Centered Systems.</li> </ul>
		<ul> <li>[8] FaureGiovagnoli et al. 2021. ADESIT: Visualize the Limits of your Data in a Machine Learning Process. International Conference on Very Large Data Bases.</li> <li>[9] FaureGiovagnoli et al. 2022. Assessing the Existence of a Function in your Dataset with the g<sub>3</sub> Indicator.</li> </ul>

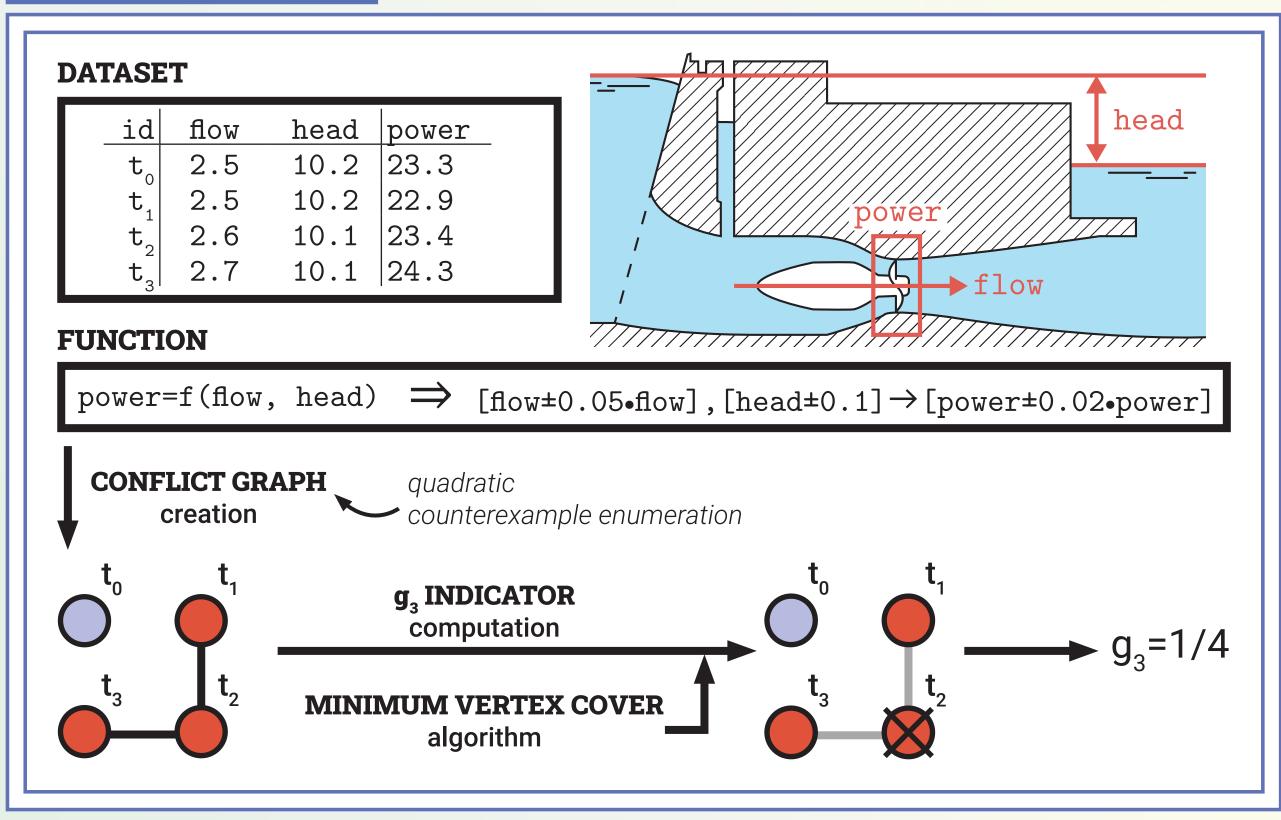
#### COUNTEREXAMPLE ANALYSIS



IEEE International Conference on Data Engineering.

**[10]** Vilmin et al. 2022. Functional dependencies with predicates: what makes the g3-error easy to compute? BDA conference.

