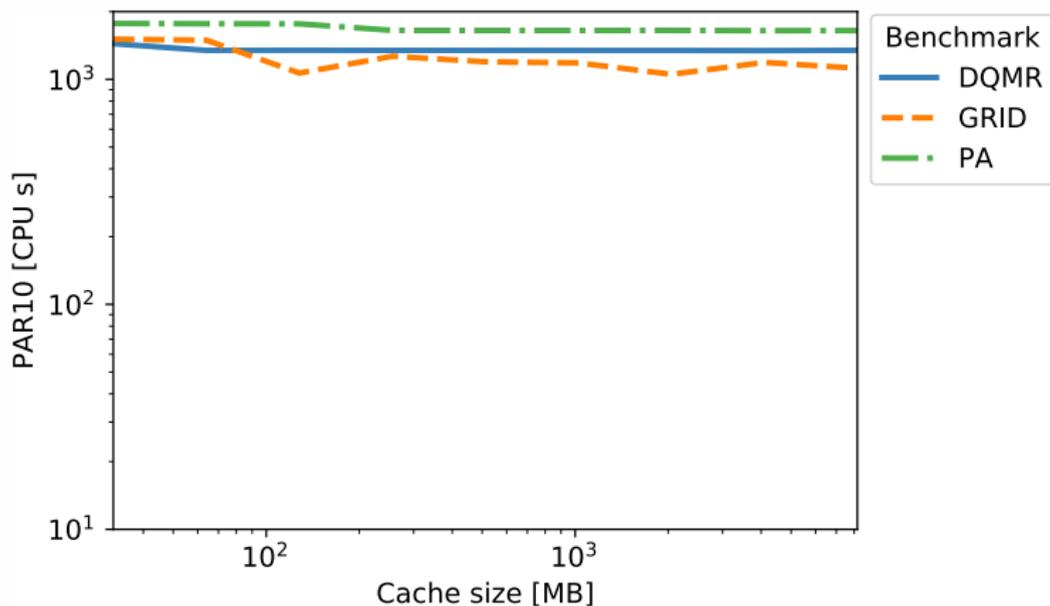# Caching in Model Counters:
A Journey through Space and Time

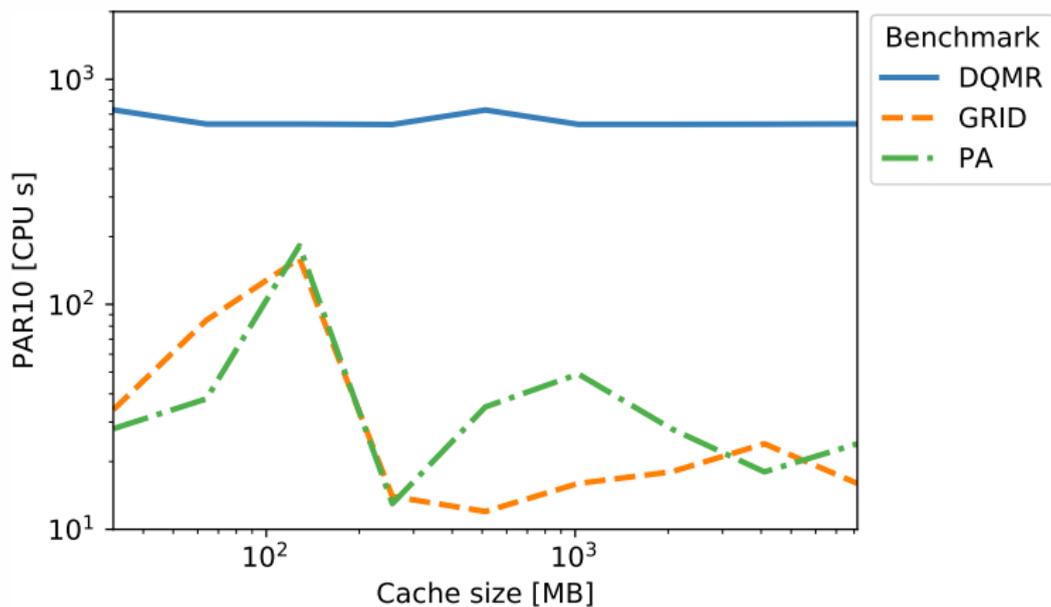**Jeroen Rook**, Anna Latour, Holger H. Hoos and Siegfried Nijssen.

