Model Checking Contest, Results for 2026

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Sorbonne Université & CNRS

and the participating tool developers : N. Amat, B. Berthomieu, M. Dyer, J. Srba, Y. Thierry-Mieg and A. Yates

MCC@Petri Nets 2026 - June 23, 2026

Agenda

- MCC'2026, context
- Winners & Awards
- Global outcomes

MCC'2026, context

The MCC in a nutshell

Tool developers

MCC staff

- Qualification phase
- Execution phase
- Consolidation phase
- Construction of results

What is Computed by Tools

- Ansvering 6 categories of problems

Examination	Category
StateSpace	**StateSpace**
ReachabilityDeadlock QuasiLiveness StableMarking Liveness OneSafe	**GlobalProperties**
UpperBounds	**UpperBounds**
ReachabilityCardinality ReachabilityFireability	**Reachability**
CTLCardinality CTLFireability	**CTL**
LTLCardinality LTLFireability	**LTL**

.. on 147 models with a total of 1953 instances

25 389 queries (1, 4 or 16 values to be returned per query)

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LTLCardinality LTLFireability	LTL

218 736 new formulas in 2026

For UpperBounds, Reachability, CTL, LTL

.. on 147 models with a total of 1953 instances

25 389 queries (1, 4 or 16 values to be returned per query)

5 Surprise Models in 2026

98 new model/instances

- ErlangenMainframeV1 (20 instances P/T)
  - Hubert Garavel
  - up to 348 places, 79 094 transitions, 2 458 524 arcs
- ErlangenMainframeV2 (20 instances P/T)
  - Hubert Garavel
  - up to 342 places, 79 090 transitions, 2 311 055 arcs
- FileSystem (10 instances P/T + 10 instances Colored)
  - Silvano Dal Zilio
  - 11 places, 7 transitions, 25 arcs (in the colored model)
- LastZero (10 instances P/T + 10 instances Colored)
  - Silvano Dal Zilio
  - 4 places, 3 transitions, 11 arcs (in the colored model)
- SupplyChain (18 instances P/T)
  - Eric Lubat
  - up to 130 004 places, 80 003 transitions, 360 006 arcs

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Scoring Principles

model contribute between 102 and 221 points for an examination/model pair
(to reduce the bias toward models with many instances)

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Model Weights

$\times 1$ for «known» models
$\times 13$ for «surprise» models
total surprises models $\approx \frac{1}{2}$ total known models

Participating Tools in 2026

6 qualified tools, including 2 new participants

2 184 qualification runs per tool

Tool	Nets	Representative	Institution (country)
tedd	P/T + Colored	B. Berthomieu	LAAS-CNRS (FR)
SMPT	P/T + Colored	N. Amat	ONERA (FR)
Tapaal	P/T + Colored	J. Srba	Aalborg University (DK)
petrivet (new)	P/T	M. Dyer	Technical University of Munich (D)
TY (new)	P/T + Colored	A. Yates	Ferrite Technology (USA)
ITS-Tools	P/T + Colored	Y. Thierry-Mieg	Sorbonne Universite (FR)
Gold-2025	P/T + Colored	F. Kordon	Composite reference from 2025 winners (FR/DK)
BVT-2026	P/T + Colored	Organizers	Best virtual tool, assembled from correct answers

Experimental conditions

1 or 4 cores (virtual) computer – 16GB memory confinement – 30mn or 60mn time confinement
Only physical core are allocated to VM (pin to a specific set of cores)

A total of 177 773 runs & 35 GB of collected data and CSV files

Computing Resources

Thanks to those who lent us great machines!

Computer	Institution	Nodes	Physical cores	Processed runs	CPU days
octoginta-2	Univ. Nanterre	1	80	18,928	272
small	LIP6/Sorbonne Université	23	276	63 154	862
tall	LIP6/Sorbonne Université	13	416	95 641	1 265
Total		37	772	177 723	2 399

Elapsed Time (without consolidation)

About 19 days and 19 hours

Used CPU

About 6 years, 6 months, 29 days, and 8 hours

Winners & Awards

New Awards in 2026

The **Blue Whale award** celebrates depth, strength, and a massive appetite for data. It is awarded to the tool that **computes the highest number of correct, partial results** in a category, such as the verdict for a formula or general property, a number of states, an upper bound, etc. Every value counts equally and, to keep the playing field level, special tools are excluded and score multipliers for surprise models are not used

The **James Cook award** celebrates exploration, and tools that can give an answer when nobody else can. It is awarded to the tool **answering the largest number of unique**, correct results for a given category, meaning a partial result that has not been computed by another tool (excluding special tools). While the name might bring the Cook-Levin theorem to mind, this award is named after Captain James Cook, celebrating the spirit of exploring uncharted territories.

