



Model Checking Contest results for 2025

Fabrice Kordon — LIP6, Sorbonne Université, France

Francis Hulin-Hubard (CNRS)

Loïc Jézéquel (Université de Nantes)

Quentin Nivon (Inria)

Emmanuel Paviot-Adet (Université Paris Cité)



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MCC in a nutshell



Qualification phase



Execution phase



Consolidation phase



Construction of results

Home Calls Models Results Publications Committees Rules Previous Editions

Model Checking Contest 2024

14th edition, Geneva, Switzerland, June 25, 2024

Complete Results for the 2024 Edition of the Model Checking Contest

Last Updated June 16, 2024

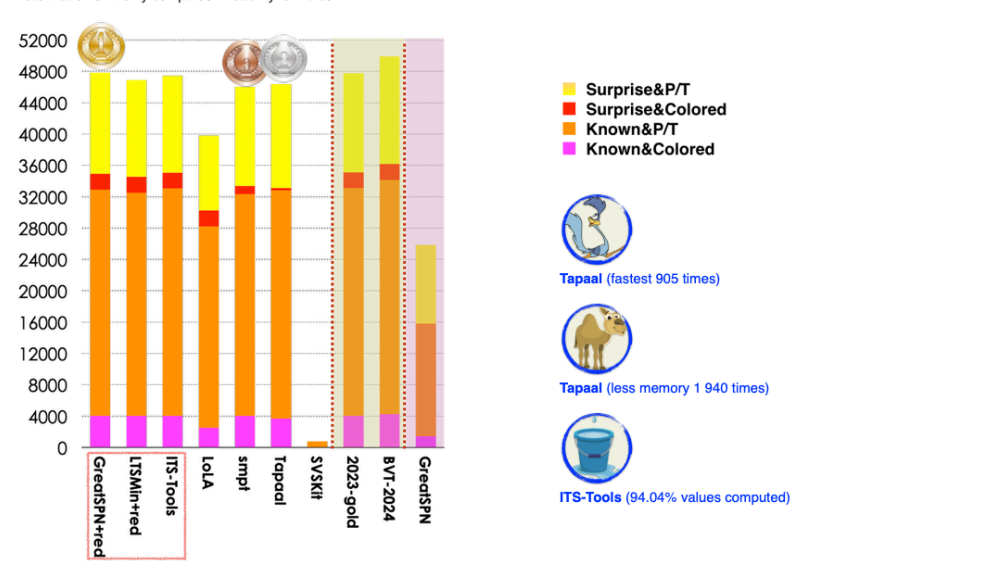
5.4. Winners in the Reachability Formulas Category

8 tools out of 11 participated in these examinations (ReachabilityCardinality and ReachabilityFireability). Results based on the scoring shown below is:

- **LTSMin+red** ranked first (47826 pts, 93.90% of computed values),
- **Tapaal** ranked second (46358 pts, 93.19% of computed values),
- **smtp** ranked third (46015 pts, 92.15% of computed values).

Then ITS-Tools got 47441 pts (94.04% of computed values), LTSMin+red got 46871 pts (92.49% of computed values), LoLA got 46871 pts (92.49% of computed values), SVSKit got 801 pts (4.80% of computed values), and GreatSPN got 25880 pts (45.61% of computed values). The total collected 47766 pts (94.56% of computed values). BVT-2024 (Best Virtual Tool) collected 4906 pts and computed 97.76% of the total number of values in this category.

Note that SVSKit only computes Fireability formulas.



Estimated Tool Confidence rate for Reachability (based on the -significant values- computed by tools) see section 6 for details

