

Author: Denis Kurka
Supervisor: Ing. Lukáš Kekely, Ph.D.

Hashed filters categorisation

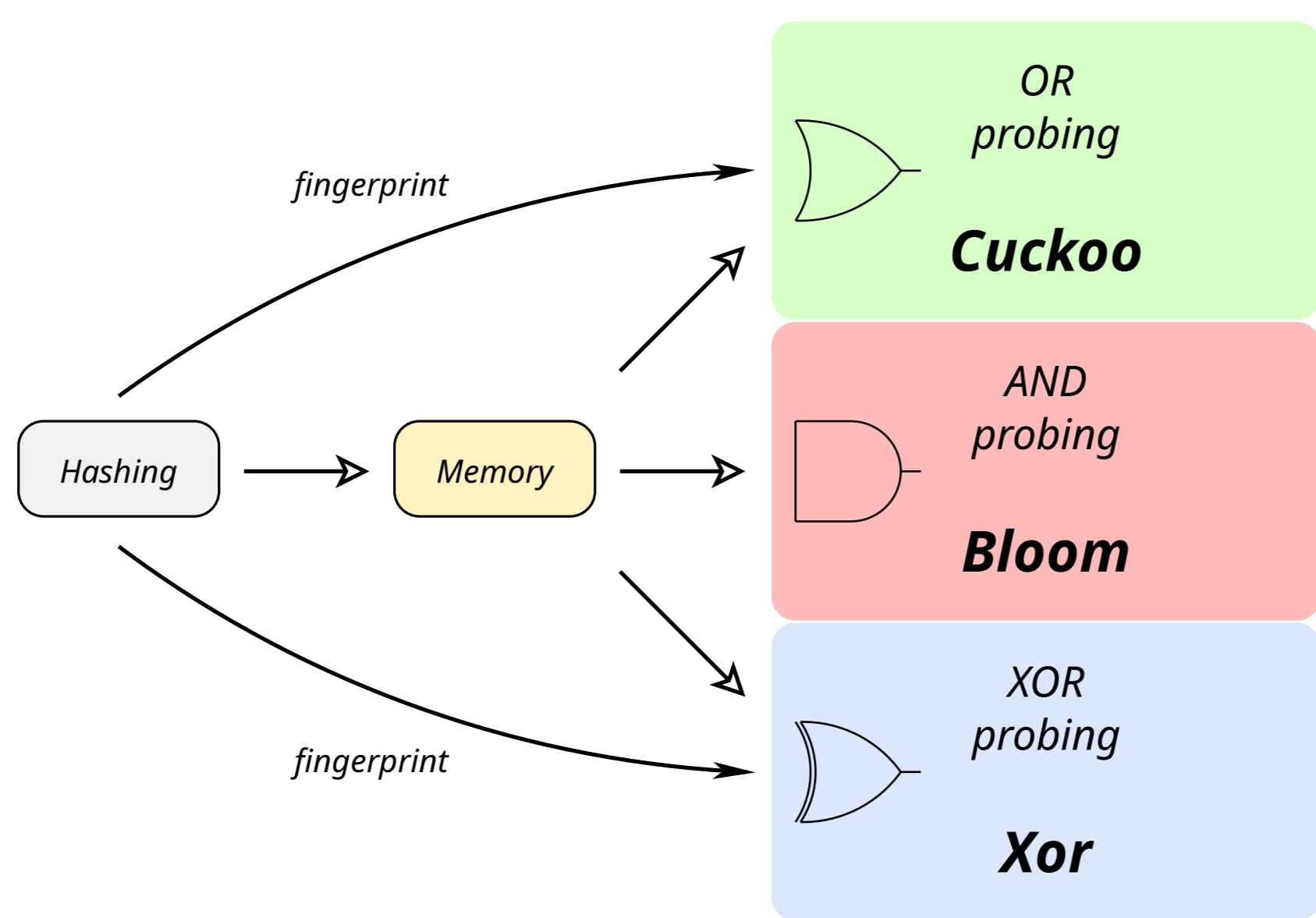


Figure 1 Probing techniques of hashed filters.

