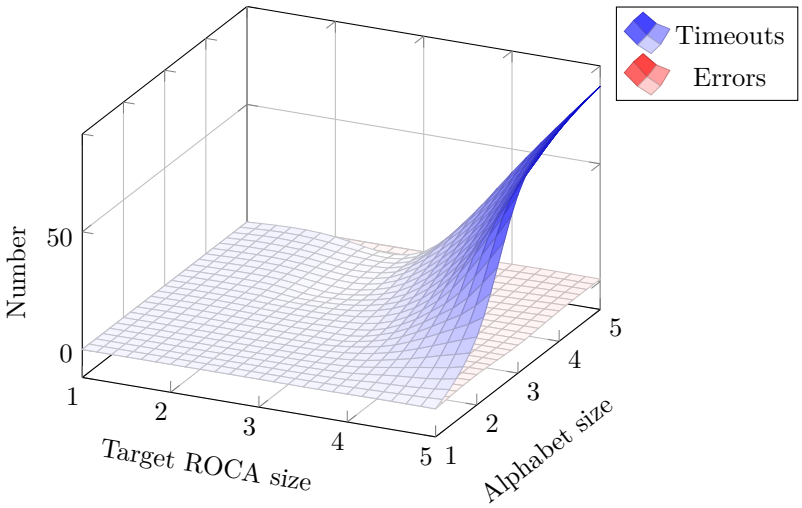
1 Experiments

- 16GB of RAM.
- Maximum 2 minutes.
- See paper for CPU specifications.

2 Timeouts and errors

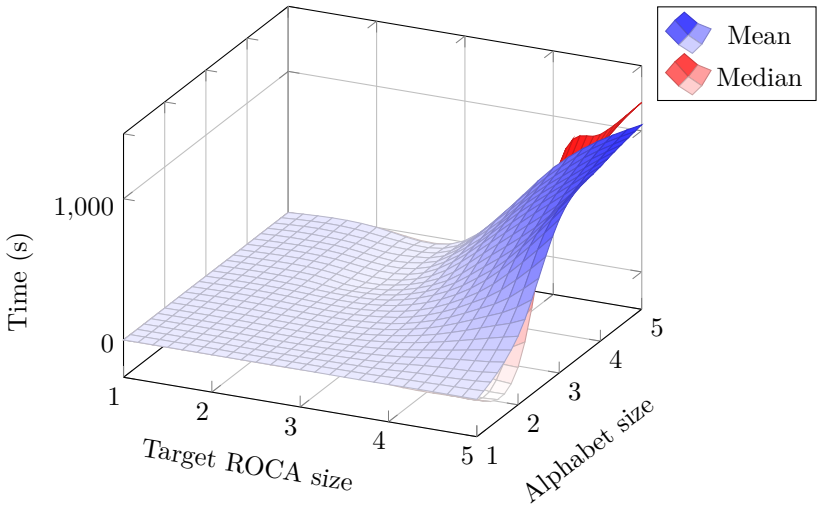


Target ROCA size	Alphabet size	Timeouts	Errors
1	1	0	0
1	2	0	0
1	3	0	0
1	4	0	0
1	5	0	0
2	1	0	0
2	2	0	0
2	3	0	0
2	4	0	0
2	5	0	0
3	1	0	0
3	2	0	0
3	3	0	0
3	4	0	0
3	5	0	0
4	1	0	0
4	2	4	0
4	3	13	0
4	4	27	0
4	5	40	1
5	1	0	0
5	2	17	1
5	3	64	0
5	4	78	1
5	5	83	1