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All examinations together

Tapaal : 200 985 values

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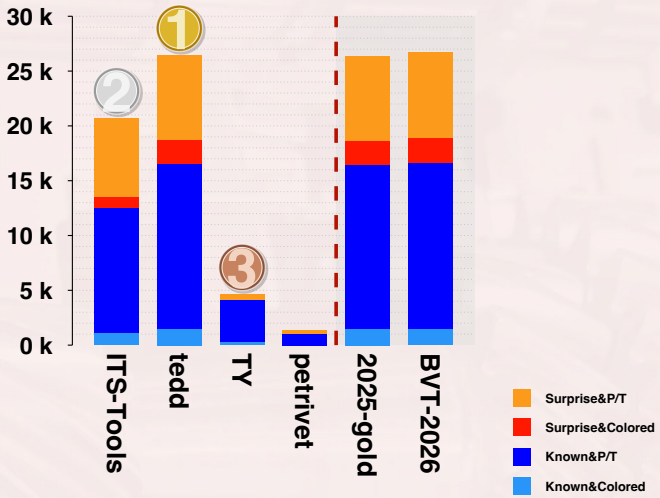
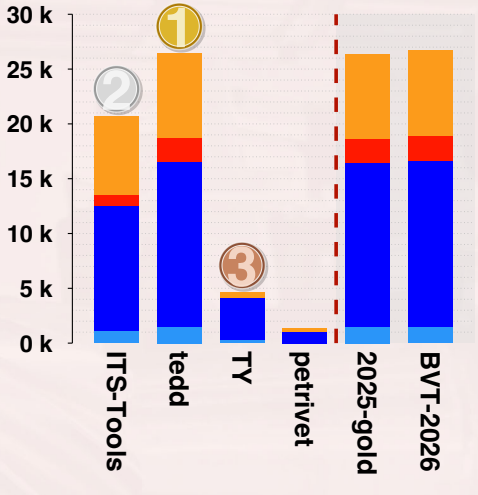
StateSpace Category



StateSpace Category (details & awards)



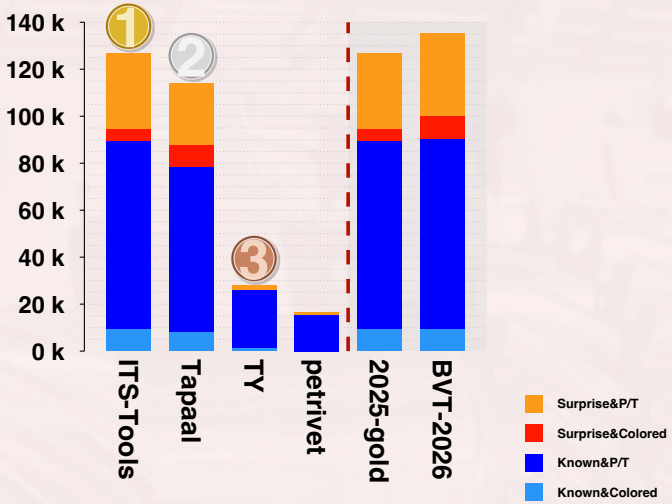
26 414 pts 20 708 pts 4 599 pts

Awards for this examination

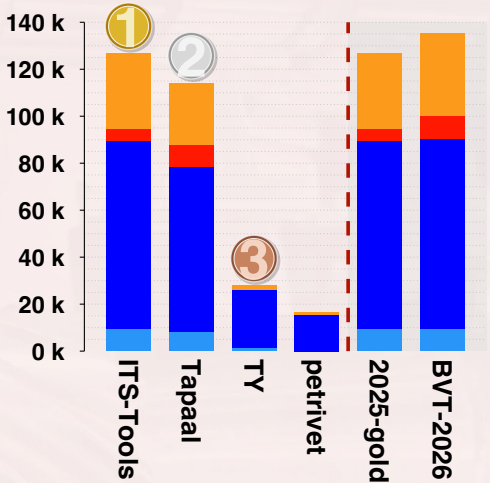
tedd
5 490
computed values

tedd
2 085
uniques values

GlobalProperties Category



GlobalProperties Category (details & awards)



