



SORBONNE
UNIVERSITÉ

Model Checking Contest results for 2018

Fabrice Kordon — LIP6, Sorbonne Université, France

Hubert Garavel — Inria/LIG, France

Lom Messan Hillah — LIP6 & Université de Nanterre, France

Francis Hulin-Hubard — LSV, CNRS/ENS de Paris-Saclay, France

Emmanuel Paviot-Adet — LIP6 & Université Paris Descartes, France

Loïc Jézequel, LS2N, Université de Nantes, France

INCC 2018

Objective 1 : promoting model checking tools

-  Compare and debug
-  Enhance reproducibility of results
-  Encourage tools
 - ▶ To enhance reliability
 - ▶ To increase their features
-  Encourage interoperability among tools

Objective 2 : creating a common collection of benchmarks

-  <https://pnrepository.lip6.fr>
-  <https://mcc.lip6.fr/models.php>

Hubert Garavel
(Inria)



Lom Hillah
(UPN)



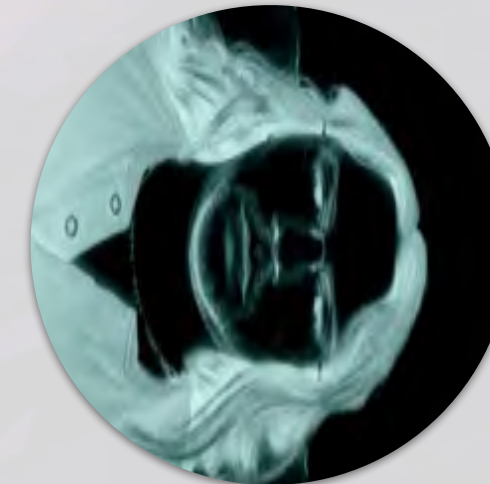
**Managing
Models**

**Managing
Execution +
analysis**

Fabrice Kordon
(UPMC)



Francis Hulin-Hubard
(CNRS)



Loïc Jezequel
(U. Nantes)



Emmanuel Paviot-Adet
(UP5)



**Managing
Formulas**

**מנהל
2018**

New Models etc.

«known» models

Those from past years

► Test the tool as used by its developers

Model $\Rightarrow$ one Petri net, possibly with scaling parameter

Instance $\Rightarrow$ one Petri-net with scaling parameters instantiated

«Surprise» models

New models proposed by the community this year

► Test the tool as used by «non-expert» of the tool

► new situations for the tool



Stripped

Coefficients in 2018

808 «known» instances (x 1)
139 «surprise» instances (x 4)

MCC 2018 13 New Models for 2018

6

 **E. Amparore**

 NQueens, HospitalTriage

 **A. Bouzafour, M. Renaudin, and H. Garavel**

 ASLink

▶+ **NUPN**

 **T. Chatain and L. Paulevé**

 MAPKbis, EGFr

 **H. Evrard, A. Donaldson, & T. Sorensen**

 DLCflexbar, DiscoveryGPU

▶+ **NUPN**

 **T. Hujsa**

 RefineWMG

 **A. Krishna & G. Salaün**

 BusinessProcesses

▶+ **NUPN**

 **J. v.d. Pol**

 RERS17pb113, RERS17pb114, RERS17pb115

▶+ **NUPN**

 **D. Zaitsev**

 DoubleExponent

▶+ **NUPN**

MCC 2018 13 New Models for 2018

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● E. Amparore

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processes

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● BERS17pb113, RERS17pb114,
115

New

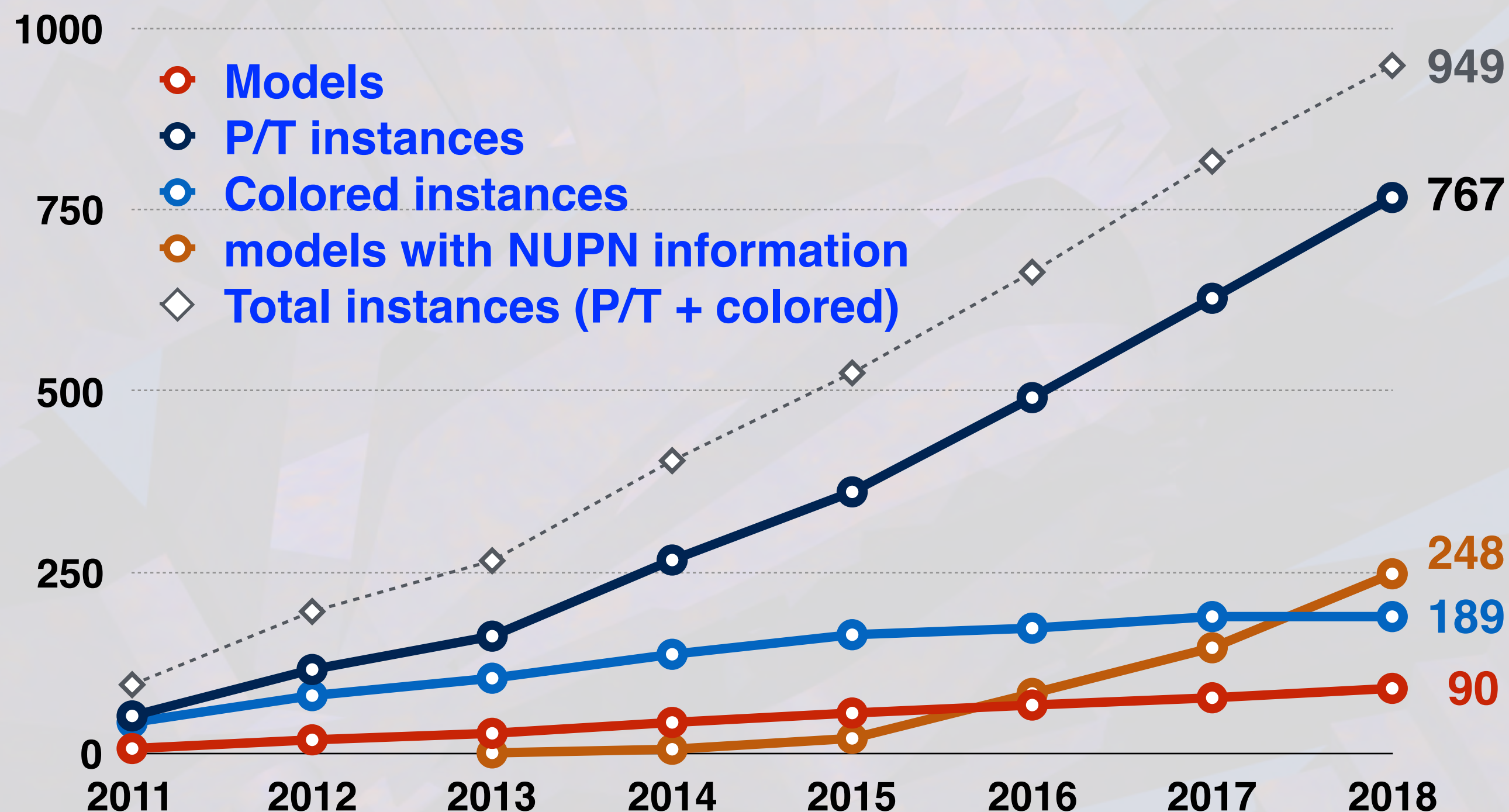
Verdict files

● DoubleExponent

▶+ NUPN

Thanks!!!

We really need different models

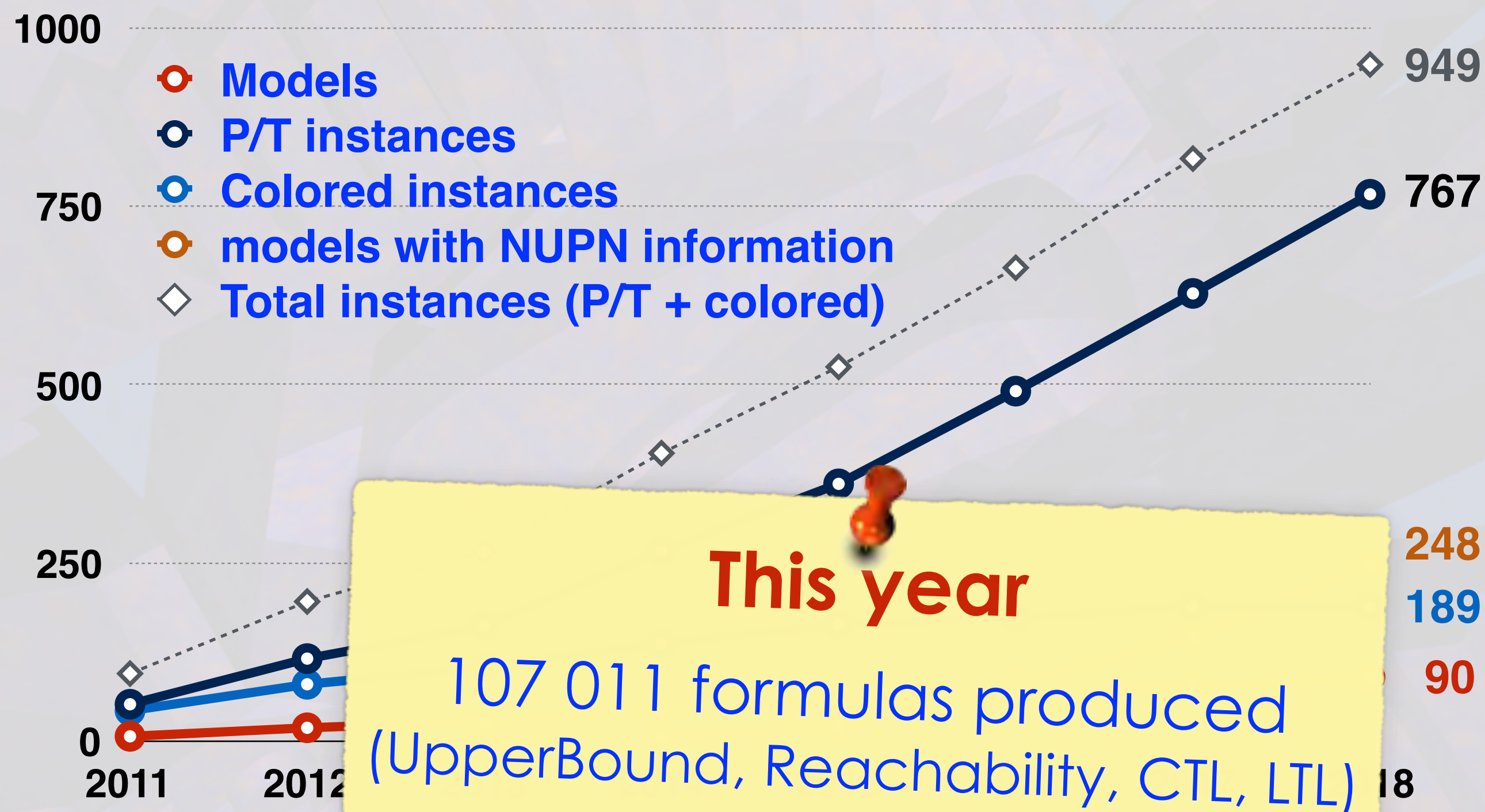
 Extending the collection of benchmarks every year

Data on the MCC	2011	2012	2013	2014	2015	2016	2017	2018
% of colored instances	45,26 %	40,82 %	39,10 %	33,91 %	31,24 %	26,05 %	23,13 %	19,92 %
Number of selected instances	95	196	266	404	525	664	586	949

MCC 2018 8 Editions of MCC — Benchmarks

7

Extending the collection of benchmarks every year



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Number of selected instances	95	196	266	404	525	664	586	949

Model «hardness» in 2018 (1/3)