3 Times

3.1 Total time

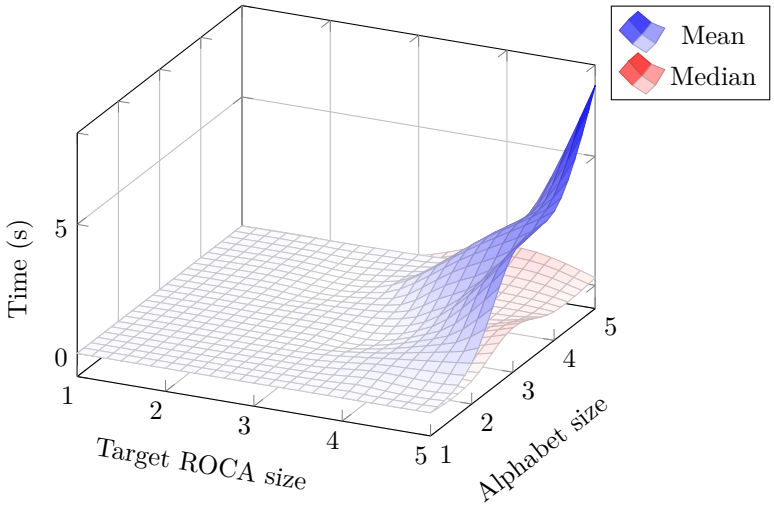
Time from start to finish. If a timeout is reached, the value is replaced by *two minutes* (i.e., the time limit).



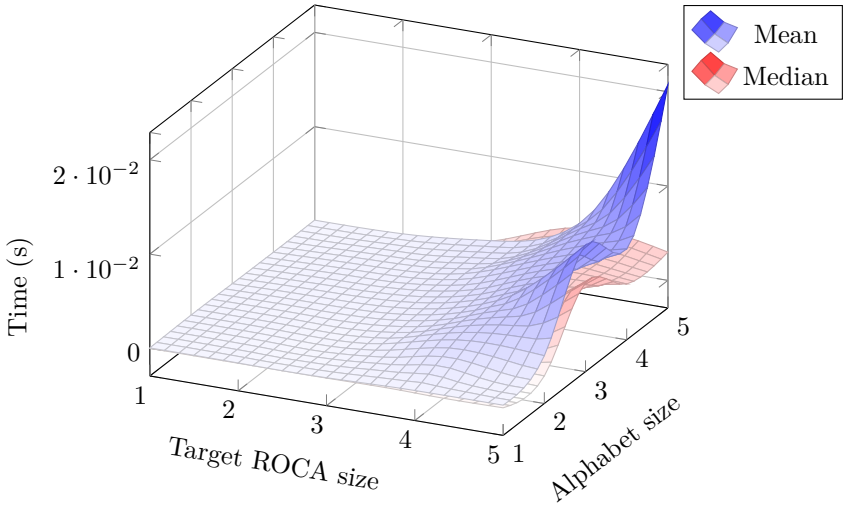
3.2 Counterexample time

Time to *find* a counterexample, i.e., time taken by the equivalence oracles. From now on (until the end of the document), runs that ended up in a timeout are removed from the dataset.