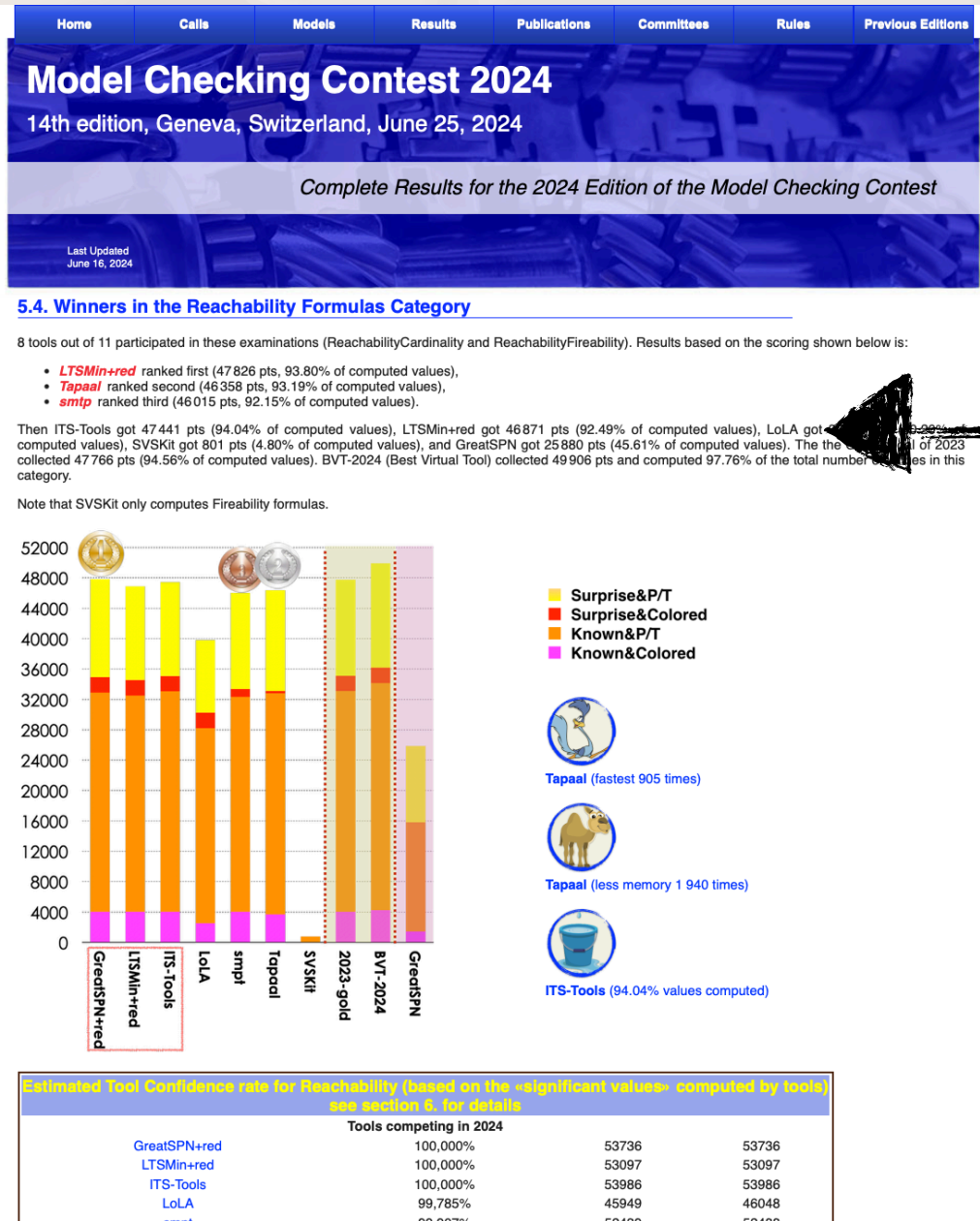
Tools competing in 2024	Confidence rate	Points	Values
GreatSPN+red	100,000%	53736	53736
LTSMin+red	100,000%	53097	53097
ITS-Tools	100,000%	53986	53986
LoLA	99,785%	45849	46048

MCC in a nutshell

Every year since 2011
2025 is the 15th edition



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



What is performed by tools

Answering 6 classes of problems...

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

... on 142 models with a total of 1855 instances

24 115 queries (1 to 16 values to be returned per query)

5 surprise models in 2025

4

 **Champagne** (21 instances P/T)

 Frédéric Lang & Quentin Nivon

 **CopsAndRobbers** (12 instances P/T)

 Silvano Dal Zilio

 **ErlangenMainframeV0** (20 instances P/T)

 Hubert Garavel & Quentin Nivon

 **MedleyB** (13 instances P/T)

 Luca Di Stefano & Hubert Garavel

 **ZombiesAndSurvivors** (15 instances P/T)

 Silvano Dal Zilio

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 **ZombiesAndSurvivors** (15 instances P/T)

