# Mopsa-C at SV-Comp 2024

<u>Raphaël Monat</u>, Marco Milanese, Francesco Parolini, Jerôme Boillot, Abdelraouf Ouadjaout, Antoine Miné

SV-Comp 8 April 2024





# Modular Open Platform for Static Analysis

gitlab.com/mopsa/mopsa-analyzer



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- Runtime error detection
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- Optimized for relational domains
- ► Ease dev.: interactive engine, hooks

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Multiple languages	Contributors (2018–2024)					
► C	► G. Bau	► M. Milanese	► M. Journault			
► Python (+C)	► J. Boillot	► A. Miné	► F. Parolini			
► µOCaml	► D. Delmas	► R. Monat	► M. Valnet			
<ul> <li>Michelson</li> </ul>	► A. Fromherz	► A. Ouadjaout				

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Max. Conf.	Tasks proved correct		Tasks yielding timeout		
1	6995		368		
2	7775	(+780)	717	(+349)	
3	8197	(+422)	2954	(+2237)	
4	8257	(+60)	3527	(+573)	
5	8400	(+143)	9532	(+6005)	

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  - Precise handling of **memset** of <u>constant</u> size
  - NULL pointer synthesis from contiguous block of 0 bytes.

# Our results – *SoftwareSystems* track

Category	Prop.	tasks	Mopsa'23	Mopsa'24	Best score (2024)	
AWS	R	197	32	36	137	Symbiotic
coreutils	Μ	140	0	0	0	_
coreutils	Ν	30	0	4	4	Mopsa
BusyBox	Ν	54	4	8	8	Mopsa
DDL	R	2442	3174	3476	3476	Mopsa
DDLL	R	8	10	14	14	Mopsa
DDL	Μ	141	0	8	71	Bubaak-SpLit
other	R	22	0	10	10	Mopsa
other	Μ	34	0	12	12	Mopsa
uthash	R	138	0	192	228	Bubaak*, Symbiotic
uthash	Μ	138	0	96	204	Bubaak*, Symbiotic
uthash	Ν	114	0	204	204	Mopsa

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- Handy new YAML format!
- ▶ Goblint has a much smarter approach

Beyer and Spiessl. "MetaVal: Witness Validation via Verification". CAV (2) 2020 Saan, Schwarz, Erhard, Seidl, Tilscher, and Vojdani. "Correctness Witness Validation by Abstract Interpretation". VCMAI 2024

Scalability (even for DeviceDriversLinux-Large)

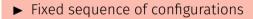
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- ► Fixed sequence of configurations
- ► Unable to provide counterexamples

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### Weaknesses

- ► Fixed sequence of configurations
- ► Unable to provide counterexamples
- ► Not competitive outside *SoftwareSystems*: array segmentation, partitioning?

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