126 679 pts

114 166 pts

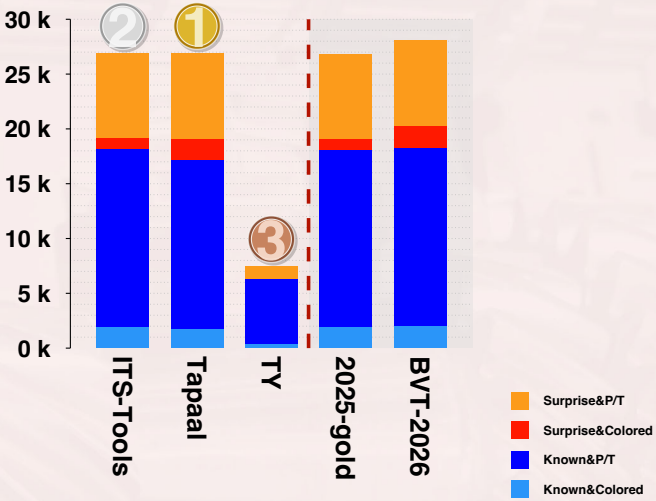
27 798 pts

Awards for this examination

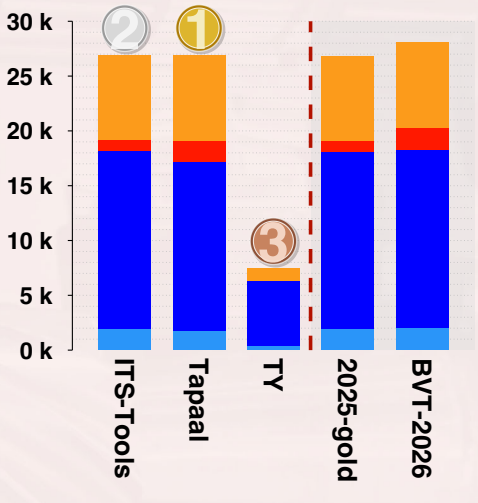
ITS-Tools
9 187
computed values

ITS-Tools
1 192
uniques values

UpperBounds Category



UpperBounds Category (details & awards)



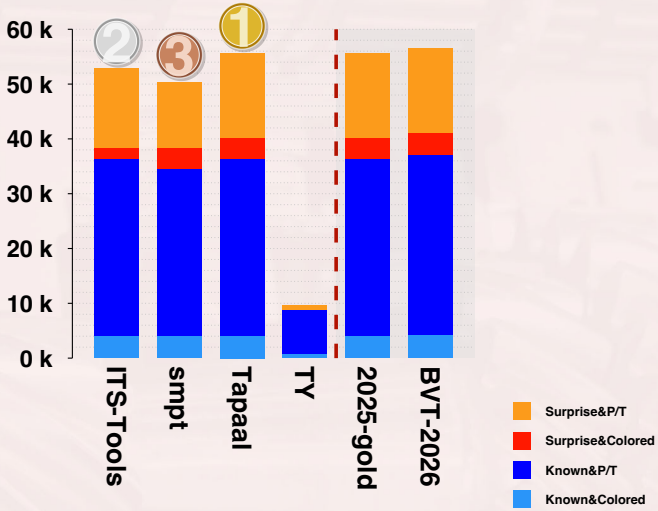
26 892 pts 26 883 pts 7 449 pts

Awards for this examination

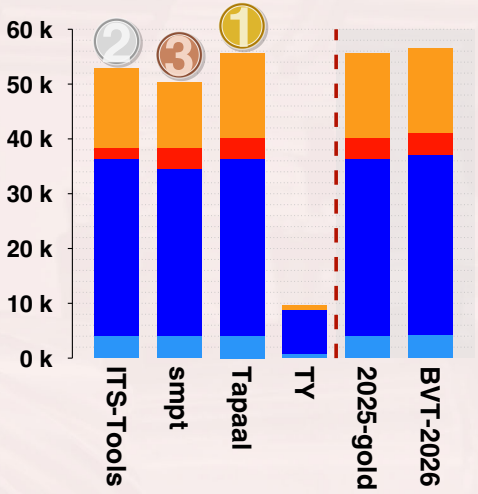
ITS-Tools
29 982
computed values

ITS-Tools
1 719
uniques values

Reachability Formulas Category



Reachability Formulas Category (details & awards)