3.2.1 ROCA

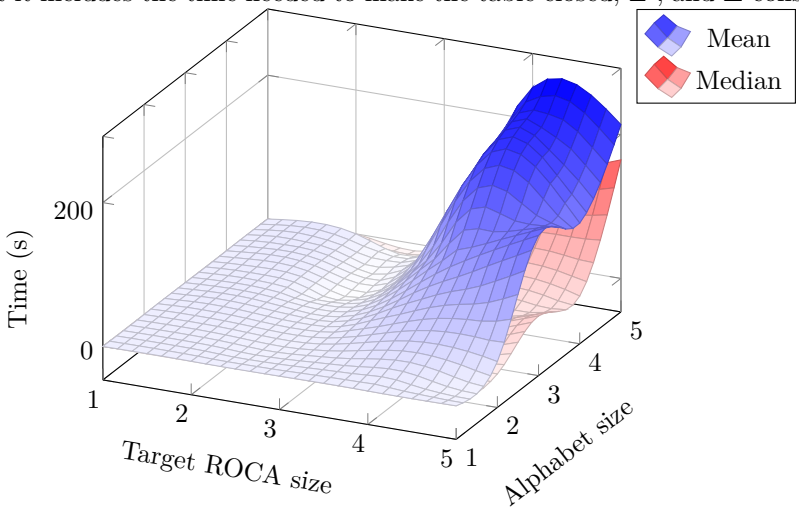


3.2.2 DFA

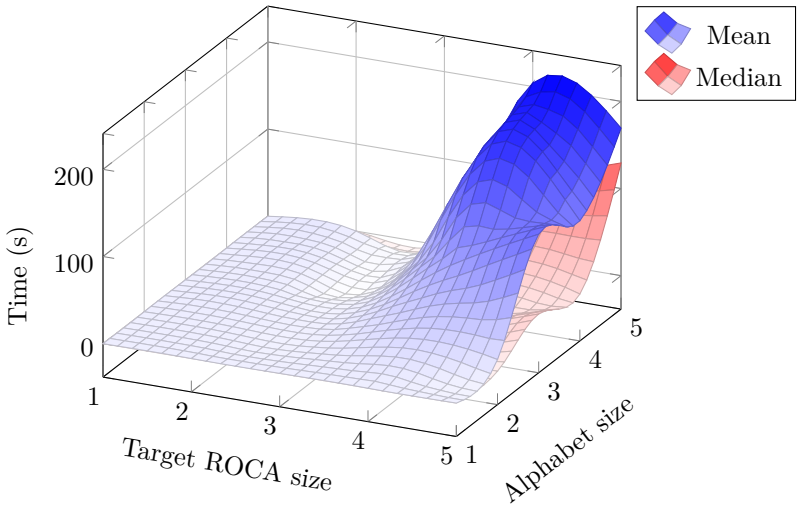


3.3 Learning a DFA for a fixed counter limit

Time to refine the table using an equivalence query's counterexample. Note that it includes the time needed to make the table closed, Σ-, and $\perp$-consistent.

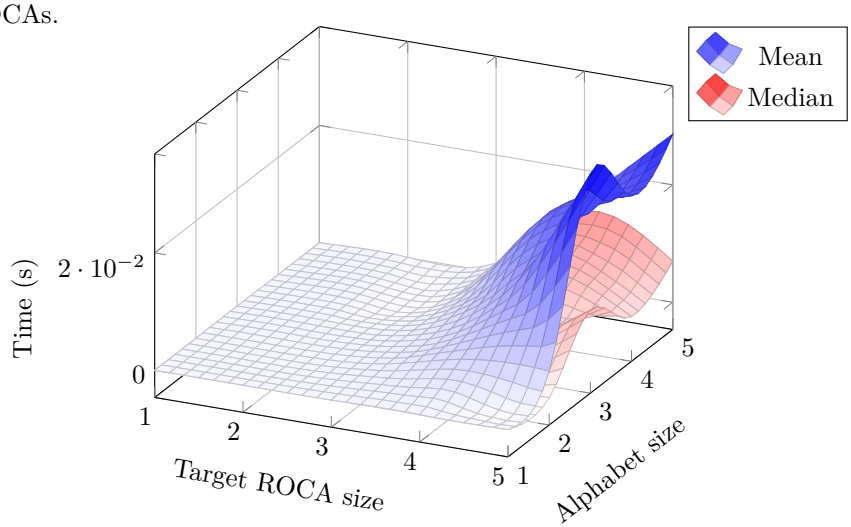


3.4 Making table closed, Σ-, and ⊥-consistent



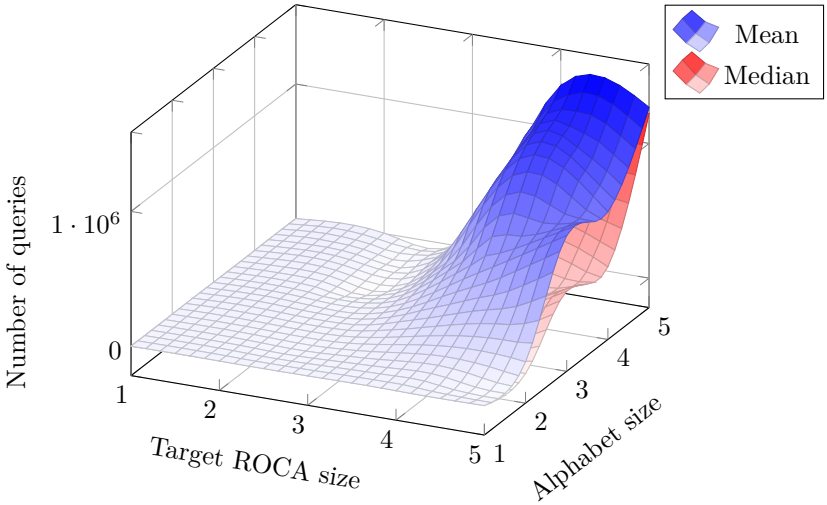
3.5 Computing periodic descriptions

Time to find the periodic descriptions AND to construct the corresponding ROCAs.