Universiteit
Leiden
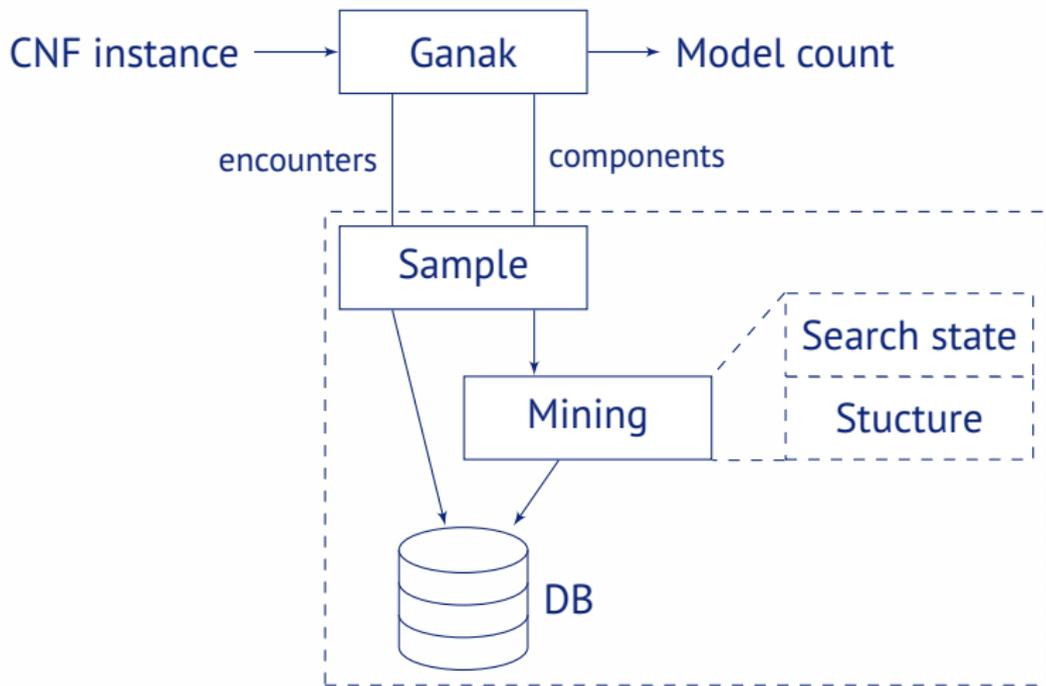**The Netherlands**

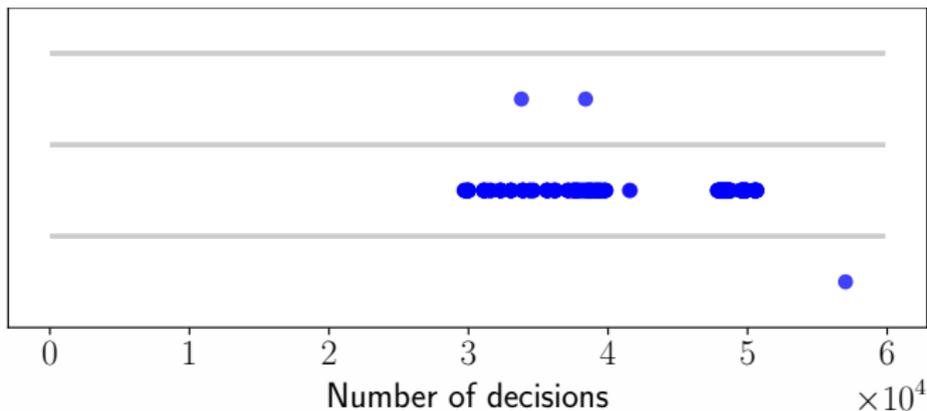# Effect of cache size limit

Effect of cache size limit

What is the effect of branching heuristics and
cache management schemes on caching behaviour?
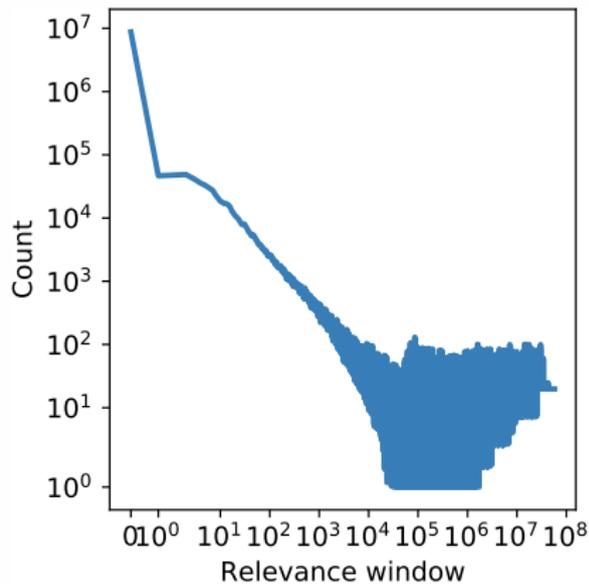
Approach
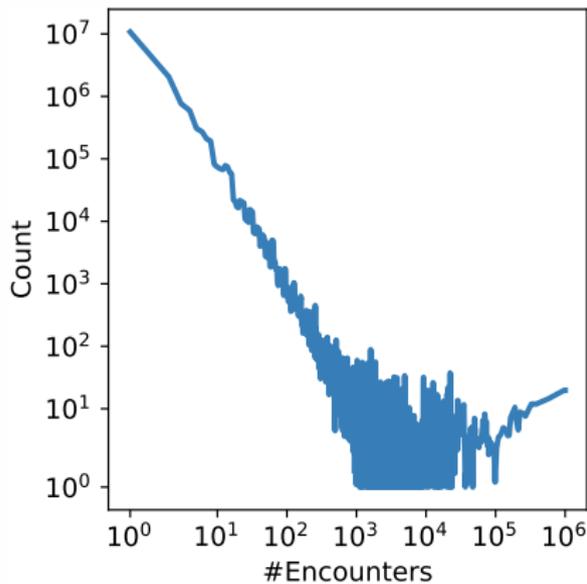**Inspired by** CrystalBall **[SKM19]**