Models	comp.	total	nb tools	ratio(%)
RERS17pb114	92	801	3	11,49
RERS17pb115	99	801	3	12,36
RERS17pb113	134	801	4	16,73
ASLink	465	1780	7	26,12
DLCflexbar	363	1246	7	29,13
RefineWMG	416	1424	7	29,21
SharedMemory	483	1618	12	29,85
PolyORBLF	1000	3006	10	33,27
BART	442	1320	12	33,48
DoubleExponent	246	712	8	34,55
BusinessProcesses	631	1780	8	35,45
PolyORBNT	592	1670	10	35,45
NQueens	263	712	8	36,94
HypercubeGrid	101	267	9	37,83
GlobalResAllocation	274	718	11	38,16
TokenRing	536	1395	12	38,42
Echo	313	801	9	39,08
DatabaseWithMutex	326	829	12	39,32
HospitalTriage	35	89	7	39,33
Planning	35	89	10	39,33
DrinkVendingMachine	283	719	12	39,36

Models	comp.	total	nb tools	ratio(%)
SafeBus	400	982	12	40,73
Philosophers	1089	2639	12	41,27
PhilosophersDyn	274	652	12	42,02
NeoElection	493	1169	12	42,17
JoinFreeModules	478	1068	12	44,76
PhaseVariation	421	890	12	47,3
PermAdmissibility	476	1002	12	47,5
Peterson	473	992	12	47,68
Diffusion2D	1239	2581	12	48
BridgeAndVehicles	1615	3340	12	48,35
HypertorusGrid	259	534	12	48,5
SquareGrid	217	445	12	48,76
LamportFastMutex	572	1169	12	48,93
TCPcondis	392	801	12	48,94
GPPP	753	1513	12	49,77
QuasiCertifProtocol	586	1169	12	50,13
SmallOperatingSyste	854	1691	12	50,5
EGFr	135	267	8	50,56
DiscoveryGPU	933	1780	8	52,42
CSRepetitions	517	986	12	52,43
MAPKbis	95	178	8	53,37

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SafeBus	400	982	12	40,73
Philosophers	1089	2639	12	41,27
	874	452	12	42,02
Surprise in red Most among difficult ones this year				
Diffusion2D	1239	2581	12	48
BridgeAndVehicles	1615	3340	12	48,35
HypertorusGrid	259	534	12	48,5
SquareGrid	217	445	12	48,76
LamportFastMutex	572	1169	12	48,93
TCPcondis	392	801	12	48,94
GPPP	753	1513	12	49,77
QuasiCertifProtocol	586	1169	12	50,13
SmallOperatingSyste	854	1691	12	50,5
EGFr	135	267	8	50,56
DiscoveryGPU	933	1780	8	52,42
CSRepetitions	517	986	12	52,43
MAPKbis	95	178	8	53,37

Model «hardness» in 2018 (2/3)

Models	comp.	total	nb tools	ratio(%)
Railroad	244	445	12	54,83
Eratosthenes	294	534	8	55,06
DLCshifumi	491	890	12	55,17
MAPK	393	712	12	55,2
SimpleLoadBal	246	445	12	55,28
Parking	300	534	12	56,18
ParamProductionCell	301	534	8	56,37
HouseConstruction	402	712	12	56,46
TriangularGrid	402	712	12	56,46
Kanban	405	712	12	56,88
SwimmingPool	512	890	12	57,53
Angiogenesis	364	623	12	58,43
ClientsAndServers	1049	1780	12	58,93
CircadianClock	315	534	12	58,99
CloudDeployment	634	1068	12	59,36
DES	1066	1780	12	59,89
ERK	320	534	12	59,93
Solitaire	321	534	10	60,11
AutoFlight	1094	1780	12	61,46
CircularTrains	383	623	12	61,48
Dekker	331	534	12	61,99

Models	comp.	total	nb tools	ratio(%)
HexagonalGrid	387	623	12	62,12
RwMutex	677	1068	12	63,39
DLCround	1247	1958	12	63,69
Raft	511	800	12	63,88
AirplaneLD	961	1503	12	63,94
IBMB2S565S3960	60	89	12	67,42
ResAllocation	900	1335	12	67,42
IOTPurchase	243	356	12	68,26
RobotManipulation	793	1157	12	68,54
FlexibleBarrier	1230	1780	12	69,1
FMS	495	712	12	69,52
PaceMaker	62	89	12	69,66
CloudReconfiguration	1367	1958	11	69,82
NeighborGrid	349	445	12	78,43
ProductionCell	70	89	12	78,65
DNAwalker	1316	1602	12	82,15
ARMCACHECoherenc	74	89	11	83,15
Referendum	1105	1319	12	83,78
Ring	75	89	12	84,27
UtahNoC	76	89	12	85,39
EnergyBus	77	89	11	86,52

Models	comp.	total	nb tools	ratio(%)
Vasy2003	77	89	11	86,52
MultiwaySync	78	89	11	87,64
IBM319	86	89	12	96,63
IBM703	86	89	12	96,63
IBM5964	87	89	12	97,75

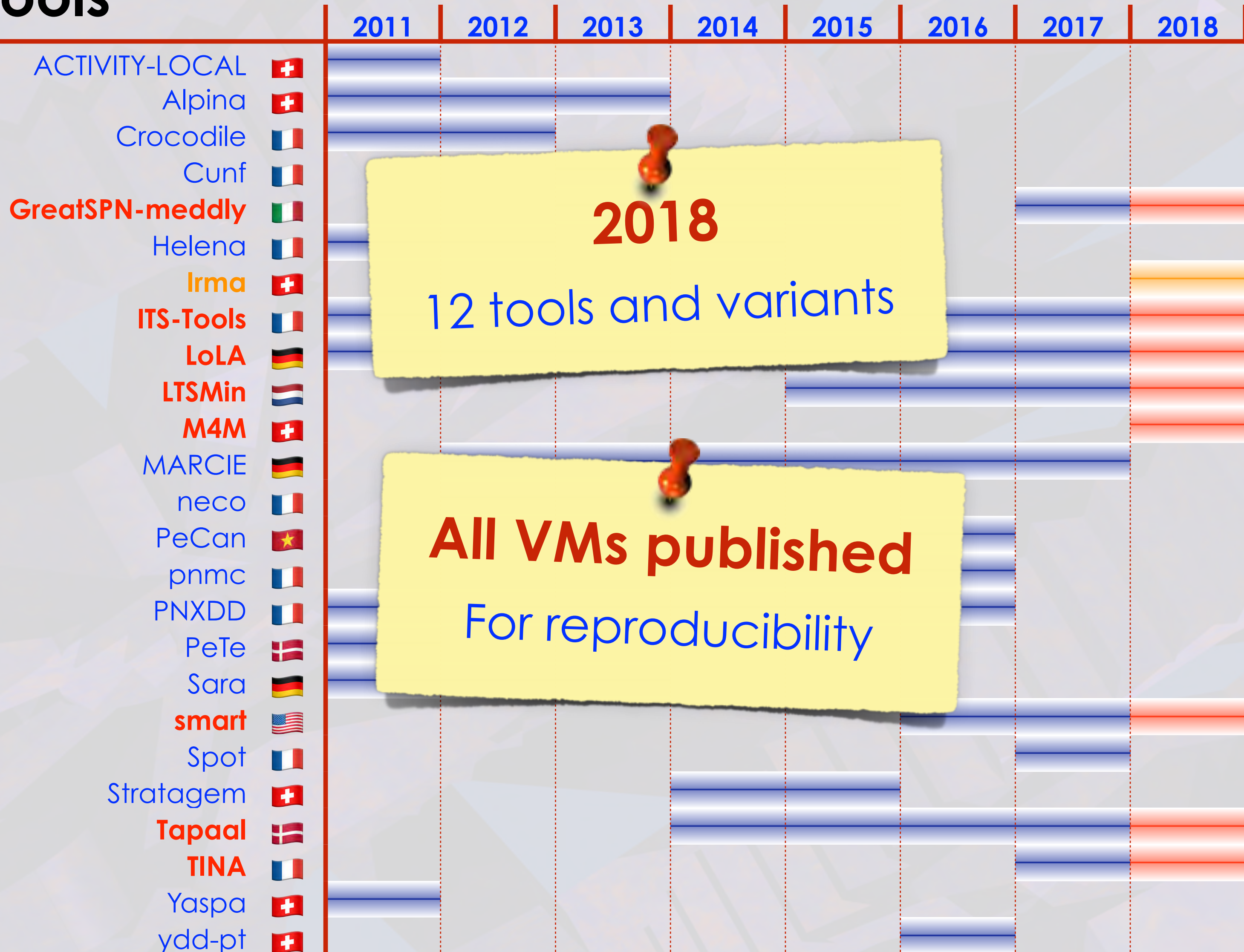
**מכון
2018**

Participating Tools

25 tools

		2011	2012	2013	2014	2015	2016	2017	2018
ACTIVITY-LOCAL									
Alpina									
Crocodile									
Cunf									
GreatSPN-meddlly									
Helena									
Irma									
ITS-Tools									
LoLA									
LTSMin									
M4M									
MARCIE									
neco									
PeCan									
pnmc									
PNXDD									
PeTe									
Sara									
smart									
Spot									
Stratagem									
Tapaal									
TINA									
Yaspa									
ydd-pt									

25 tools



2018
12 tools and variants

All VMs published
For reproducibility

Tools	PN type	parallelism	Techniques
GreatSPN-Meddlly	P/T & Col	/	DECISION_DIAGRAMS TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN
smart	P/T	/	DECISION_DIAGRAMS IMPLICIT RELATIONS
Tina	P/T & Col	/	ABSTRACTIONS DECISION_DIAGRAMS STRUCTURAL_REDUCTION UNFOLDING_TO_PT USE_NUPN
ITS-Tools	P/T & Col	Colat	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION LTSMIN PARTIAL_ORDER SAT_SMT STRUCTURAL_REDUCTION TAUTOLOGY TOPOLOGICAL USE_NUPN
ITS-Tools.L	P/T & Col	Colat	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION LTSMIN PARTIAL_ORDER SAT_SMT STRUCTURAL_REDUCTION TAUTOLOGY TOPOLOGICAL USE_NUPN
LoLA	P/T & Col	Colat	EXPLICIT SAT_SMT STATE_COMPRESSION STUBBORN_SETS SYMMETRIES TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN
LTSMIn	P/T	Par	DECISION_DIAGRAMS EXPLICIT USE_NUPN
MCC4MCC.full	P/T & Col	Colat & seq	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION SAT_SMT STATE_COMPRESSION STRUCTURAL_REDUCTION STUBBORN_SETS SYMMETRIES TAUTOLOGY TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN
MCC4MCC.struct	P/T & Col	Colat & seq	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION SAT_SMT STATE_COMPRESSION STRUCTURAL_REDUCTION STUBBORN_SETS SYMMETRIES TAUTOLOGY TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN
Tapaal	P/T & Col	Colat	CPN_APPROX CTL_CZERO EXPLICIT LP_APPROX QUERY_REDUCTION SAT_SMT SIPHON_TRAP STATE_COMPRESSION STRUCTURAL_REDUCTION STUBBORN_SETS TOPOLOGICAL TRACE_ABSTRACTION_REFINEMENT UNFOLDING_TO_PT
Irma.full	P/T & Col	Colat	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION SAT_SMT STATE_COMPRESSION STRUCTURAL_REDUCTION STUBBORN_SETS SYMMETRIES TAUTOLOGY TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN
Irma.struct	P/T & Col	Colat	BMC DECISION_DIAGRAMS EXPLICIT INITIAL_STATE K_INDUCION SAT_SMT STATE_COMPRESSION STRUCTURAL_REDUCTION STUBBORN_SETS SYMMETRIES TAUTOLOGY TOPOLOGICAL UNFOLDING_TO_PT USE_NUPN