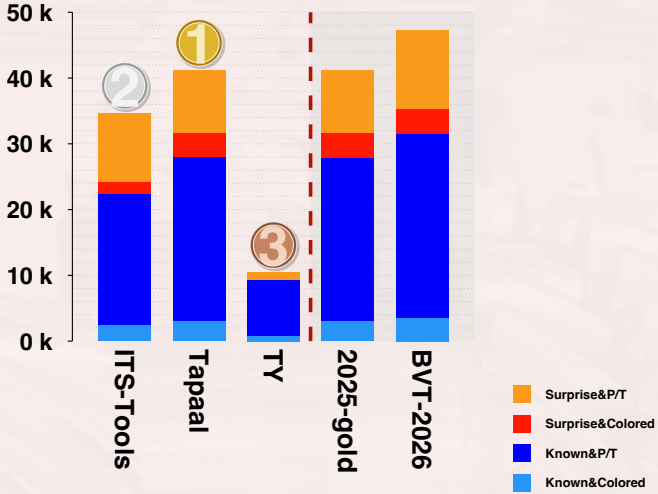


Awards for this examination

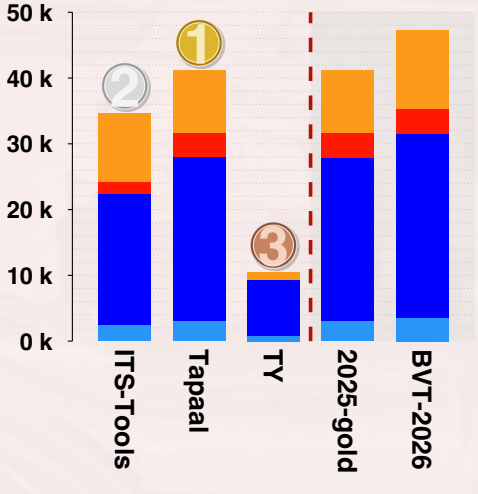
Tapaal
60 138
computed values

Tapaal
916
uniques values

CTL Formulas Category



CTL Formulas Category (details & awards)



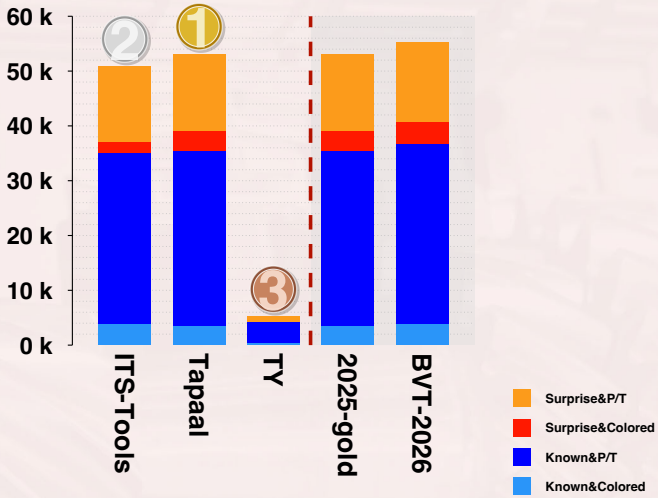
41 208 pts 34 671 pts 10 448 pts

Awards for this examination

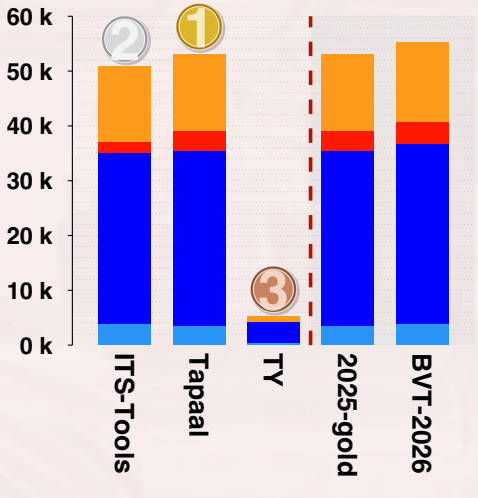
Tapaal
46 079
computed values

Tapaal
13 900
uniques values

LTL Formulas Category



LTL Formulas Category (details & awards)