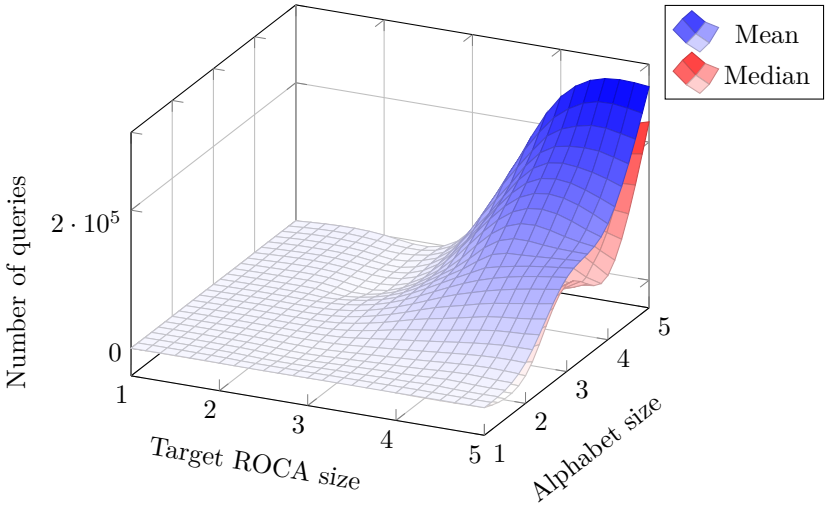


4 Number of queries

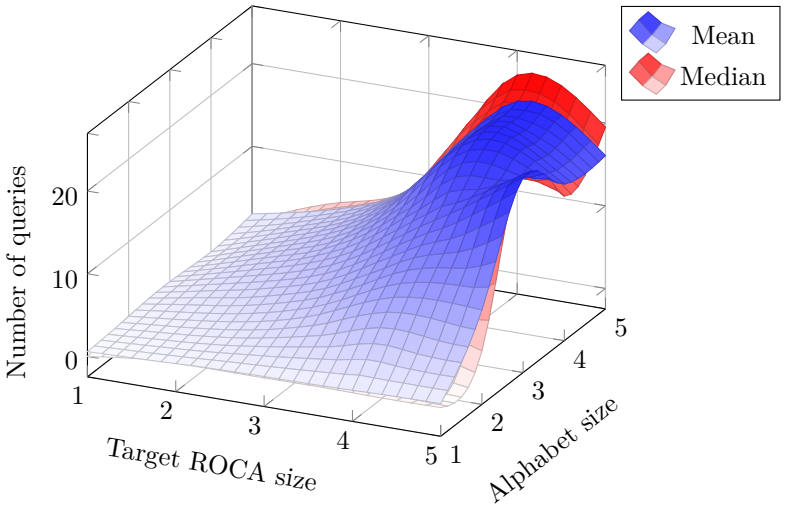
4.1 Membership queries



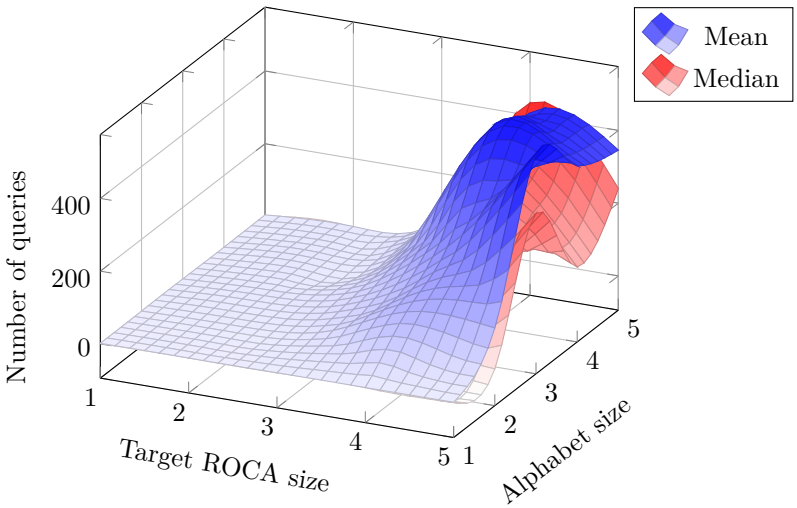
4.2 Counter value queries