**מבחן
2018**

Examinations

StateSpace

UpperBound

Reachability

ReachabilityDeadlock

ReachabilityCardinality

ReachabilityFireability

→ atomic propositions refer to tokens

→ atomic propositions refer to firing

CTL

CTLCardinality

CTLFireability

→ atomic propositions refer to tokens

→ atomic propositions refer to firing

LTL

LTLCardinality

LTLFireability

→ atomic propositions refer to tokens

→ atomic propositions refer to firing

 Tools improve every year

Tool participation per examination	2011	2012	2013	2014	2015	2016	2017	2018
Participating	10	9(+1)	9(+2)	9	10(+3)	10(+2)	9(+1)	9(+3)
Supporting Colored nets	4	4	4	2	4	2	8	10
Supporting NUPN				1	3	3	4	10
StatesSpace	7	7	7	7	11	10	8	11
UpperBound						7	6	11
Struct. formulas	3	2						
Reachability	5	5	8	5	10	8	6	10
CTL		0	7	2	2	5	6	10
LTL		0	6	1	0	4	4	8

Answered examinations

15,60 % 22,22 % 26,30 % 40,47 %

**מכון
2018**

Schedule & Tool confidence

🕒 ~April 15, delivery of disk images

- 🕒 Qualification phase
- 🕒 Completed by early May
 - ▶ ~37 000 test runs

🕒 May 16, starting to operate tools

- 🕒 **102 216** runs distributed on 7 different machines over Europe
- 🕒 VM with 4 cores / 16GB
 - ▶ ITS-Tools, ITS-Tools.L, LoLa, LTSMin, M4M.struc, M4M.full, Tapaal
 - ▶ Irma.struct, Irma.full
- 🕒 WM with 1 core / 16 GB
 - ▶ GreatSPN-meddlly, smart, TINA.tedd
- 🕒 Time confinement, 1h
- 🕒 Only **physical cores** allocated to VMs

🕒 June 7, feedback sent to developers about their tool

🕒 Mid June, consolidation + analysis of outcomes

🕒 29 GByte of logs and CSV files

▶ Post analysis = ~18KLOC Ada + ~800 LOC bash

🕒 Analysis process

🕒 Pass 1, computing results for the majority in a «line»

▶ All tools for an examination for a model instance

🕒 Pass 2, evaluating tool confidence

▶ Only considering values with a large majority

🕒 Pass 3, reconstructing the results using tool confidence

▶ Help to decide when only 2 different answers

▶ A result must be of confidence 0.97 or more (0.95 in 2016)

▶ Some results are tagged «insecure»

🕒 Pass 4 computing scores

▶ «insecure» results not considered when counting points

Mid June, consolidation + analysis of outcomes

- 29 GByte of logs and CSV files

► Post analysis = ~18KLOC Ada + ~8

Scoring (normalization)
per examination, [102..221] points

Analysis process

- Pass 1, computing results for the majority in a «line»
 - All tools for an examination for a model instance
- Pass 2, evaluating tool confidence
 - Only considering values with a large majority
- Pass 3, reconstructing the results using tool confidence
 - Help to decide when only 2 different answers
 - A result must be of confidence 0.97 or more (0.95 in 2016)
 - Some results are tagged «insecure»
- Pass 4 computing scores
 - «insecure» results not considered

Award
Road Runner
Camel

Penalty for mistakes
Twice the score for a good value

Consistency checks

- Colored versus equivalent P/T nets

Computing the «confidence rate»

- Section III.2 in <http://mcc.lip6.fr/rules.php>
- Computing V , the set of values with a **majority of 3 or more tools**
- For each tool t , selecting V_t , the values computed $\in V$
- For each tool t , selecting $V_{\#}$, the correct values computed $\in V_t$
- Confidence rate = $\frac{|V_{\#}|}{|V_t|}$

MCC 2018 Global Tool Confidence

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Tools	Confidence	success	selected	Examinations
GreatSPN	100,00 %	30783	30783	7 (not LTL)
smart	100,00 %	6133	6133	2 (StateSpace, UpperBound)
TINA.tedd	99,71 %	2084	2090	1 (State Space)
ITS-Tools	100,00 %	61639	61641	All 9
ITS-Tools.L	100,00 %	59498	59500	All 9
LoLA	99,99 %	68795	68801	8 (not StateSpace)
LTSMin	99,97 %	47235	47249	All 9
M4M.full	99,97 %	33462	33472	All 9
M4M.struct	99,98 %	34898	34903	All 9
Tapaal	99,99 %	47183	47186	7 (not LTL)
Irma.full	100,00 %	39038	39038	All 9
Irma.struct	100,00 %	39097	39097	All 9

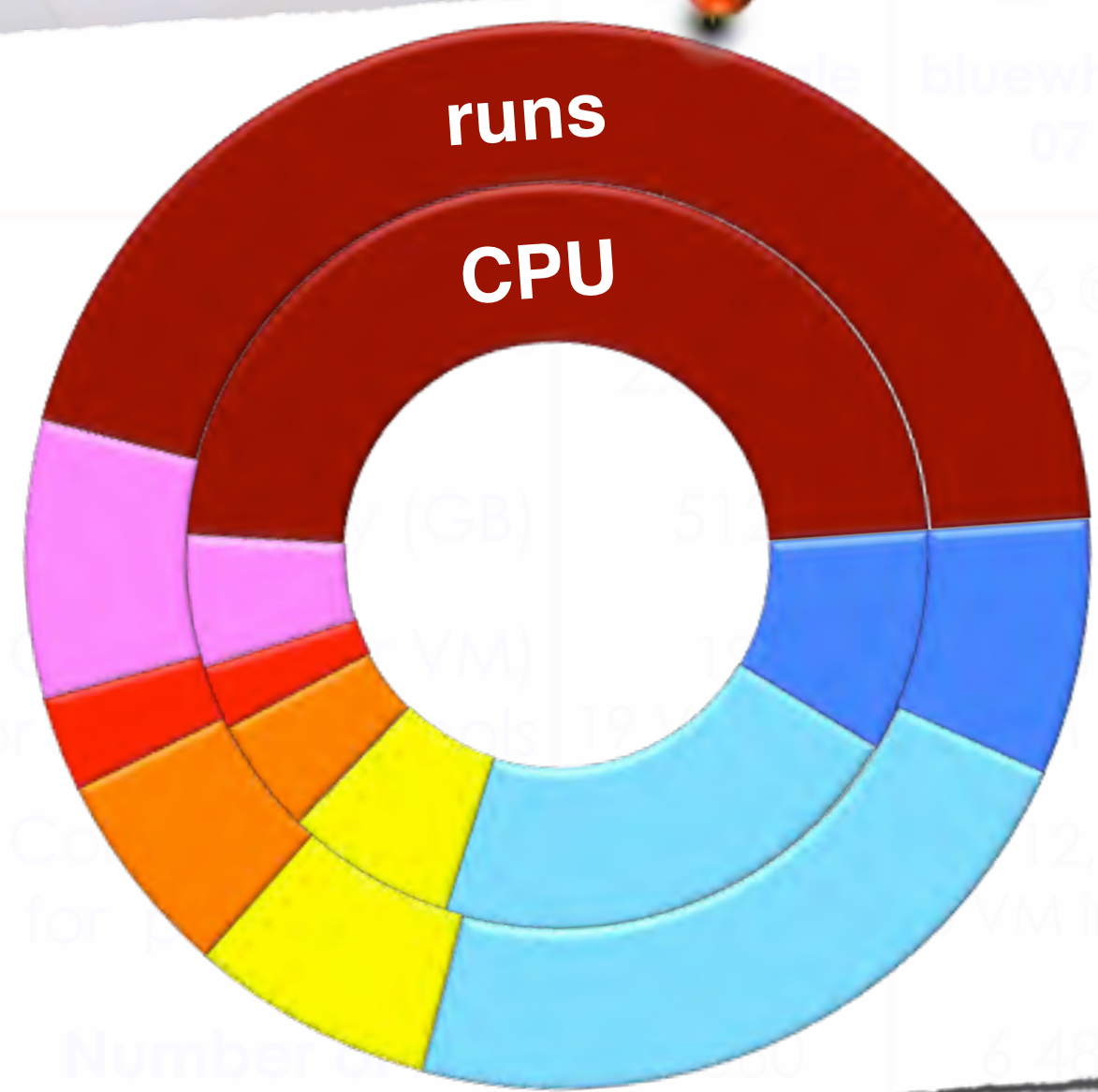
Evolution of the confidence since it was introduced

	2015	2016	2017	2018
smallest confidence	62,30 %	37,40 %	79,59 %	99,71 %
average confidence	89,65 %	94,20 %	97,34 %	99,97 %
highest confidence	100 %	99,99 %	100 %	100 %



Tools are improving
Industrial quality!

	 bluewhale 03	 bluewhale 07	 Caserta	 Ebro	 Quadhexa -1	 Quadhexa -2	 Small (root) (cluster)	Total
Physical cores	40 @ 2.8GHz	16 @ 3.2GHz	96 @ 2.20GHz	32 @ 2.7GHz	24 @ 2.66GHz	24 @ 2.66GHz	16x12 @ 2.4GHz	-
Memory (GB)	512	1024	1024	1024	144	128	16x64	-
Cores (1 per VM) for sequential tools	19 19 VM in //	15 15 VM in //	95 95 VM in //	31 31 VM in //	7, 7 VM in //	7, 7 VM in //	16x3, 16x3 VM //	-
Cores (4 per VM) for parallel tools	16, 4 VM in //	12, 3 VM in //	92, 23 VM in //	28, 7 VM in //	20 4 VM in //	20 4 VM in //	16x8, 12x2 VM //	-
Number of runs	7 560	6 480	22 896	7 992	2 916	8 640	45 792	102 276
Total CPU required	127d, 20h, 32m, 8s	88d, 19h, 33m, 13s	369d, 2h, 22m, 38s	168d, 20h, 32m, 4s	47d, 20h, 50m, 37s	100d, 2h, 1m, 15s	832d, 13h, 25m, 14s	1735d, 3h, 17m, 9s
Total CPU	about 4 years, 9 months and 1 day							-
Time spent to complete benchmarks	about 21 days							-
VM boot time of VMs + management (overhead)	About 17d, 18h (Included in total CPU)							-



- ebro runs
- caserta runs
- bluewhale3 runs
- bluewhale7 runs
- quadhexa1 runs
- quadhexa2 runs
- small runs

Ebro	Quadhexa -1	Quadhexa -2	Small (root) (cluster)	Total
More CPU than in 2017				
102 276 runs this year				
31 VM in //	7 VM in //	7 VM in //	16x3 VM //	
28, VM in //	20 4 VM in //	20 4 VM in //	16x8, 12x2 VM //	-
			45 792	102 276

Thank you very much

Université de Genève
 University of Twente
 Rostock University
 Université Nanterre
 Sorbonne Université

Total CPU required	127d, 20h, 32m, 8s	88d, 19h, 33m, 13s	
Total CPU			
Time spent to complete benchmarks			
VM boot time of VMs + management (overhead)			