53 134 pts 50 867 pts 5 221 pts

Awards for this examination

Tapaal
58 135
computed values

Tapaal
2 755
uniques values

Tool Confidence (Global)

Tool	Confidence	Correct	Significant	# Examinations
ITS-Tools	99.998%	183 859	183 862	13
SMPT	100.000%	55 622	55 622	2
Tapaal	100.000%	182 819	182 819	12
tedd	100.000%	3 849	3 849	1
TY	99.674%	44 894	45 041	13
petrivet	97.536%	1 821	1 867	6
Gold-2025	99.999%	186 751	186 752	13
BVT-2026 [1]	100.000%	186 724	186 724	13

This is excellent !!!

And particularly for new tools
(in the past, much lower confidence was observed for the first participation)

1. This is by definition – it means that all tool together computed 79.01% of the total values to be computed

Tool Confidence (Global)

This is excellent !!!

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Tool Confidence (per Category)

StateSpace

Tool	Confidence	# correct	# values
ITS-Tools	100,000%	3 522	3 522
tedd	100,000%	3 849	3 849
TY	100,000%	1 252	1 252
petrivet	93,696%	431	460
2025-gold	100,000%	3 849	3 849
BVT-2026	100,000%	3 794	3 794

GlobalProperties

Tool	Confidence	# correct	# values
ITS-Tools	99,987%	7 984	7 985
TY	99,377%	2 391	2 406
petrivet	98,792%	1 390	1 407
Tapaal	100,000%	7 915	7 915
2025-gold	99,987%	7 984	7 985
BVT-2026	100,000%	7 985	7 985

UpperBounds

Tool	Confidence	# correct	# values
ITS-Tools	100,000%	28 234	28 234
TY	99,863%	9 466	9 479
Tapaal	100,000%	28 234	28 234
2025-gold	100,000%	28 234	28 234
BVT-2026	100,000%	28 234	28 234

Reachability Formulas

Tool	Confidence	# correct	# values
ITS-Tools	99,997%	58 293	58 295
TY	99,214%	12 374	12 472
Tapaal	100,000%	59 190	59 190
smpt	100,000%	55 622	55 622
2025-gold	100,000%	59 209	59 209
BVT-2026	100,000%	59 230	59 230

CTL Formulas

Tool	Confidence	# correct	# values
ITS-Tools	100,000%	30 508	30 508
TY	99,881%	13 447	13 463
Tapaal	100,000%	32 137	32 137
2025-gold	100,000%	32 132	32 132
BVT-2026	100,000%	32 138	32 138

LTL Formulas

Tool	Confidence	# correct	# values
ITS-Tools	100,000%	55 318	55 318
TY	99,916%	5 964	5 969
Tapaal	100,000%	55 343	55 343
2025-gold	100,000%	55 343	55 343
BVT-2026	100,000%	55 343	55 343

Tool Confidence (per Category)

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Tool	Confidence	# correct	# values
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UpperBounds

Tool	Confidence	# correct	# values
ITS-Tools	100,0		
TY	99,8		
Tapaal	100,0		
2025-gold	100,0		
BVT-2026	100,0		

Reachability Formulas

Tool	Confidence	# correct	# values
		58 293	58 295
		12 374	12 472
		59 190	59 190
		55 622	55 622
		59 209	59 209
		59 230	59 230

Minimum required for scoring when being alone to compute a value

99.997% (see rules)

CTL Formulas

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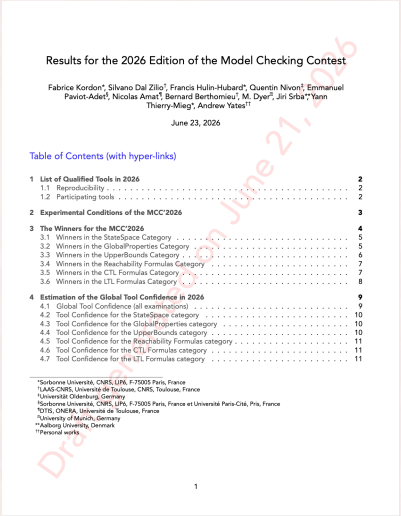
Global outcomes