4.3 Partial equivalence queries

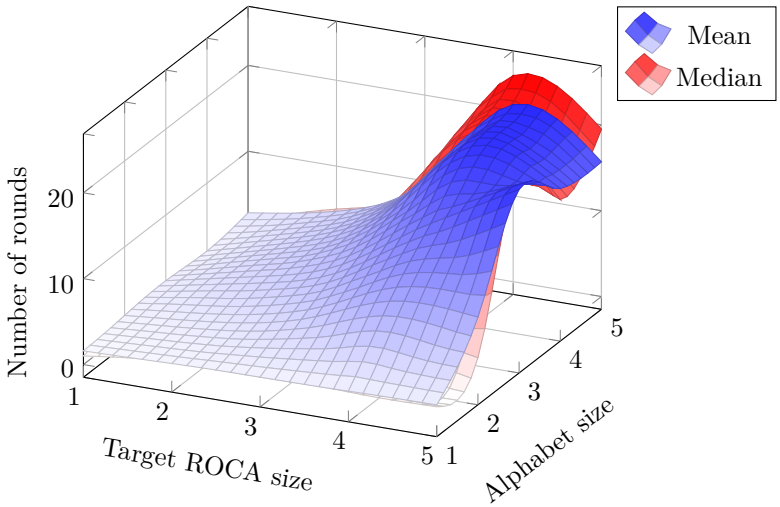


4.4 Equivalence queries



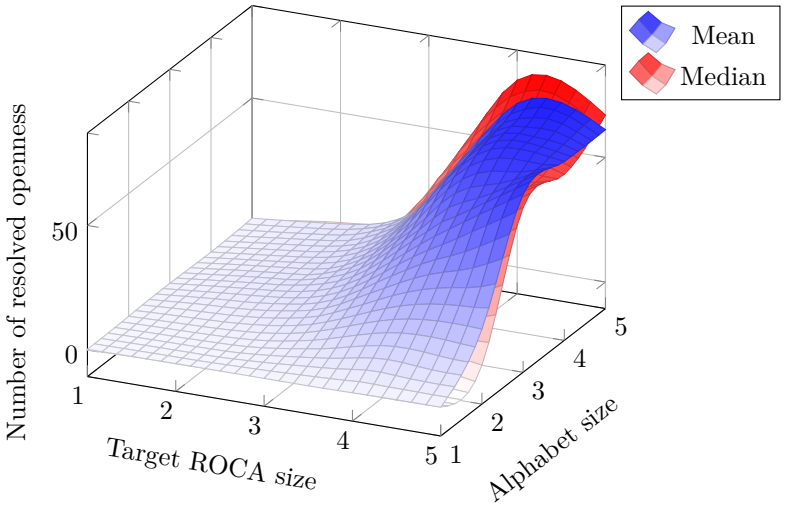
5 Number of rounds

Equivalent to number of processed ROCA counterexamples + 1.