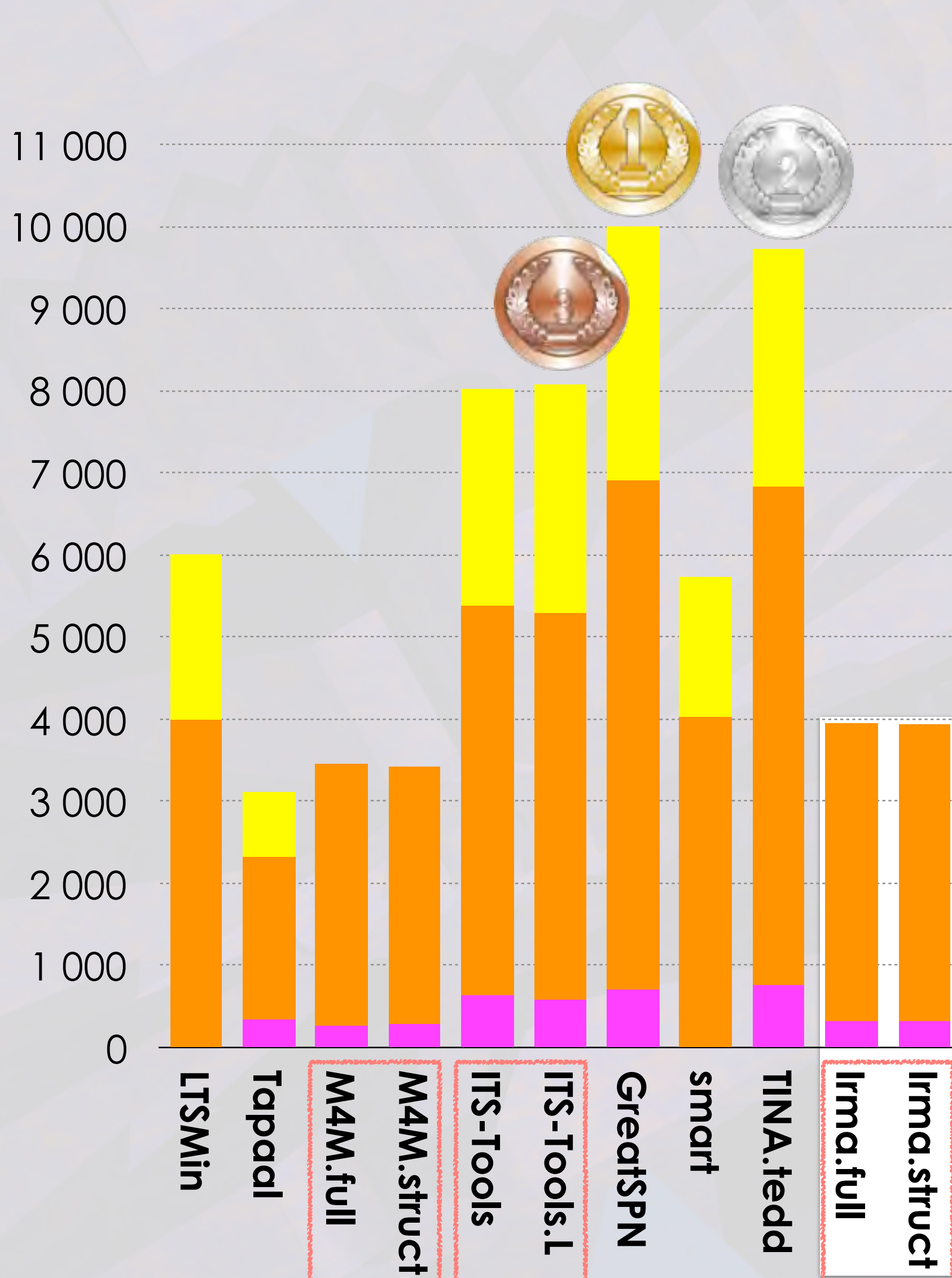
**מכון
2018**

Results

MCC 2018 StateSpace Examination



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■ Surprise&P/T
■ Surprise&Colored
■ Known&P/T
■ Known&Colored

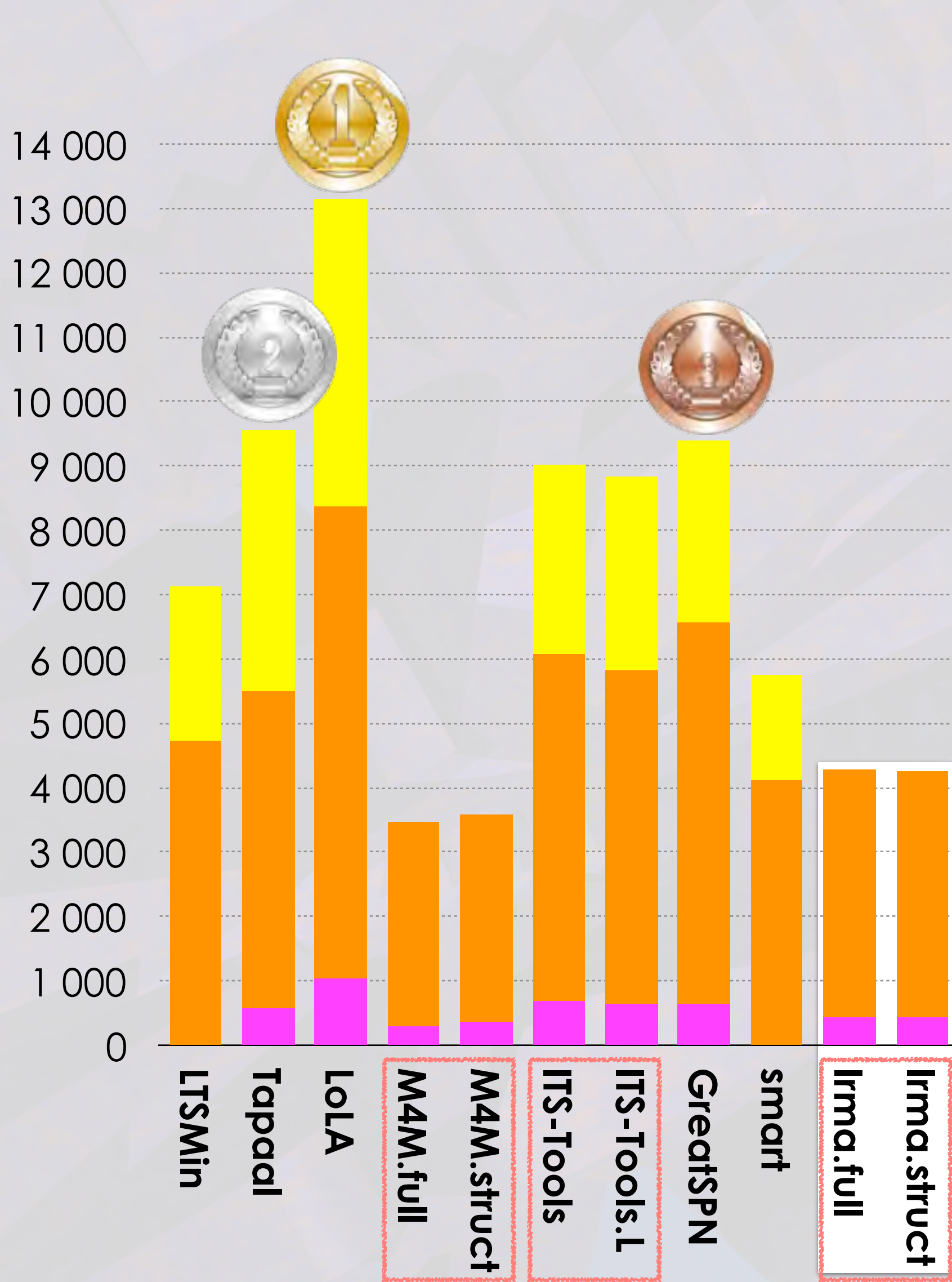


GreatSPN



GreatSPN

StateSpace	confidence	success	selected
LTSMin	99,68 %	942	945
Tapaal	100,00 %	630	630
M4M.full	100,00 %	907	907
M4M.struct	100,00 %	894	894
ITS-Tools	100,00 %	1506	1506
ITS-Tools.L	100,00 %	1425	1425
GreatSPN	100,00 %	2075	2075
smart	100,00 %	1212	1212
TINA.tedd	99,71 %	2084	2090
Irma.full	100,00 %	1022	1022
Irma.struct	100,00 %	1019	1019



- Surprise&P/T
- Surprise&Colored
- Known&P/T
- Known&Colored

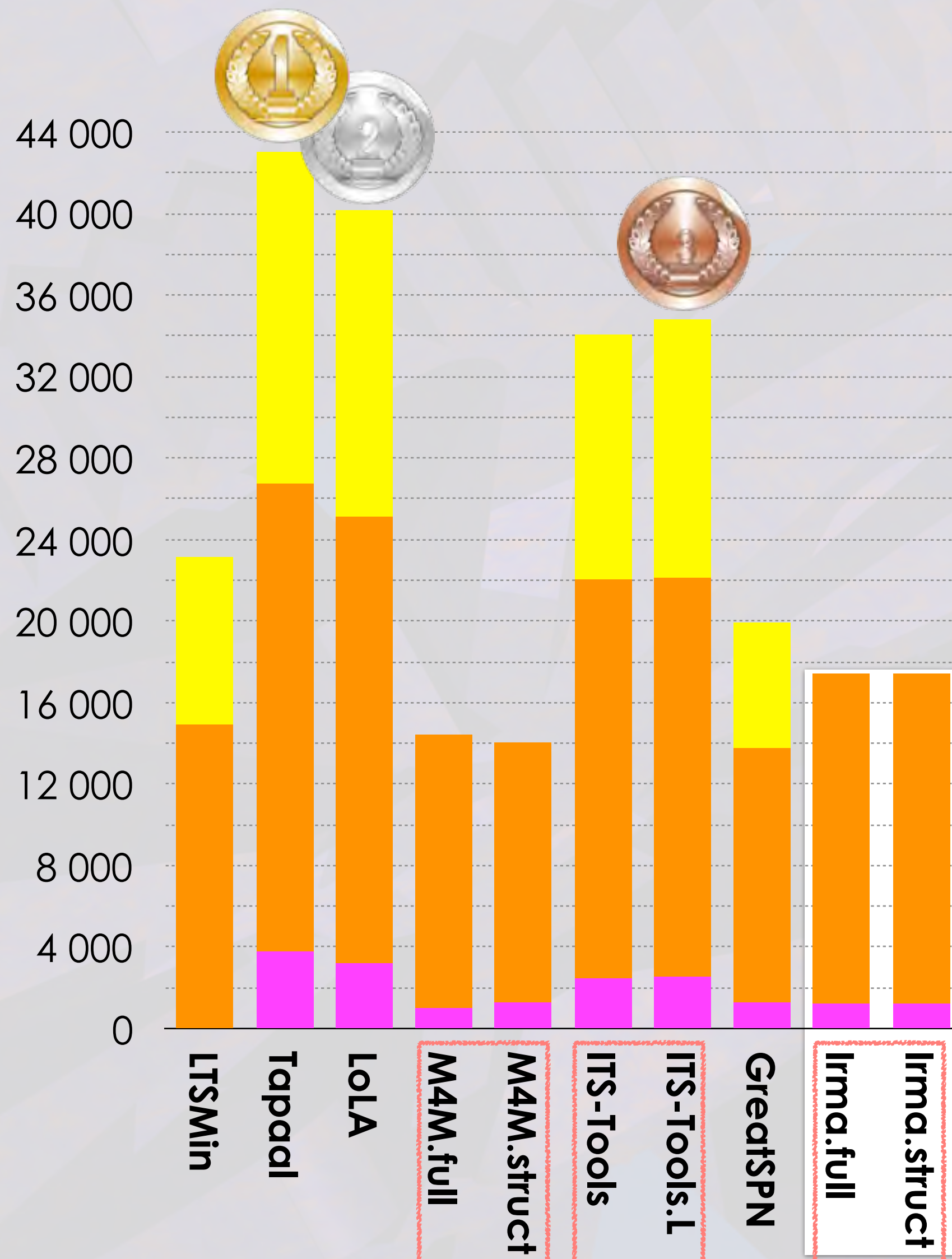


LoLA



LoLA

UpperBound	confidence	success	selected
LTSMin	100,00 %	5328	5328
Tapaal	99,98 %	7439	7441
LoLA	100,00 %	8826	8826
M4M.full	99,98 %	3788	3789
M4M.struct	99,98 %	3857	3858
ITS-Tools	100,00 %	8170	8170
ITS-Tools.L	100,00 %	7375	7375
GreatSPN	100,00 %	8541	8541
smart	100,00 %	4921	4921
Irma.full	100,00 %	4926	4926
Irma.struct	100,00 %	4901	4901