Implementation flowchart

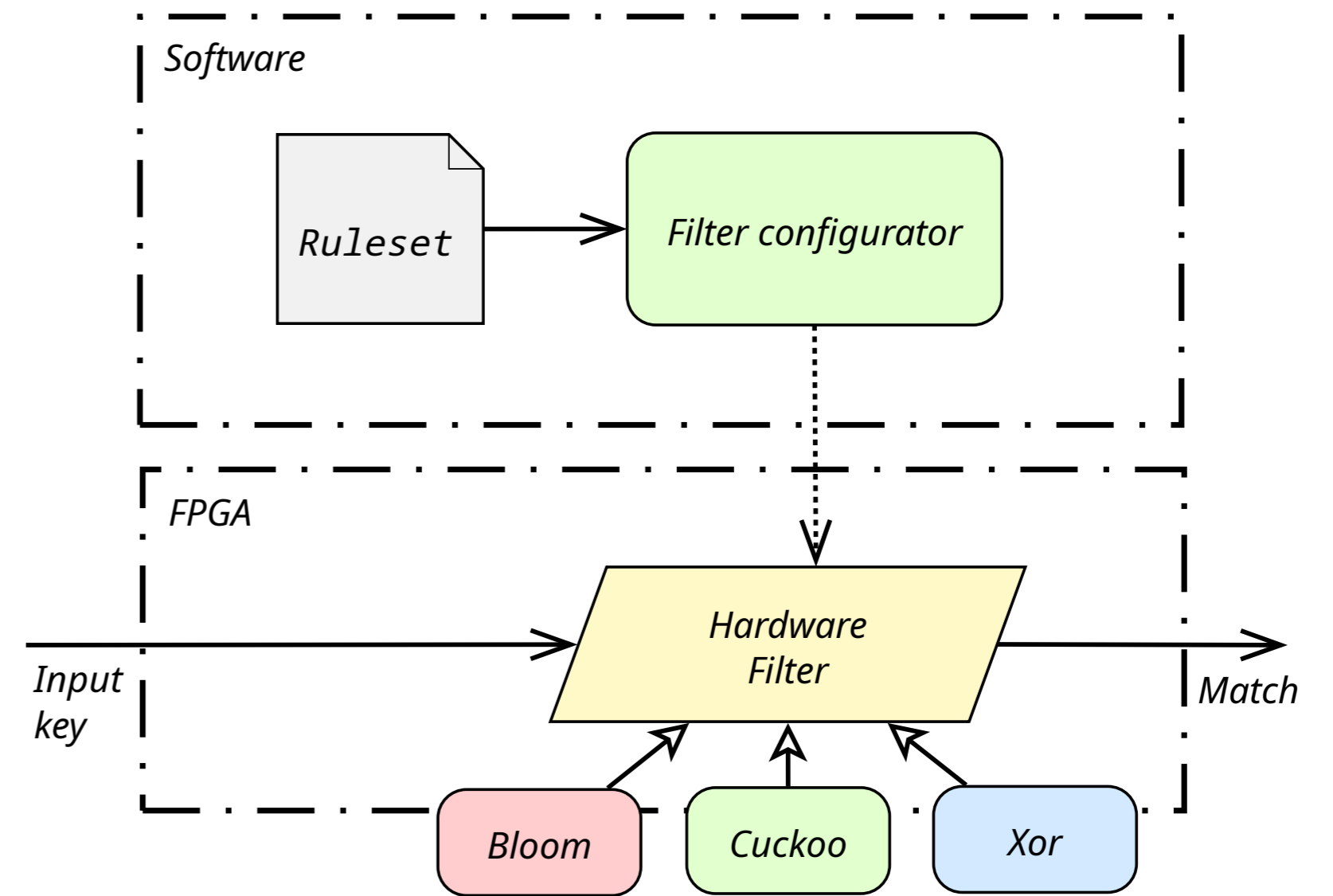


Figure 2 High-level filtering overview.