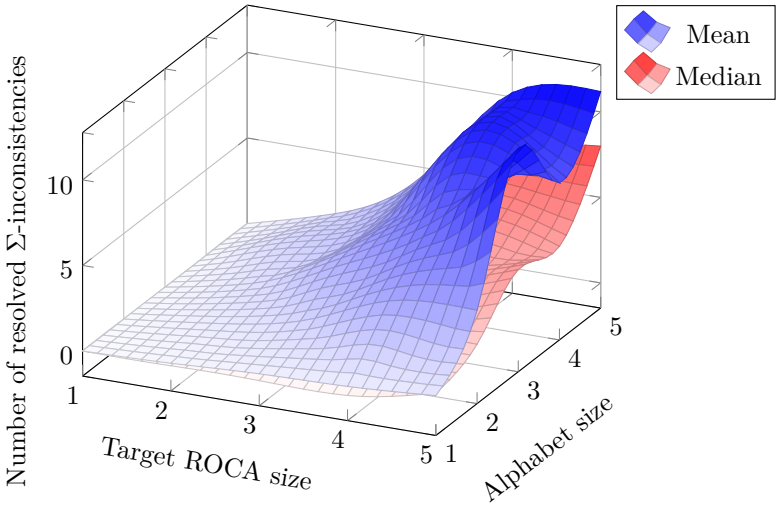


6 Number of operations to make the table nice

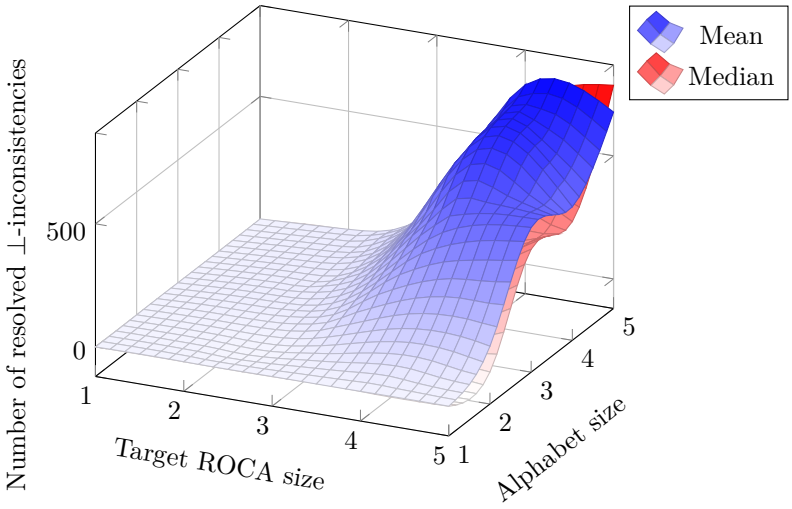
6.1 Openness



6.2 Σ-inconsistencies

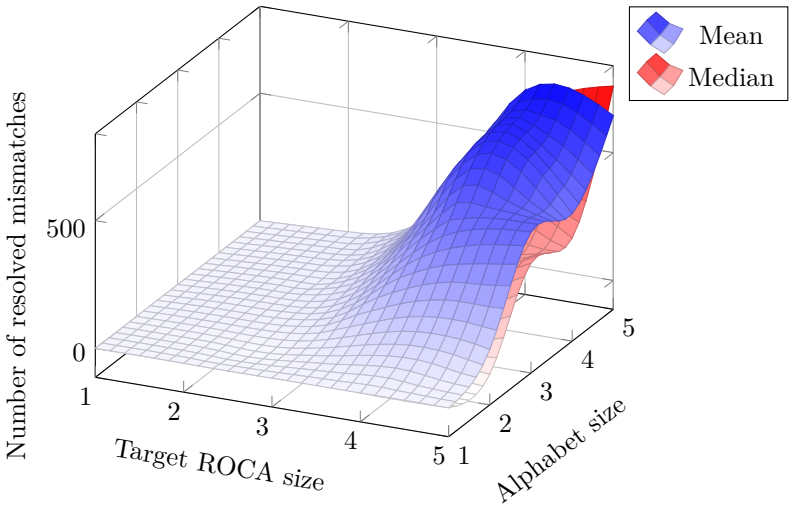


6.3 ⊥-inconsistencies



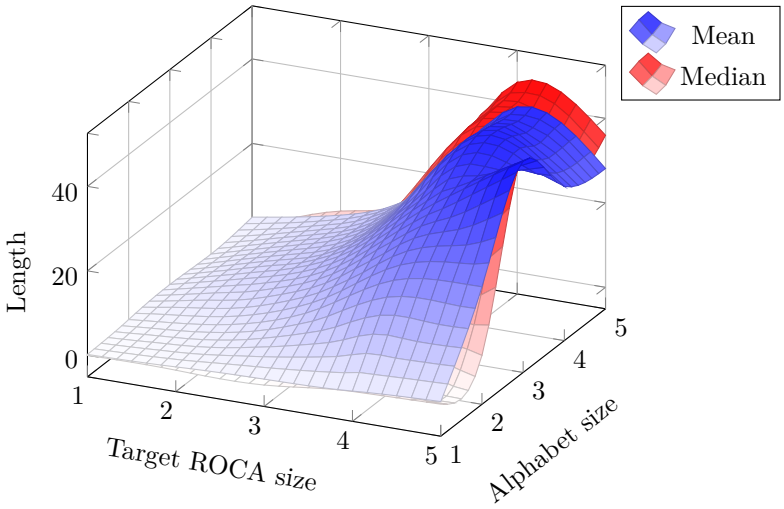