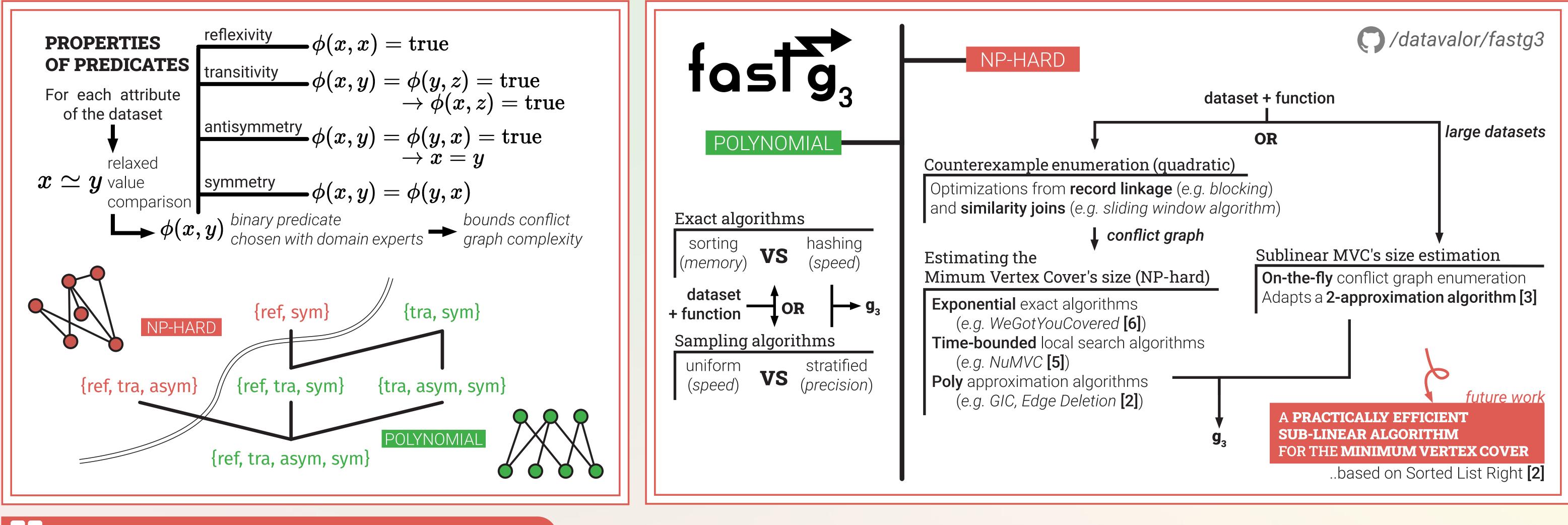
# **EXAMPLE**



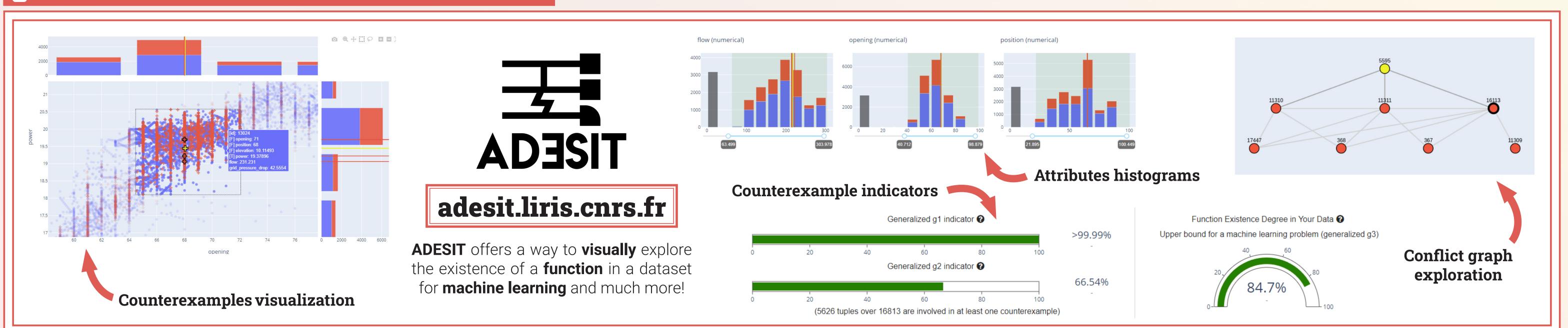
 $1-g_3$  is also the maximum accuracy of any model in the case of classical functional dependencies [7].

## HARDNESS ANALYSIS [10]

### COMPUTE WITH THE FASTG3 PYTHON LIBRARY [9]



#### + VISUALIZE WITH THE ADESIT WEB APP [8]



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