 Silvano Dal Zilio

**81 new instances to be
processed by tools**

Participating tools in 2025

tool	PT	Col	who	place	Country
EnPaC	✓	✓	Z. Ding & Y. He & S. Li & C. Jiang	Tongji University	
ITS-Tools	✓	✓	Y. Thierry-Mieg	Sorbonne Université	
smpt	✓	✓	N. Amat	ONERA	
Tapaal	✓	✓	J. Srba	Aalborg University	
TINA.tedd	✓	✓	B. Berthomieu	LAAS-CNRS	
Gold-2024	✓	✓	F. Kordon (assembling)	ITS-Tools/GreatSPN+redTapaal/tedd	
BVT	✓	✓	F. Kordon (assembling)	artificial tool	—

Generic ratio surprise models / known models

-  Surprise models score should weight approx 1/2 of known models
-  $\sim \times 13$ (exactly 12.89 but rounded to 13)

Reuse of «difficult formulas» of 2024 (sometimes 2023)

-  Difficulty = less than 3 tools could cope with it in 2024
 - ▶ check if tools could cope with these formulas
 - ▶ check if this increased the overall difficulty

A new set of formulas

-  207 760 formulas (UpperBound, reachability, CTL, LTL)
 - ▶ including the some reused from 2023 and 2024 (specifically tagged)

Execution in 2025

7

Use of two clusters @ Sorbonne Université

Involved Machines and Execution of the Benchmarks

	tall	Small	Total
Physical Cores	15x32 @ 2.1GHz	23x12 @ 2.4GHz	—
Memory (GB)	15x384	23x64	—
Used Cores (sequential tools)	15x31, 12x31 VM in //	23x3, 9x3 VM in //	—
Used Cores (parallel tools)	15x28 (4 per VM), 11x7 VM in //	23x8 (4 per VM), 9x2 VM in //	—
Number of runs	94 380	50 310	144 690

warning

Due to a mistake in one submitted VM,
no memory and CPU information this year
(crashes our analysis tools + not relevant)

Execution in 2025

Use of two clusters @ Sorbonne Université

Involved Machines and Execution of the Benchmarks			
	tall	Small	Total
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Memory (GB)	15x384	23x64	—
Used Cores (sequential tools)	15x31, 12x31 VM in //	23x3, 2x3 VM in //	—
Used Cores (parallel tools)	Warning about results to come Due to lack of time, no computation rate for tools in 2025		—
Number of VMs	15x31	23x3	144 690

warning

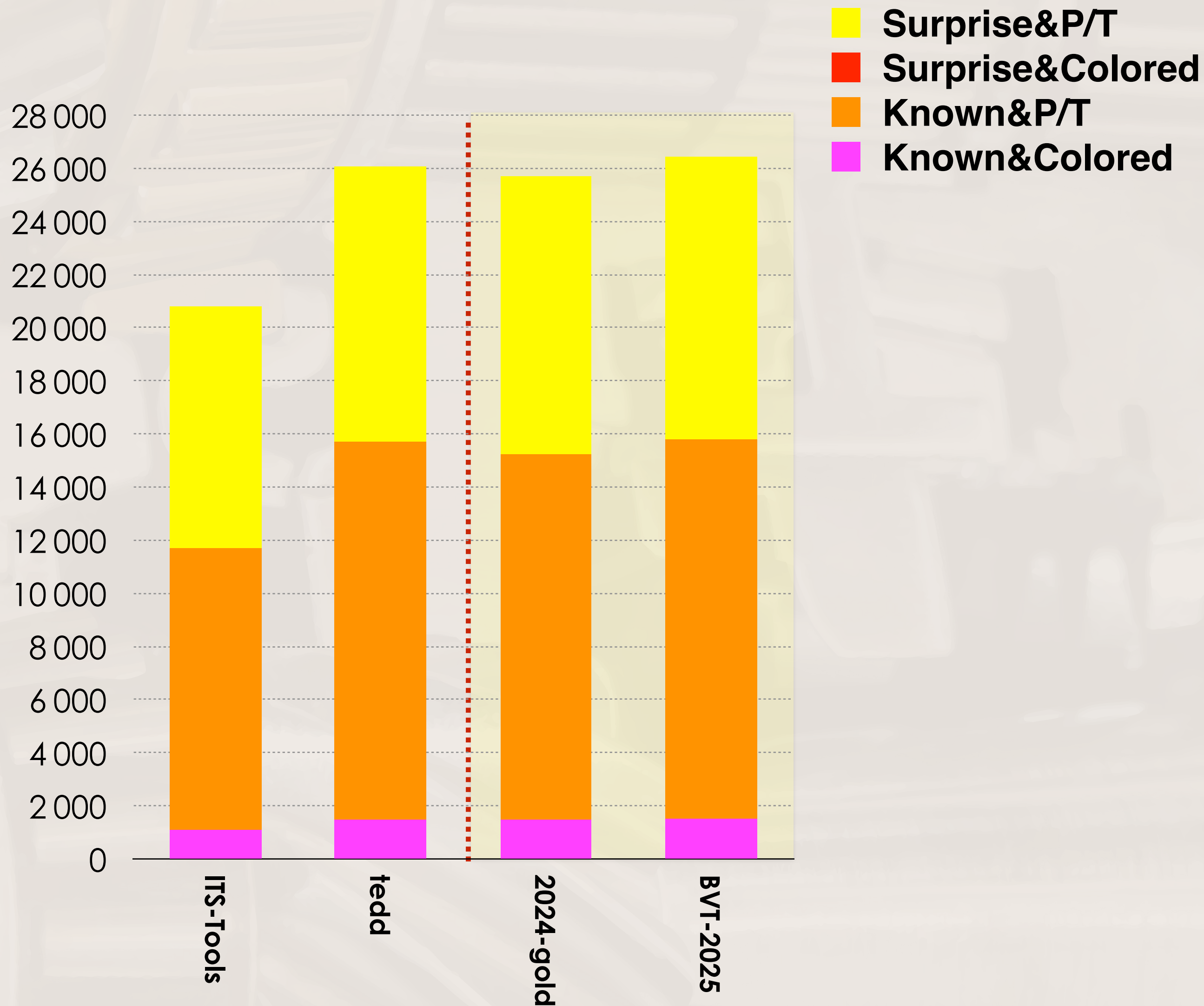
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StateSpace Examination