- Surprise&P/T
- Surprise&Colored
- Known&P/T
- Known&Colored



LoLA



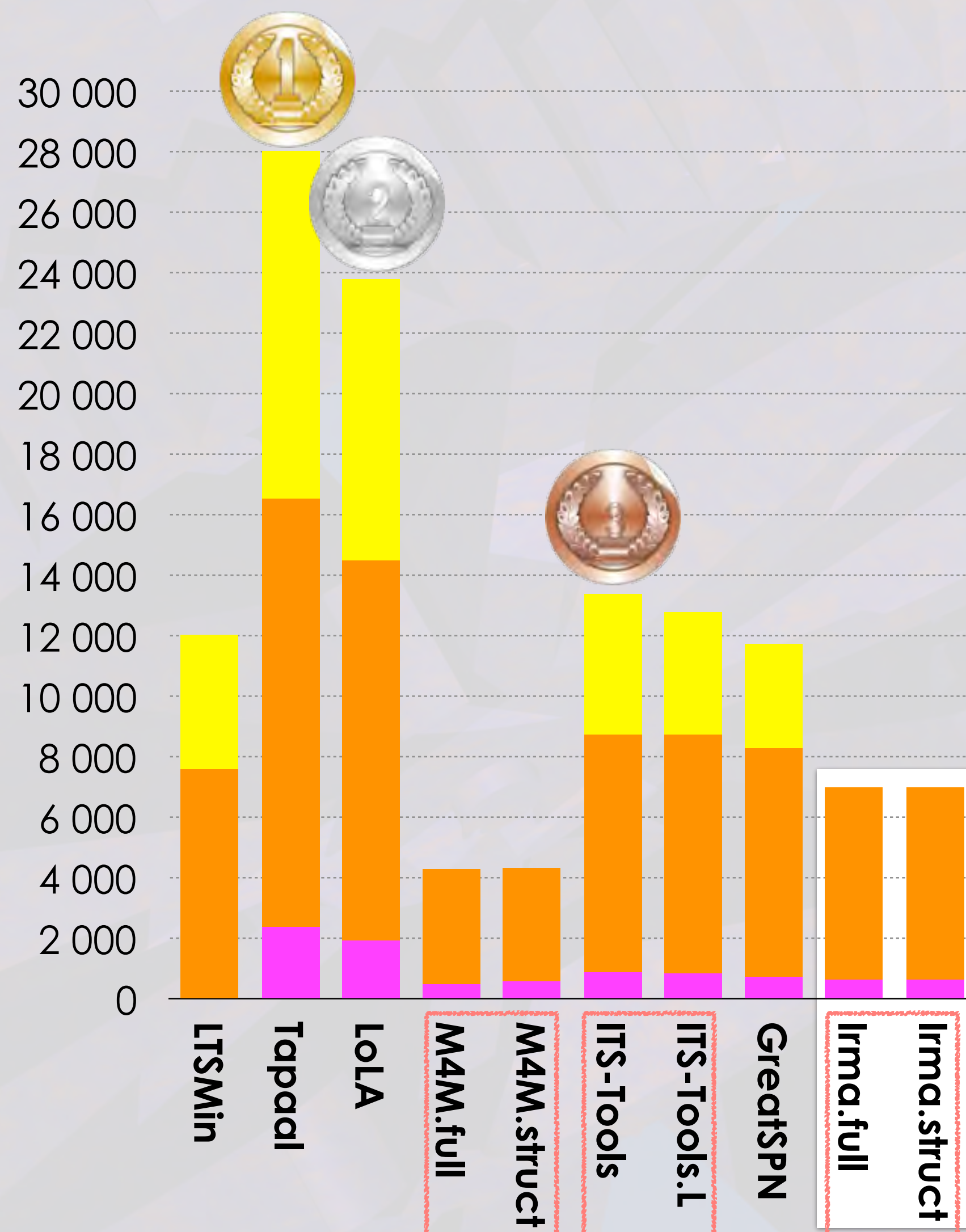
Tapaal

Reachability	confidence	success	selected
LTSMin	99,93 %	13418	13428
Tapaal	100,00 %	25131	25131
LoLA	100,00 %	24242	24242
M4M.full	100,00 %	12533	12533
M4M.struct	100,00 %	13012	13012
ITS-Tools	100,00 %	20459	20459
ITS-Tools.L	100,00 %	19894	19894
GreatSPN	100,00 %	10350	10350
Irma.full	100,00 %	13993	13993
Irma.struct	100,00 %	13977	13977

MCC 2018 CTL Examinations



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- Surprise&P/T
- Surprise&Colored
- Known&P/T
- Known&Colored



Tapaal



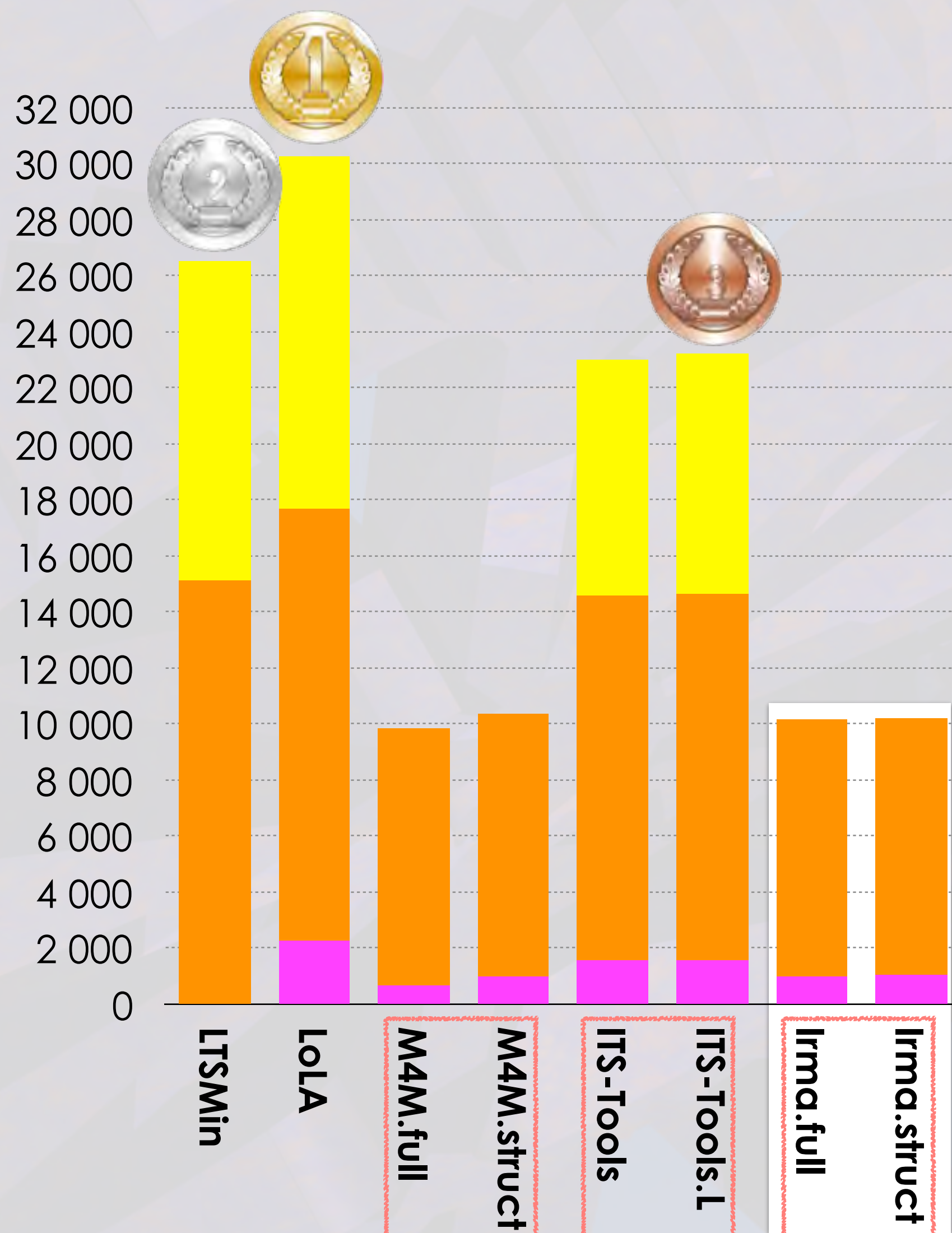
GreatSPN

CTL	confidence	success	selected
LTSMIn	99,99 %	8641	8642
Tapaal	99,99 %	13983	13984
LoLA	99,96 %	12751	12756
M4M.full	99,82 %	4878	4887
M4M.struct	99,92 %	5126	5130
ITS-Tools	100,00 %	11215	11215
ITS-Tools.L	100,00 %	10554	10554
GreatSPN	100,00 %	9817	9817
Irma.full	100,00 %	7224	7224

MCC 2018 LTL Examinations



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- Surprise&P/T
- Surprise&Colored
- Known&P/T
- Known&Colored



LoLA



LoLA

LTL	confidence	success	selected
LTSMin	100,00 %	18906	18906
LoLA	100,00 %	22976	22977
M4M.full	100,00 %	11356	11356
M4M.struct	100,00 %	12009	12009
ITS-Tools	99,99 %	20289	20291
ITS-Tools.L	99,99 %	20250	20252
Irma.full	100,00 %	11873	11873
Irma.struct	100,00 %	11947	11947



- **No change in the podium at all**
- **Changes in the values only**

Computation of a polynôme to evaluate the size of a state space

Automatically generated by TINA.tedd for Kanban (X = parameter)

$$\begin{aligned} & \frac{1}{720}X^{11} + \frac{11}{360}X^{10} + \frac{649}{2160}X^9 + \frac{209}{120}X^8 \\ & + \frac{4757}{720}X^7 + \frac{413}{24}X^6 + \frac{7531}{240}X^5 + \frac{14413}{360}X^4 \\ & + \frac{37813}{1080}X^3 + \frac{1199}{60}X^2 + \frac{67}{10}X + 1 \end{aligned}$$

Springer Link



[International Symposium on Model Checking Software](#)

SPIN 2018: [Model Checking Software](#) pp 65-84 | [Cite as](#)

Petri Net Reductions for Counting Markings

Authors

[Authors and affiliations](#)

Bernard Berthomieu, Didier Le Botlan , Silvano Dal Zilio

Conference paper

First Online: 16 June 2018

Part of the [Lecture Notes in Computer Science](#) book series (LNCS, volume 10869)

Abstract

We propose a method to count the number of reachable markings of a Petri net without having