Space efficiency and error rate

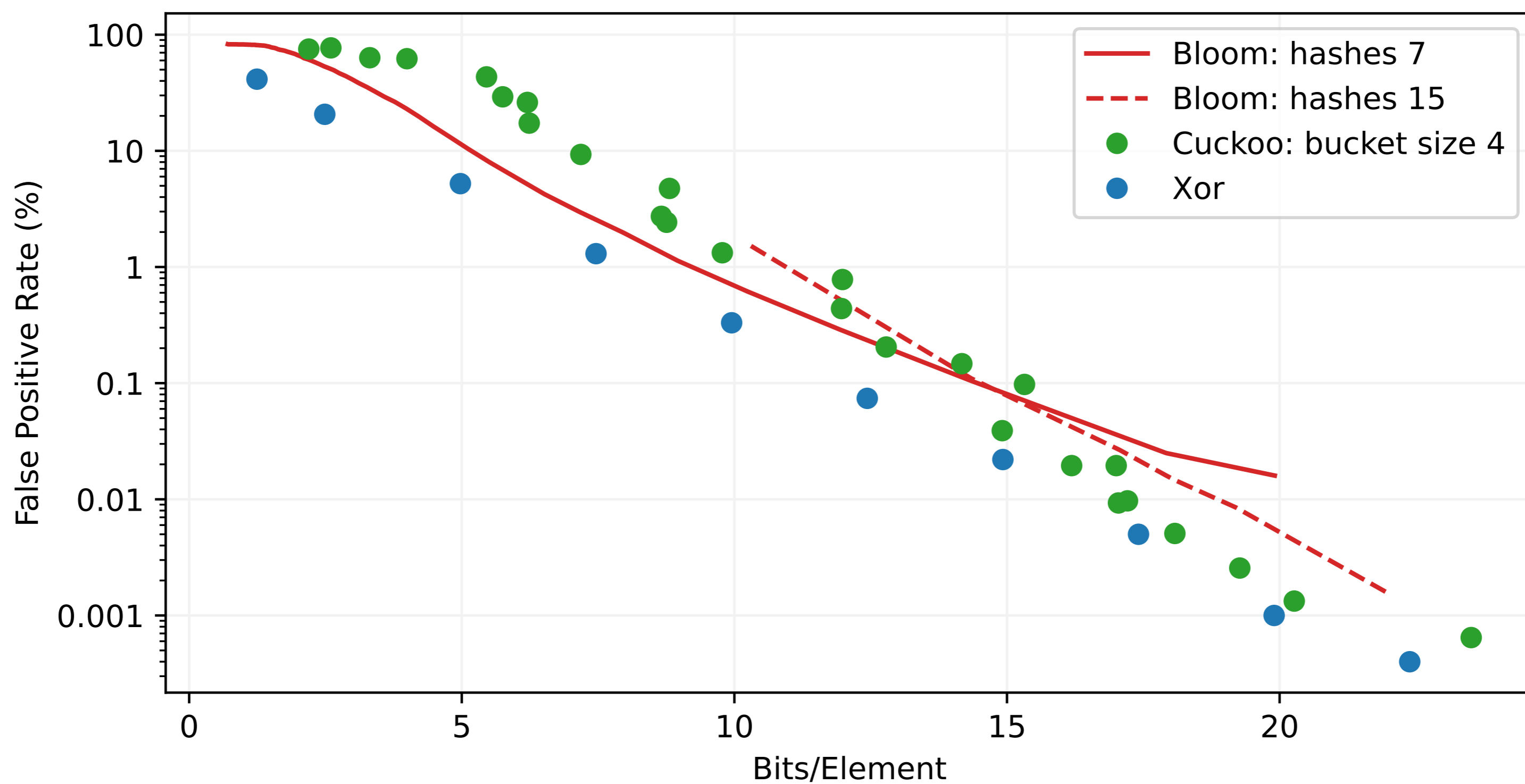


Figure 3 Dependency of each filter's error rate and size for every inserted element.

Xor filter achieves the BEST error rate in every filter size comparison.

Interesting configurations

Filter configurations <30000 rules					
		False positive rate	bits\element	max freq (Mhz)	CLBs
Best bits\element	Bloom7	4.2%	6.5	810	1048
	Cuckoo4-7	4.7%	8.8	500	417
	Xor4	5.2%	5	336	693
Best false positive rate	Bloom7	0.29%	12	810	1048
	Cuckoo4-12	0.21%	14	370	508
	Xor8	0.33%	10	400	1164
Best false positive rate	Bloom15	0.008%	19.2	810	1876
	Bloom7	0.005%	23.1	810	1048
	Cuckoo4-16	0.009%	17.4	421.8	523
	Xor14	0.005%	17	362.8	1022

Table 1 Configurations summary.