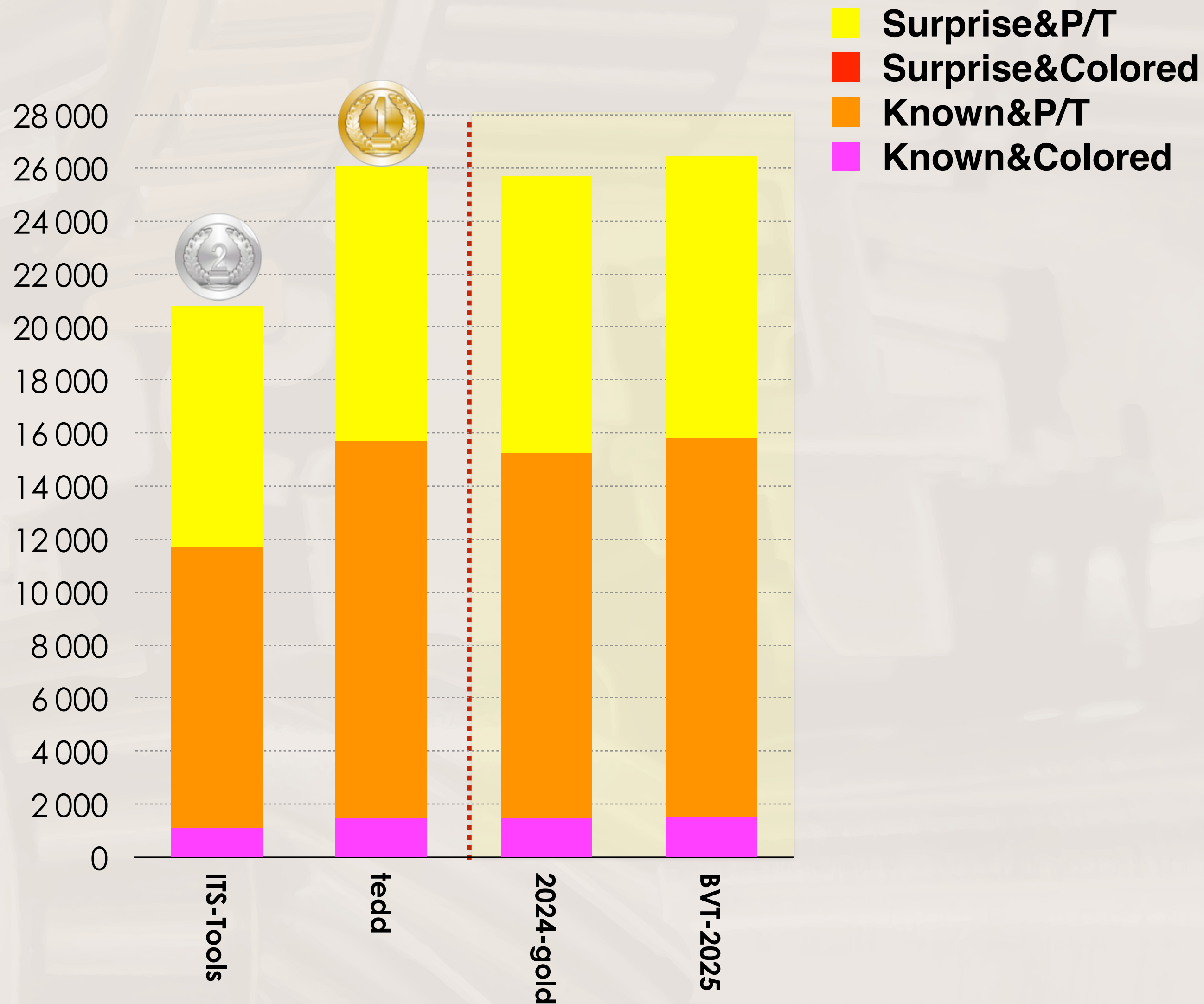


8