Relevance measures
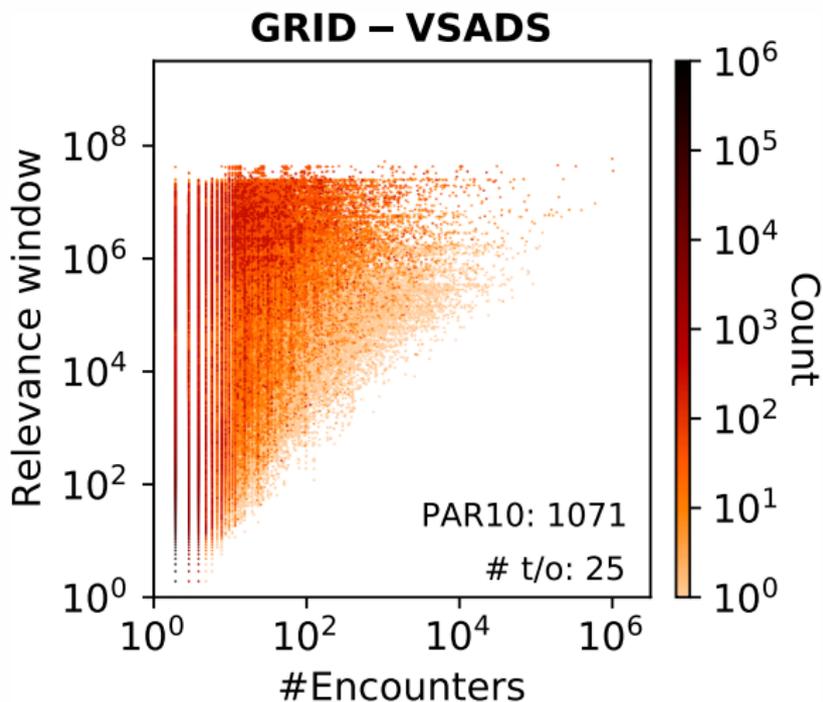

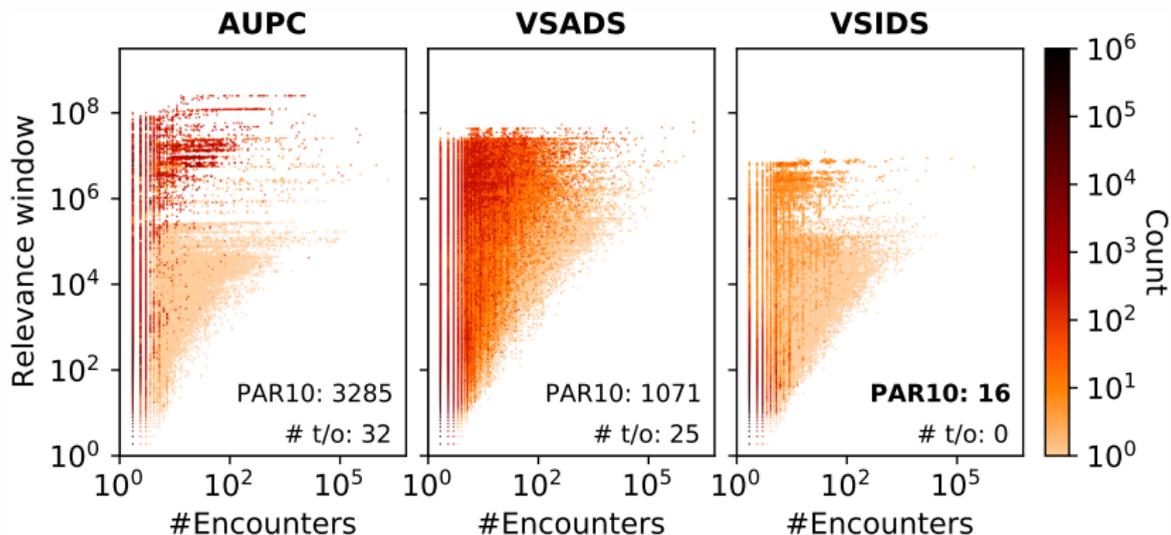**#Encounters**   **Relevance window**

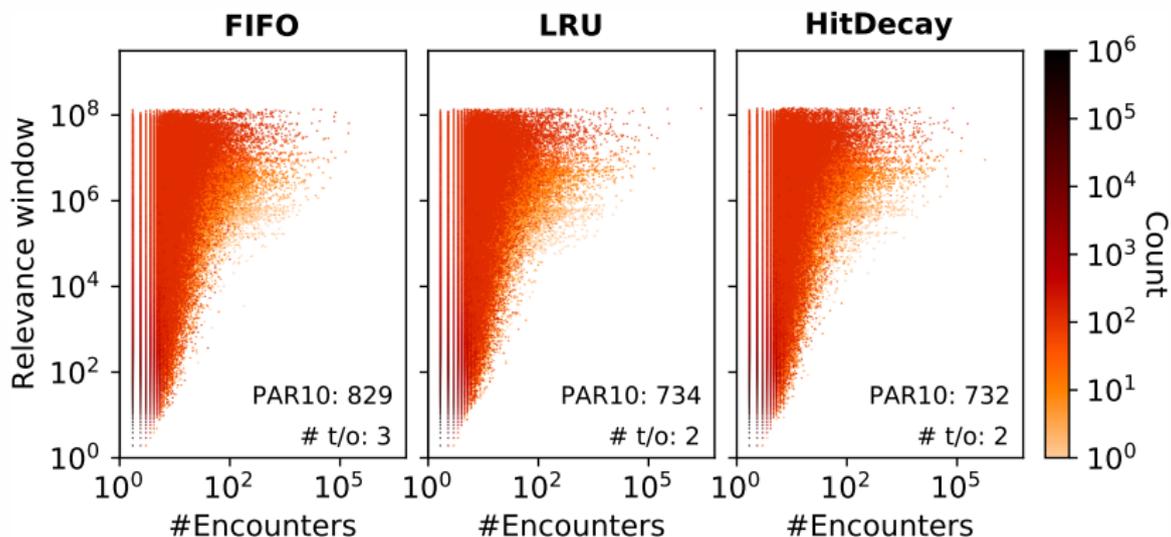# Relevance measure distributions

Relevance measure heatmaps

Caching behaviour for branching heuristics

Caching behaviour for caching schemes

Future work

- Caching behaviour under symmetric component caching [vBDS+21]
- New caching schemes based on caching behaviour.
  - Based on component characteristics.
  - Adaptive thresholds

Take aways

- Trade-off between space and time in DPLL-style model counters is small.
- Good branching heuristics yield small search trees and shortly relevant components.
- How low can we go?

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References I

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Crystalball: Gazing in the black box of SAT solving.
In *SAT*, volume 11628 of *Lecture Notes in Computer Science*, pages 371–387.
Springer, 2019.

Timothy van Bremen, Vincent Derkinderen, Shubham Sharma, Subhajit Roy,
and Kuldeep S. Meel.
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In *AAAI*, pages 3922–3930. AAAI Press, 2021.