Some thoughts from the 2026 results

- Evolution, not revolution
  - New tools and fresh perspectives enrich the competition
    - *but impact on the community is a long term issue*
    - *new interesting development approach (gen AI for TY, academic use for petrivet)*
- Reliability of the scoring and award outcomes
  - Awards mostly align with scores
    - *only exception is UpperBounds but 9 pts differentiate gold from silver*
    - *~ 90–95% of computed values, we get close to max*
- New reporting format introduced in 2026
  - Detailed HTML report as usual
  - Citable synthetic report (to come this summer)
    - *presentation of results*
    - *Annexes (tool datasheet, pluriannual evolution, new analysis diagrams, etc.)*



Results for the 2026 Edition of the Model Checking Contest

Fabrice Kordon*, Silvano Dal Zilio†, Francis Hulin-Hubard‡, Quentin Nivon†, Emmanuel Paviot-Adet§, Nicolas Amat¶, Bernard Berthomieu‖, M. Dyer**, Jiri Srba††, Yann Thierry-Mieg*, Andrew Yates††

June 23, 2026

Table of Contents (with hyper-links)

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‡Universität Oldenburg, Germany
§Sorbonne Université, CNRS, LIP6, F-75005 Paris, France et Université Paris-Cité, Pris, France
¶DTIS, ONERA, Université de Toulouse, France
‖University of Munich, Germany
**Aalborg University, Denmark
††Personal works

Open Science & Reproducibility

- Open data !
  - Tool developers agreed to provide the submitted disk images
  - 2026 models and formulas are also available on the web site
    - *as a disk image* : *https://mcc.lip6.fr/2026/archives/mcc2026-input.tar.gz*
    - *as an archive* : *https://mcc.lip6.fr/2026/archives/INPUTS-2026.tar.gz*
  - This enables independent replay, comparison, and further analysis on the same benchmark
- We welcome your inputs, links to new publications and research projects related to the MCC Benchmarks. Your contributions and models drive progress
- So do not hesitate to reuse these data
  - For your own experiments
  - For testing your tools

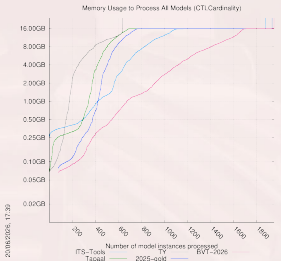
Conclusion

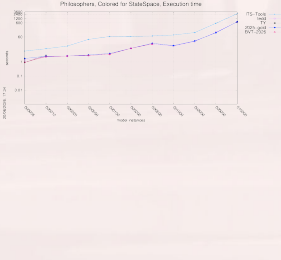
Online results in a few minutes

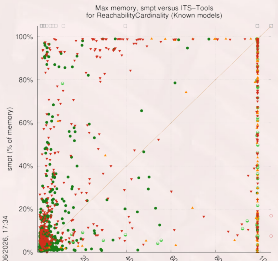
Detailed results, charts, archives, and certificates are published from the MCC web site.

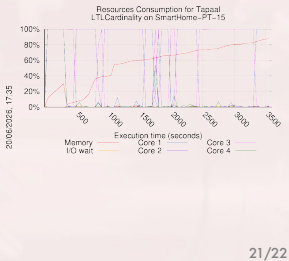
`https://mcc.lip6.fr`

Example for a medal certificate : `https://mcc.lip6.fr/certificates/2026/gold-Reachability-2026.png`
Example for confidence certificate : `https://mcc.lip6.fr/certificates/2026/conf100-smpt-2026.png`









Conclusion

Online results in a few minutes

Detailed results, charts, … e MCC web site.

Example for a medal cer… Reachability-2026.png
Example for confidence… onf100-smpt-2026.png

One last thing...

A great “thank you”

To the tool developers...
Nicolas Amat, Bernard Berthomieu, Michael Dyer, Jiri Srba, Yann Thierry-Mieg and Andrew Yates

To the model designers..
Silvano Dal Zilio, Hubert Garavel, Eric Lubat

An to the MCC team...
Silvano Dal Zilio, Francis Hulin-Hubard, Emmanuel Paviot-Adet, Quentin Nivon

We hope to see you next year in Rennes !!!