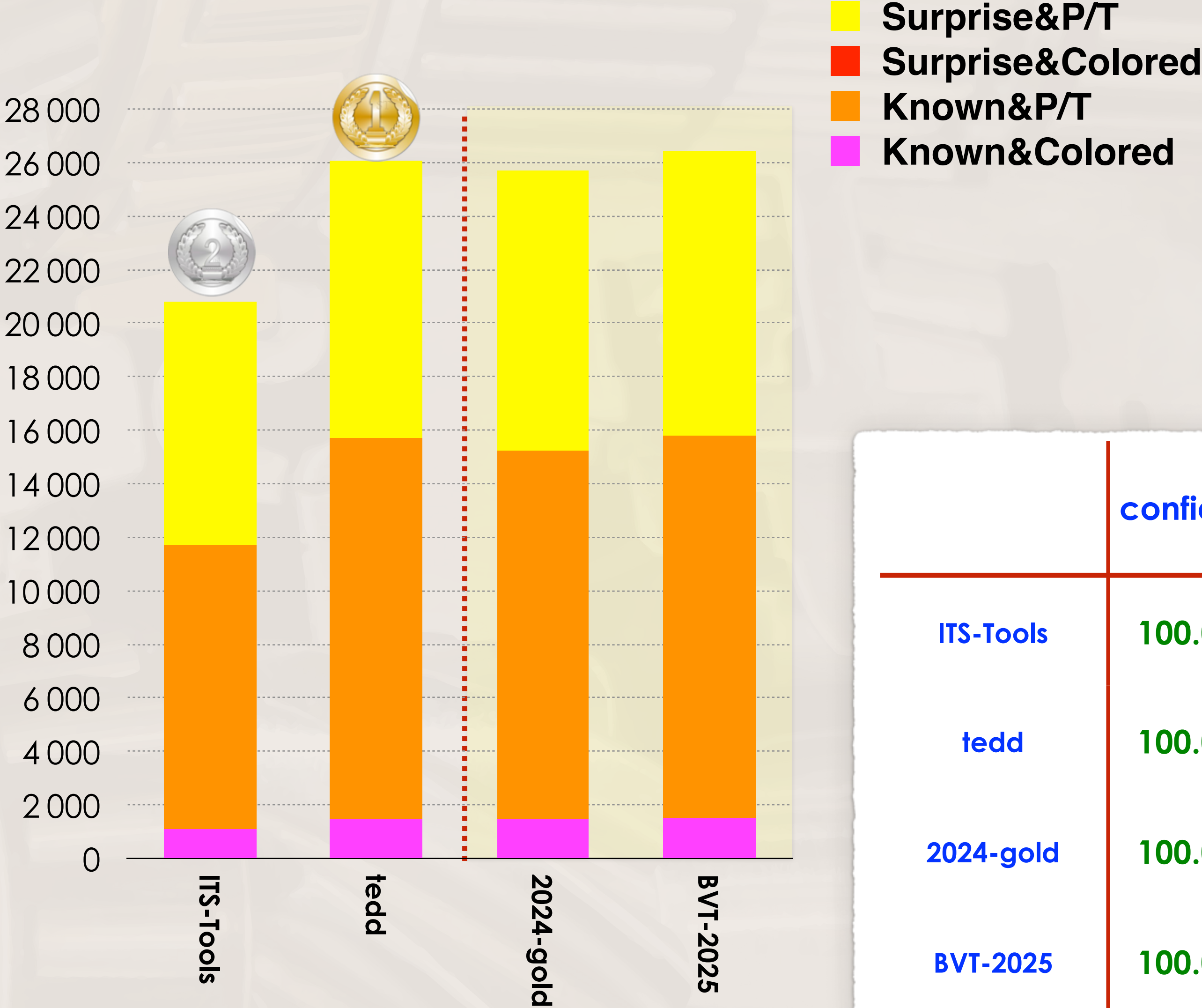
F. Kordon — Sorbonne Université — CC2025