FPGA usage

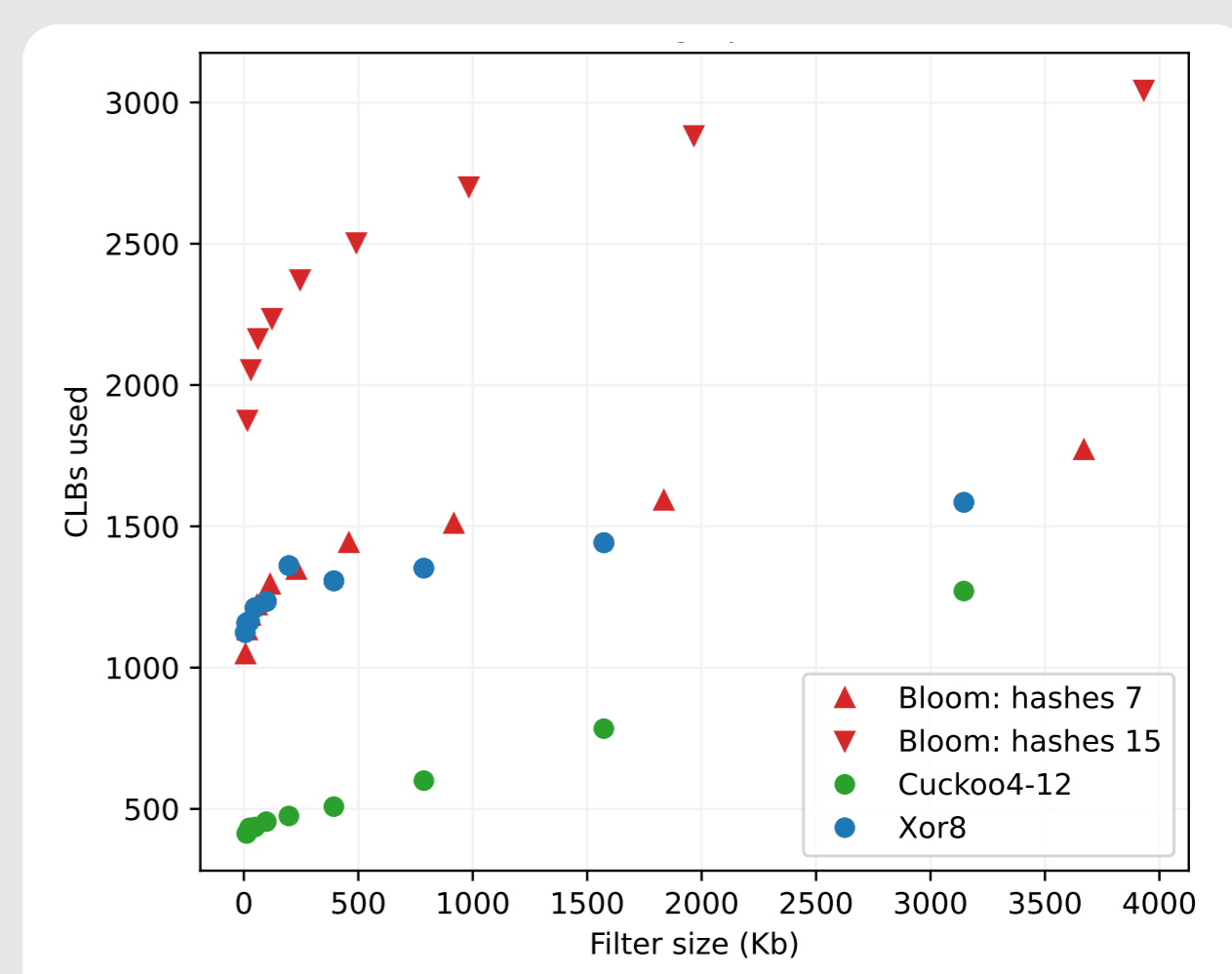


Figure 4 CLBs usage and the filter size.