6.3.1 ⊥-inconsistencies resolved by adding separators in $\widehat{S} \setminus S$

Included in the number of ⊥-inconsistencies.

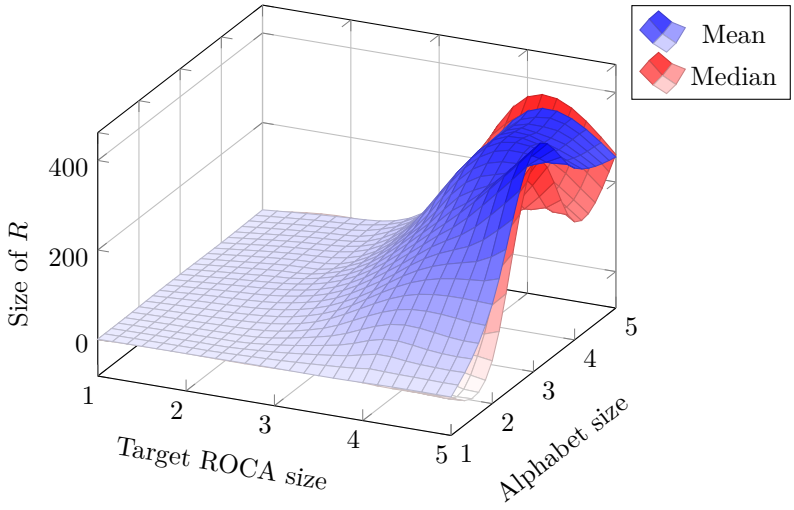


7 Size of sets and counterexamples

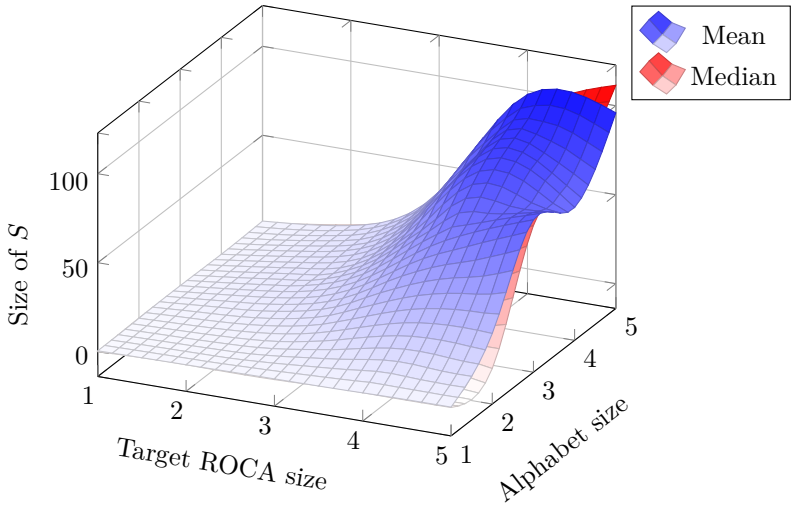
7.1 Length of the longest counterexample