**מכון
2018**

Conclusive remarks

MCC 2018 Detailed HTML Report

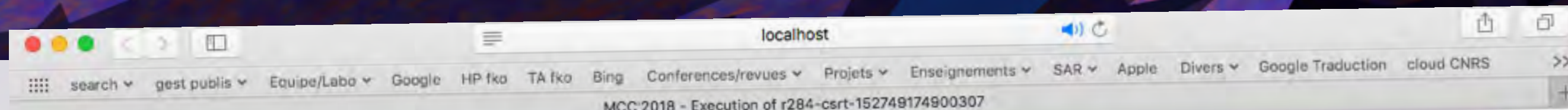
33

85 520 generated web pages

HospitalTriage — P/T												
Score	LTSMIn	Tapaal	LoLA	M4M.full	M4M.struct	ITS-Tools	ITS-Tools.L	GreatSPN	smart	TINA.tedd	Irma.full	Irma.struct
Road Runner	0	0	0	0	0	0	356	408	0	408	0	0
Camel	0	0	0	0	0	0	0	1	0	0	0	0
none	1.7342E+0020 ? 4 61 T-TT -- / 356	CC 0	CC 0	CC 0	CC 0	CC 0	1.7342E+0020 ? 4 61 T-TT -- / 356	3.5036E+0021 4 61 TTTT --PM / 408	DNF 0	1.7342E+0020 3.5036E+0021 4 61 TTTT -- / 408	CC 0	CC 0
MAPKbis — P/T												
Score	LTSMIn	Tapaal	LoLA	M4M.full	M4M.struct	ITS-Tools	ITS-Tools.L	GreatSPN	smart	TINA.tedd	Irma.full	Irma.struct
Road Runner	0	0	0	0	0	0	368	424	212	424	0	0
Camel	0	0	0	0	0	0	0	2	0	0	0	0
5310	3.8464E+0012 ? 1 53 T-TT -- / 184	CC 0	CC 0	CC 0	CC 0	3.8464E+0012 ? 1 53 T-TT -- / 184	3.8464E+0012 ? 1 53 T-TT -- / 184	3.8464E+0012 9.4861E+0013 1 53 TTTT --M / 212	DNF 0	3.8464E+0012 9.4861E+0013 1 53 TTTT --P / 212	CC 0	CC 0
5320	8.1265E+0006 ? 1 53 T-TT -- / 184	8.1265E+0006 ? 1 53 T-TT -- / 184	CC 0	CC 0	CC 0	8.1265E+0006 ? 1 53 T-TT -- / 184	8.1265E+0006 ? 1 53 T-TT -- / 184	8.1265E+0006 1.0158E+0008 1 53 TTTT --PM / 212	8.1265E+0006 1.0158E+0008 1 53 TTTT -- / 212	8.1265E+0006 1.0158E+0008 1 53 TTTT -- / 212	CC 0	CC 0
NQueens — P/T												
Score	LTSMIn	Tapaal	LoLA	M4M.full	M4M.struct	ITS-Tools	ITS-Tools.L	GreatSPN	smart	TINA.tedd	Irma.full	Irma.struct
Road Runner	0	3	0	0	0	0	156	172	180	120	0	0
Camel	0	2	0	0	0	0	0	1	0	0	0	0
05	462 ? 1 30 T-TT -- / 52	462 ? 1 30 T-TT --P / 52	CC 0	CC 0	CC 0	462 ? 1 30 T-TT -- / 52	462 ? 1 30 T-TT -- / 52	462 1295 1 30 TTTT --M / 60	462 1295 1 30 TTTT -- / 60	462 1295 1 30 TTTT -- / 60	CC 0	CC 0
08	1.1897E+0005 ? 1 48 T-TT -- / 52	1.1897E+0005 ? 1 48 T-TT --PM / 52	CC 0	CC 0	CC 0	1.1897E+0005 ? 1 48 T-TT -- / 52	1.1897E+0005 ? 1 48 T-TT -- / 52	1.1897E+0005 5.6488E+0005 1 48 TTTT -- / 60	1.1897E+0005 5.6488E+0005 1 48 TTTT -- / 60	1.1897E+0005 5.6488E+0005 1 48 TTTT -- / 60	CC 0	CC 0
10	7.5354E+0006 ? 1 60 T-TT -- / 52	7.5354E+0006 ? 1 60 T-TT --PM / 52	CC 0	CC 0	CC 0	7.5354E+0006 ? 1 60 T-TT -- / 52	7.5354E+0006 ? 1 60 T-TT -- / 52	7.5354E+0006 ? 1 60 T-TT -- / 60	7.5354E+0006 4.6240E+0007 1 60 TTTT -- / 60	DNF 0	CC 0	CC 0

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85 520 gener



Model Checking Contest 2018

8th edition, Bratislava, Slovakia, June 26, 2018

Execution of r284-csrt-152749174900307

Last Updated
June 18, 2018

About the Execution of ITS-Tools for NQueens-PT-05

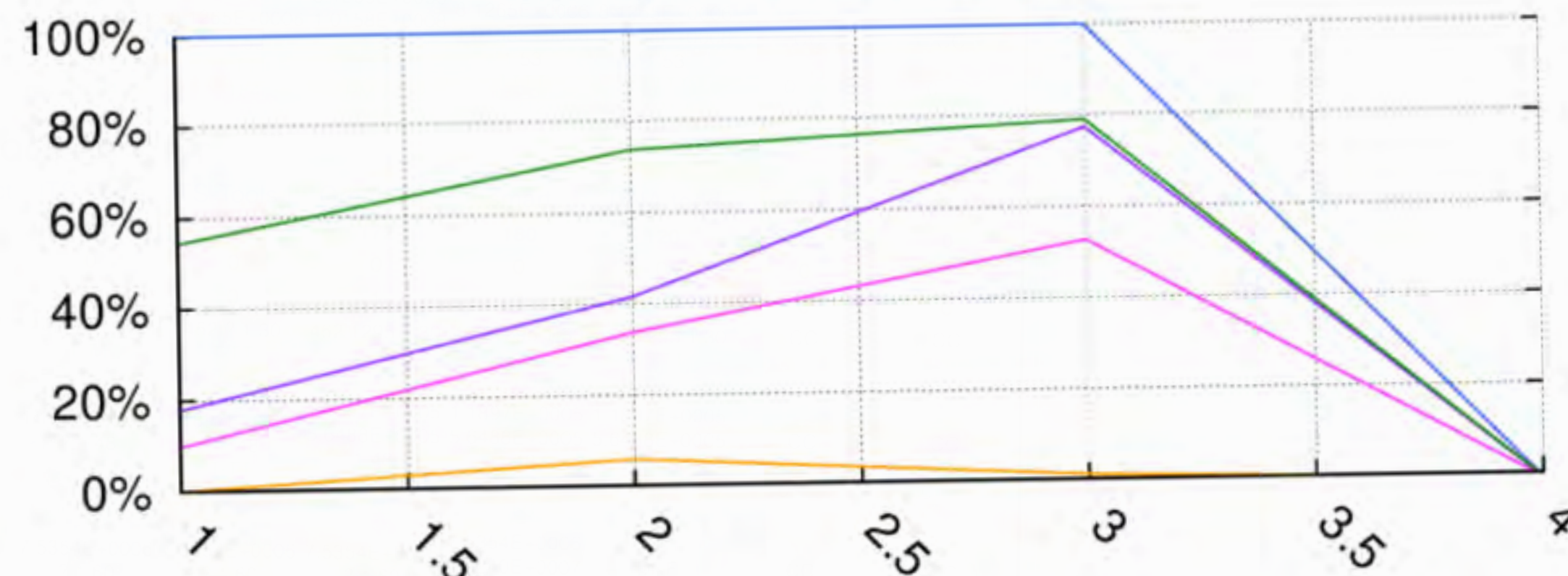
Execution Summary

Max Memory Used (MB)	Time wait (ms)	CPU Usage (ms)	I/O Wait (ms)	Computed Result	Execution Status
15757.060	2367.00	5170.00	68.20	462 ? 1 30	normal

Execution Chart

We display below the execution chart for this examination (boot time has been removed).

Resources Consumption for ITS-Tools
StateSpace on NQueens-PT-05



2018/06/18, 21:27

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Some statistics are displayed below, based on **1894** runs (947 for GreatSPN and 947 for M4M.struct, so there are 947 plots on each of the two charts). Each execution was allowed **1 hour** and **16 GByte** of memory. Then performance charts comparing GreatSPN to M4M.struct are shown (you may click on one graph to enlarge it).

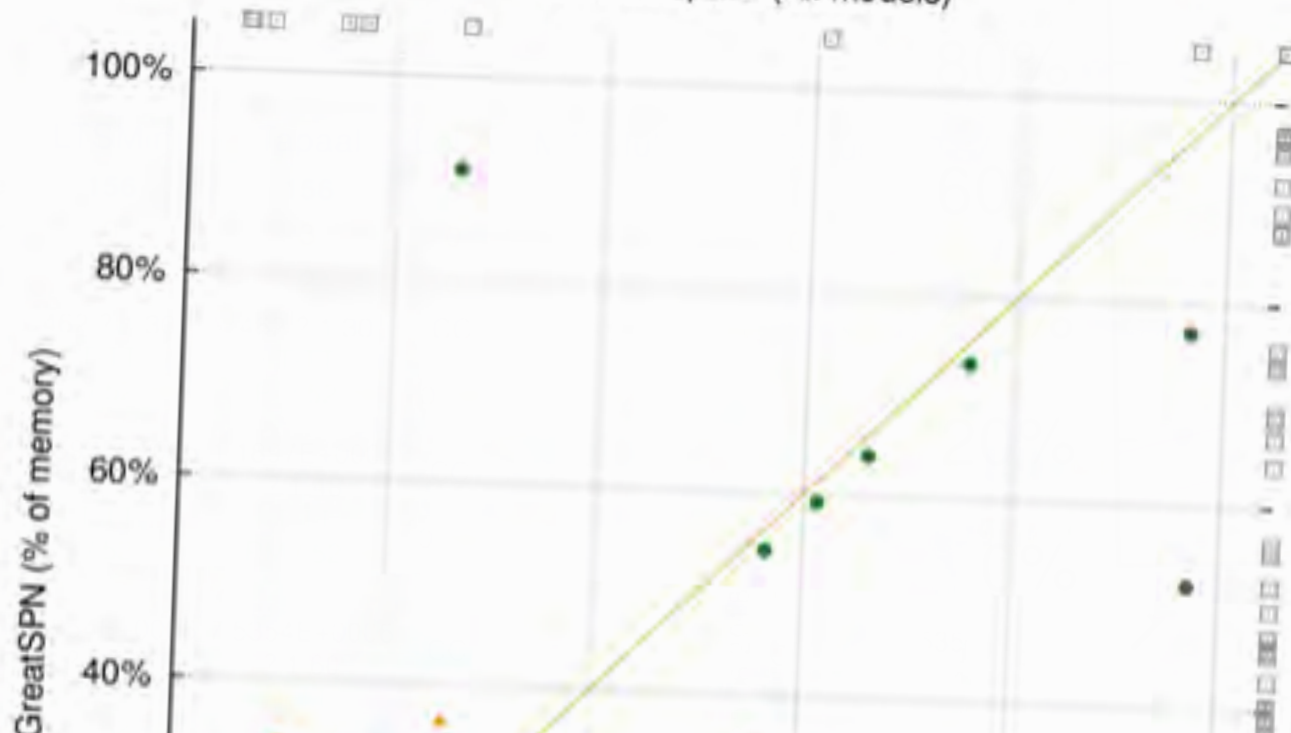
Statistics on the execution			
	GreatSPN	M4M.struct	Both tools
All computed OK	346	8	169
GreatSPN = M4M.struct	—	—	2
GreatSPN > M4M.struct	—	—	67
GreatSPN < M4M.struct	—	—	0
Do not compete	0	0	0
Error detected	0	0	0
Cannot Compute + Time-out	8	346	355

	GreatSPN	M4M.struct
Smallest Memory Footprint	568	24
Shortest Execution Time	557	35

On the chart below, ● denote cases where the two tools did computed all results without error, ● denote cases where the two tool did computed the same number of values (but not al values in the examination), ▲ denote cases where GreatSPN computed more values than M4M.struct, ▼ denote cases where GreatSPN computed less values than M4M.struct, ◆ denote the cases where at least one tool did not competed, ○ denote the cases where at least one tool computed a bad value and □ denote the cases where at least one tool stated it could not compute a result or timed-out.

GreatSPN wins when points are below the diagonal, M4M.struct wins when points are above the diagonal.