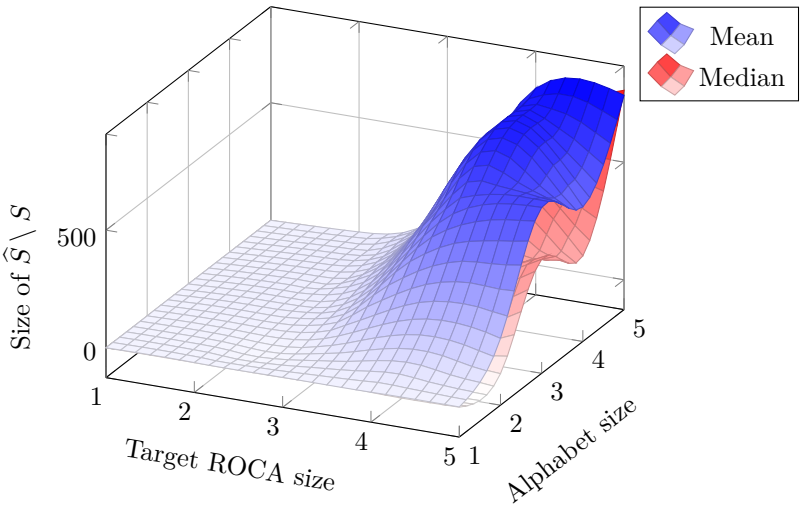
7.2 Size of R



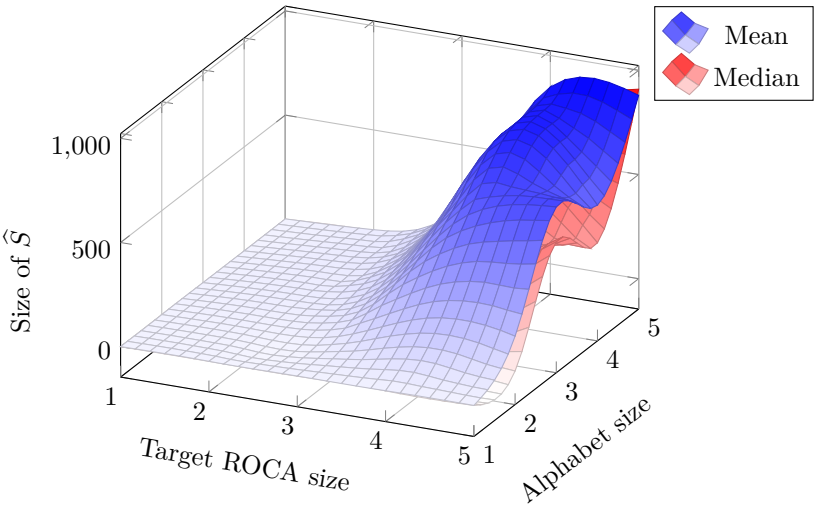
7.3 Size of S



7.4 Size of $\widehat{S} \setminus S$

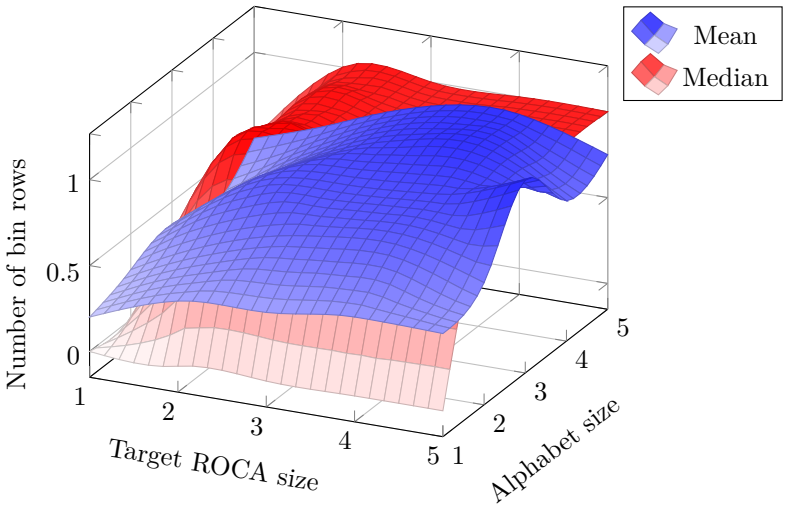


7.5 Size of $\widehat{S}$



7.6 Number of bin rows

A bin row $u \in R$ is such that $C_\ell(u) = \perp$. This is more for debugging purpose. I'm satisfied by the figure, so you can ignore it if you want.



8 Size of the learned ROCA