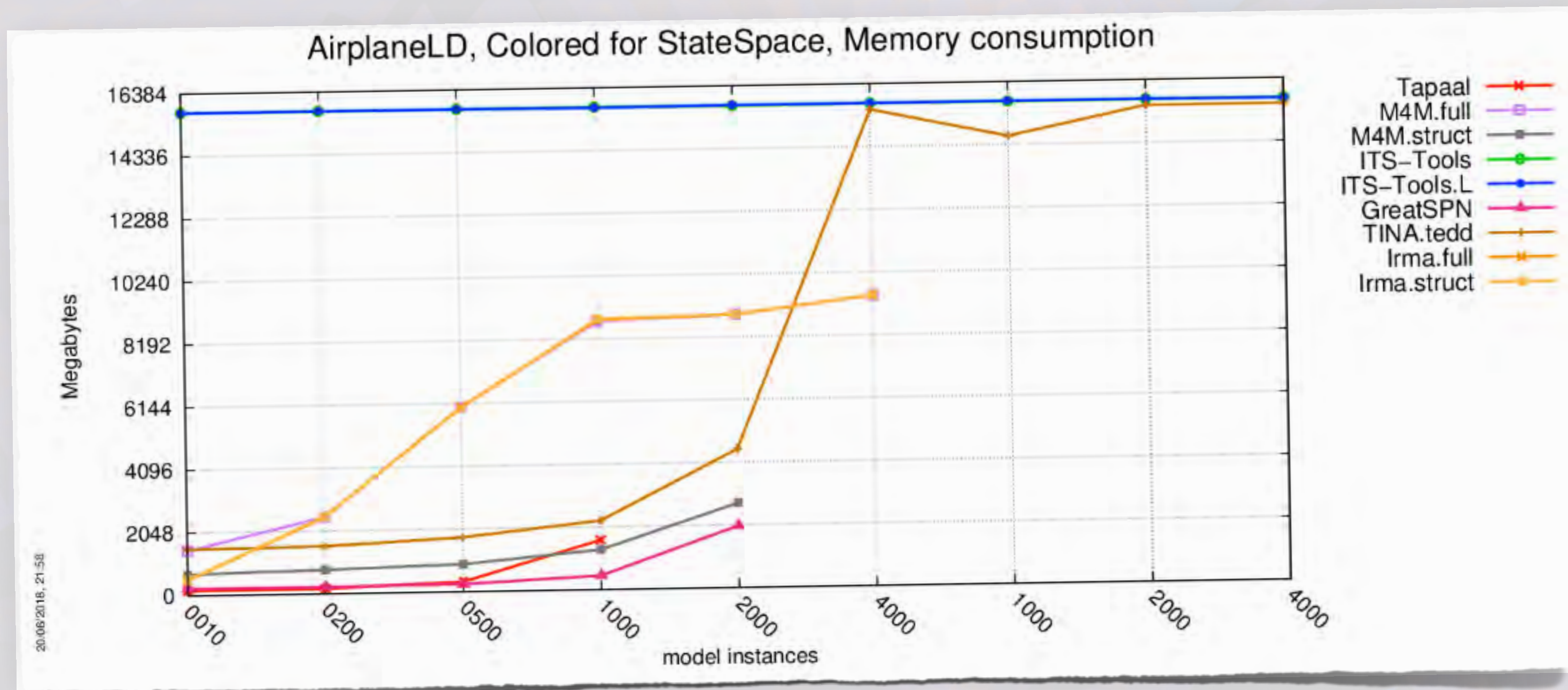
Max memory, GreatSPN versus M4M.struct for StateSpace (All models)



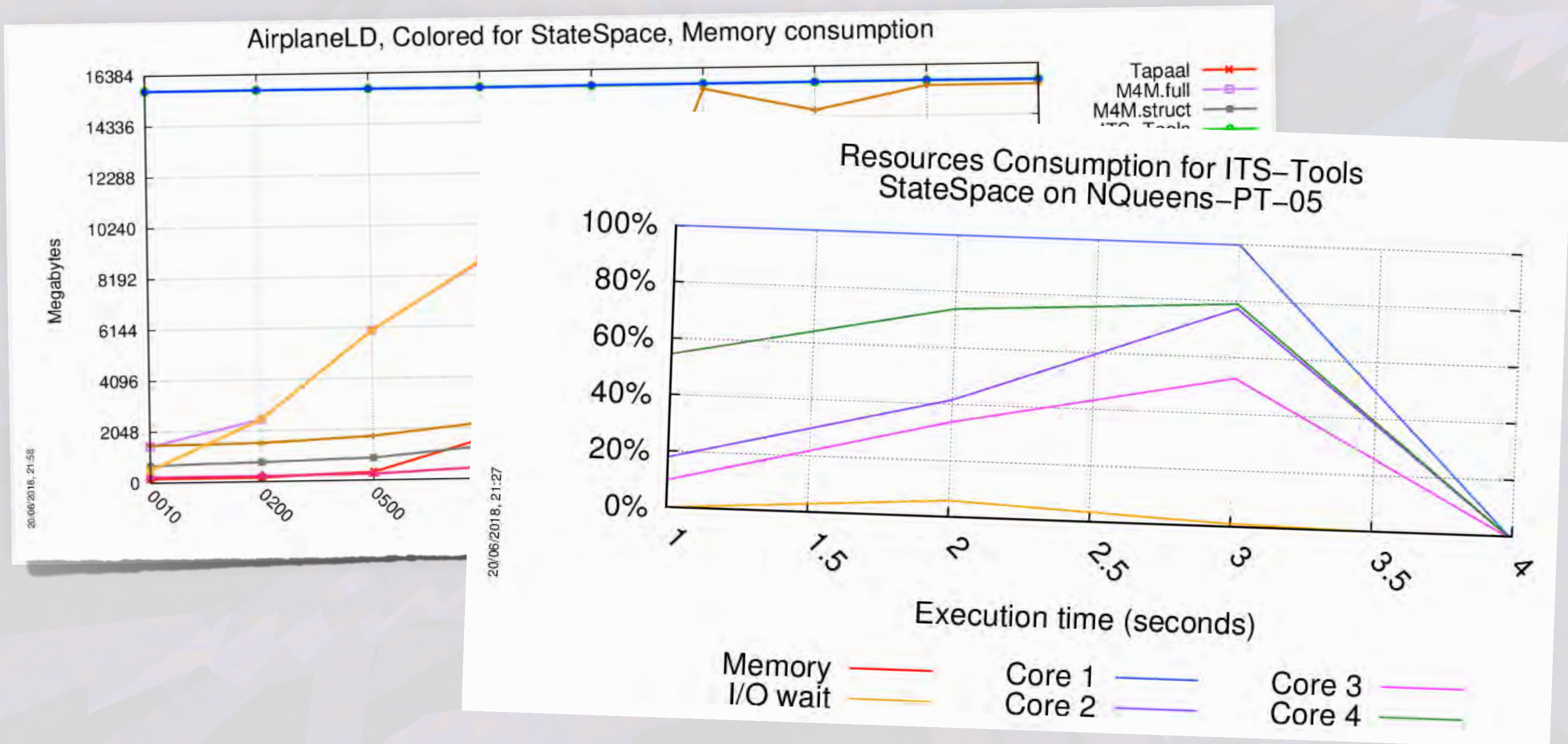
Execution time, GreatSPN versus M4M.struct for StateSpace (All models)



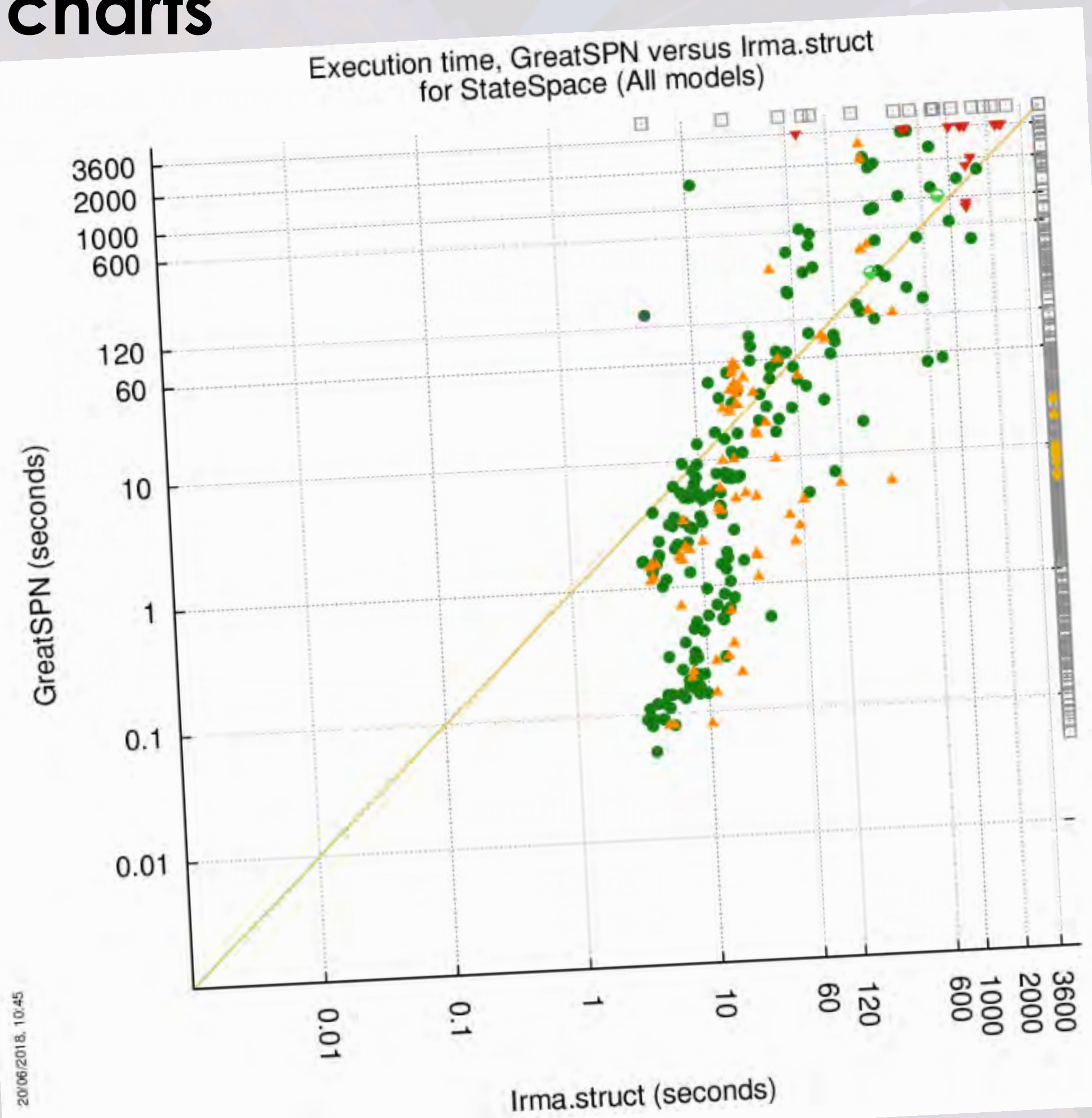
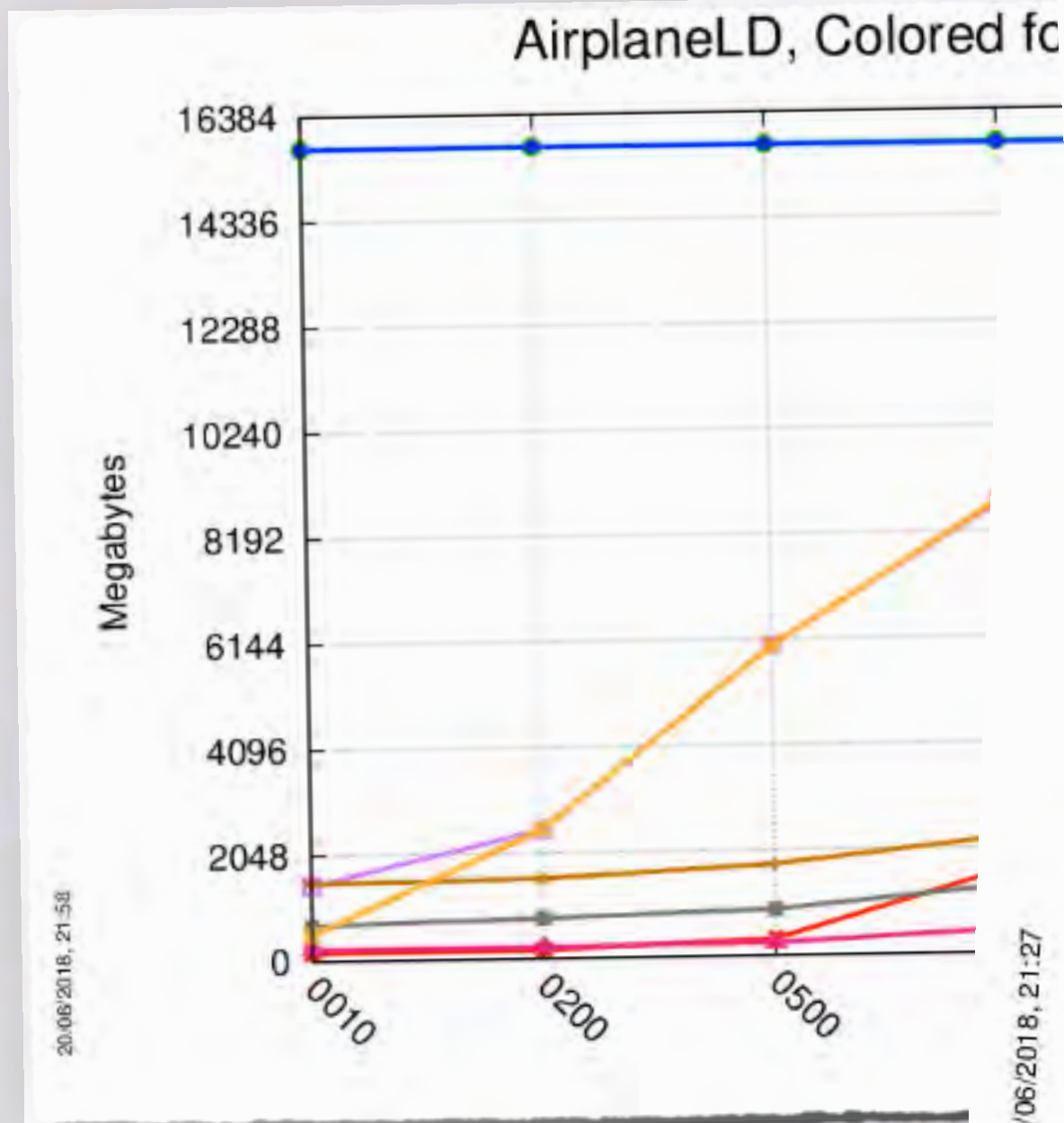
88 867 generated charts



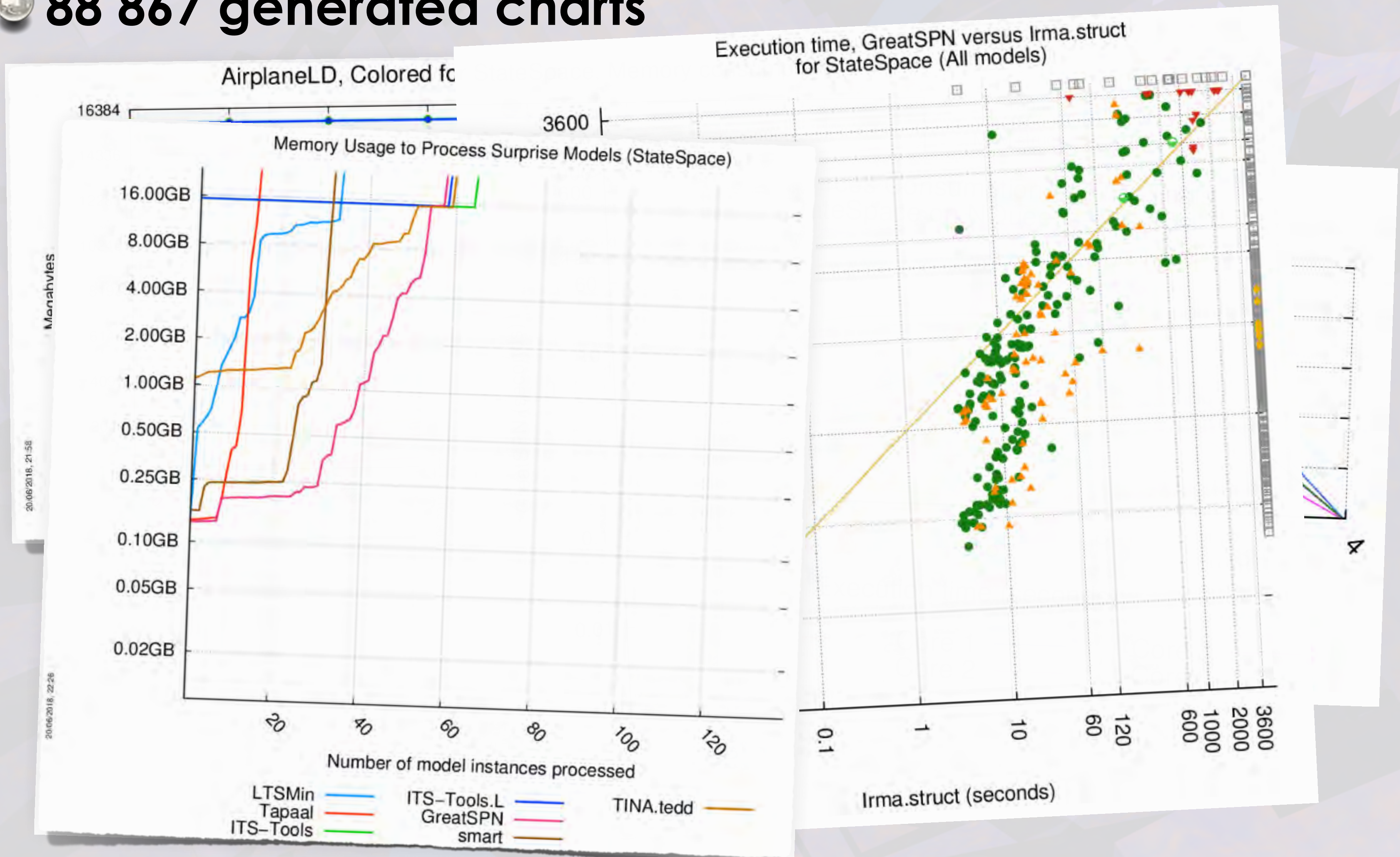
88 867 generated charts



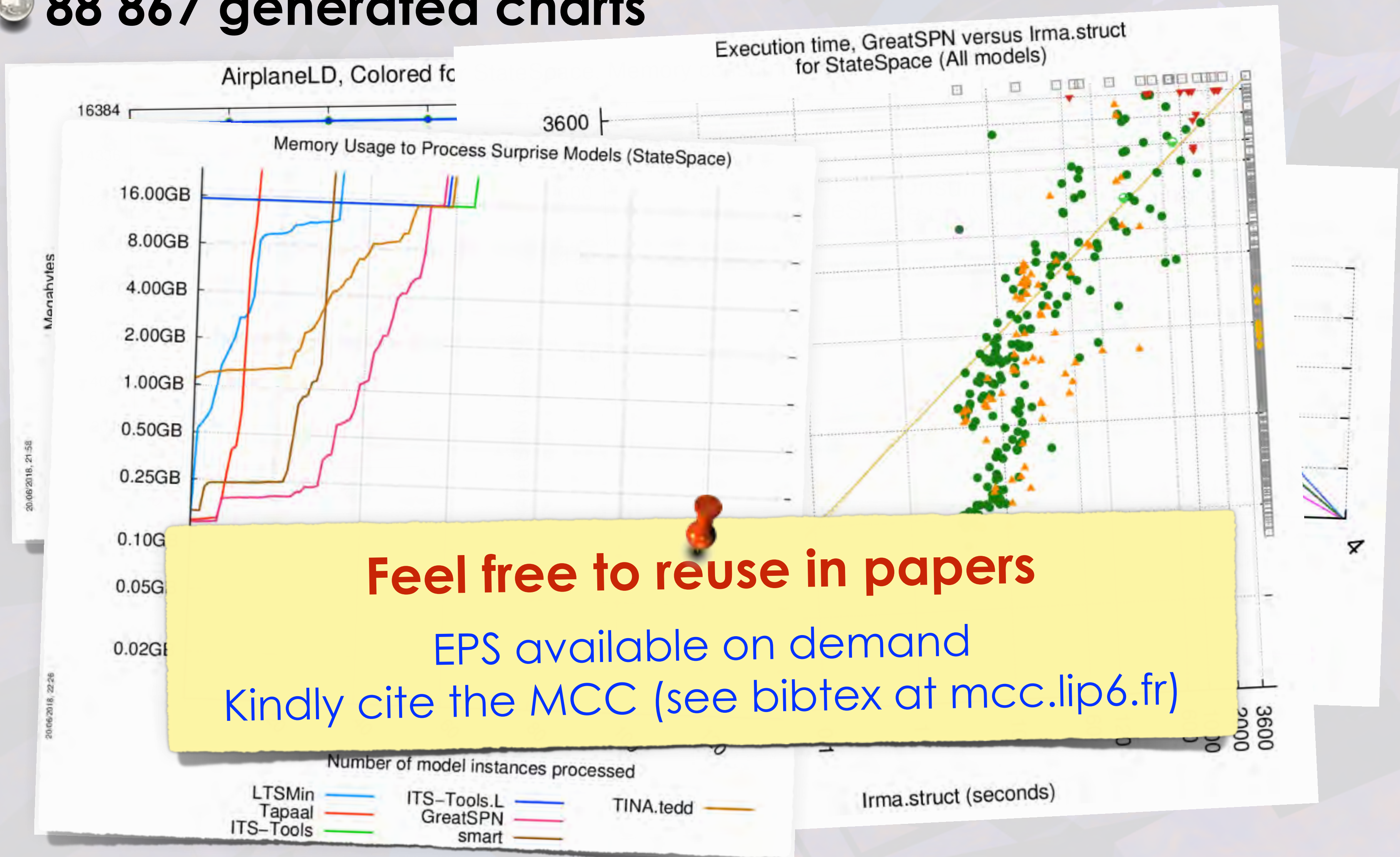
88 867 generated charts



88 867 generated charts



88 867 generated charts



 Handling some rare bugs in models

-  Optimized unfolding used by mistake (BART)
-  Unexpected infinite instances in RefineWG

 Improving Verdicts

-  Instance based verdict

MCC
2018 Next year?

Similar conditions

Model submission & tool
submission

Common presentations

1 or 2 days devoted to
contests

Deadlines pushed 2 month ahead

But better visibility for tools

TOOLYMPICS 2019

April 2019

Prague, Czech Republic

<https://tacas.info/toolympics.php>

Organizers

D. Beyer — Ludwig-Maximilians-Universität, Germany
H. Garavel — INRIA, France
M. Huisman, — University of Twente, The Netherlands
F. Kordon — Sorbonne Université, France
Firstname Lastname — institution, country
M. Sighireanu — Université Paris Diderot, France
B. Steffen — Tech. Universität Dortmund, Germany
M. Suda — University of Manchester, UK
T. Weber — Uppsala Universitet, Sweden

Involved Competitions

Model Checking Contest
RERS Challenge
Rewrite Engines Competition
Runtime Verification competition
SAT Competition
Separation Logic Competition
SMT-COMP
SV-COMP
VerifyThis



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And now...

let's have time for discussion

**INCC
2018**