StateSpace Examination

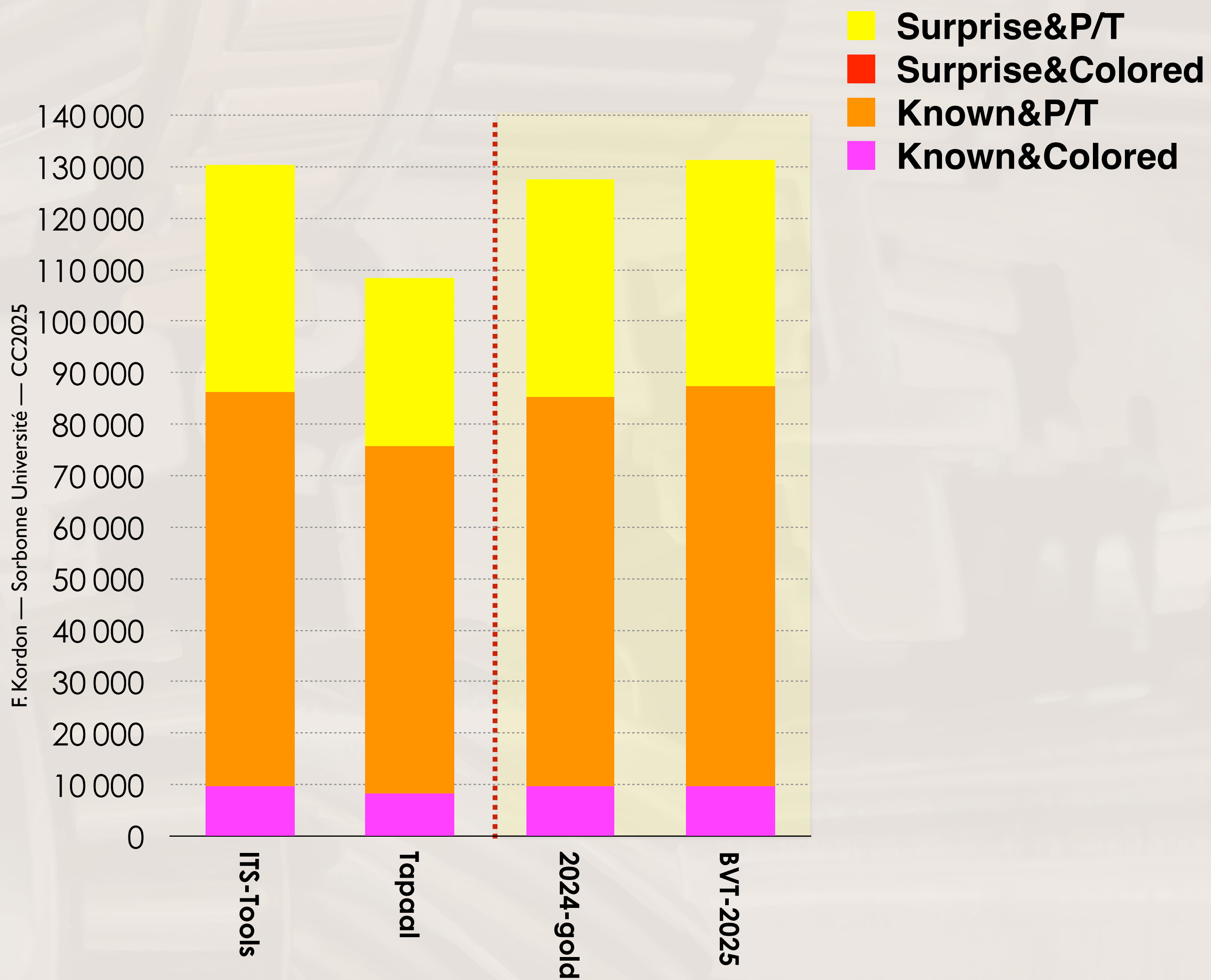


StateSpace Examination

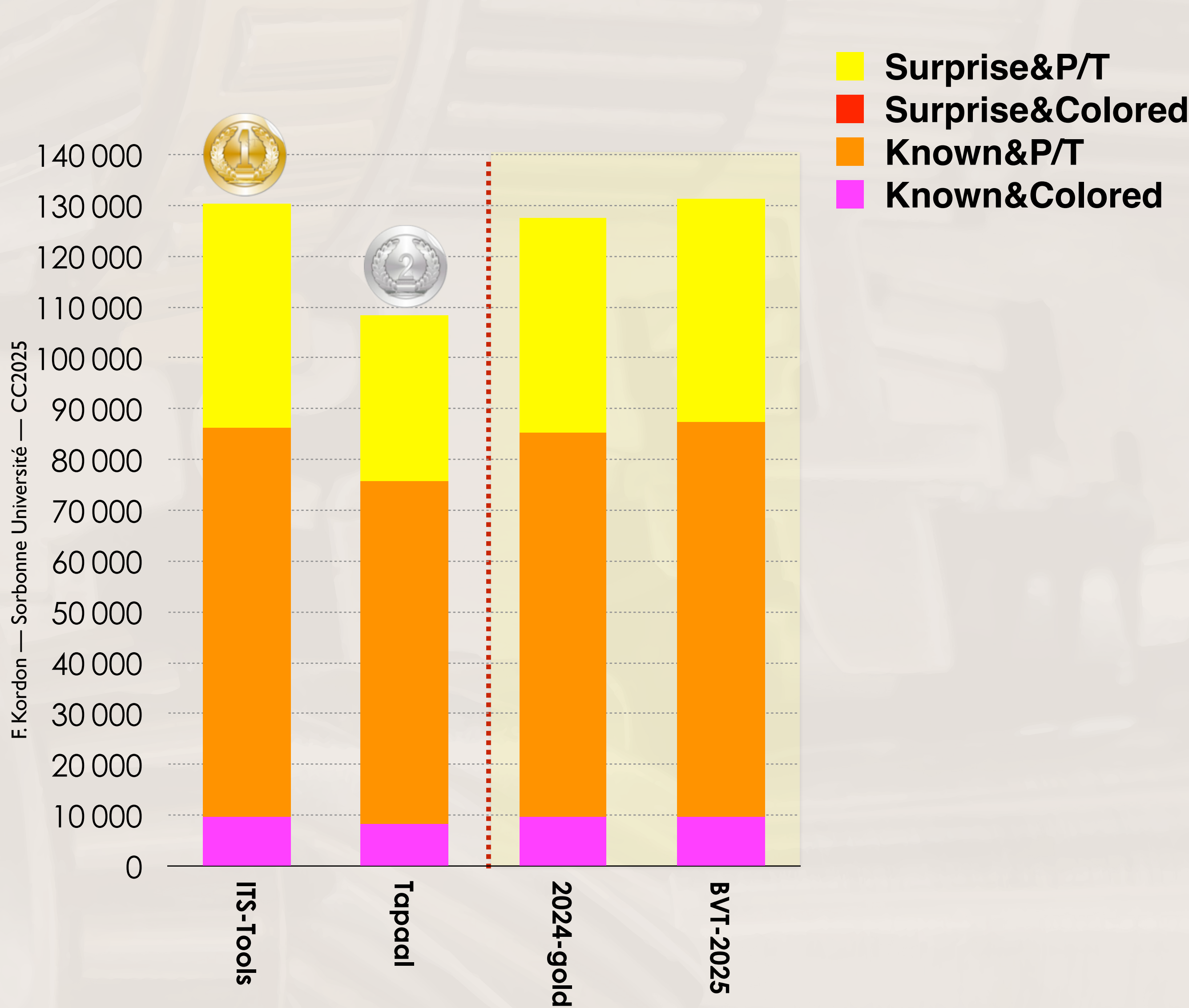


	confidence	success	computed
ITS-Tools	100.000%	3253	3253
tedd	100.000%	3253	3253
2024-gold	100.000%	3253	3253
BVT-2025	100.000%	3202	3202

Global Properties Examination



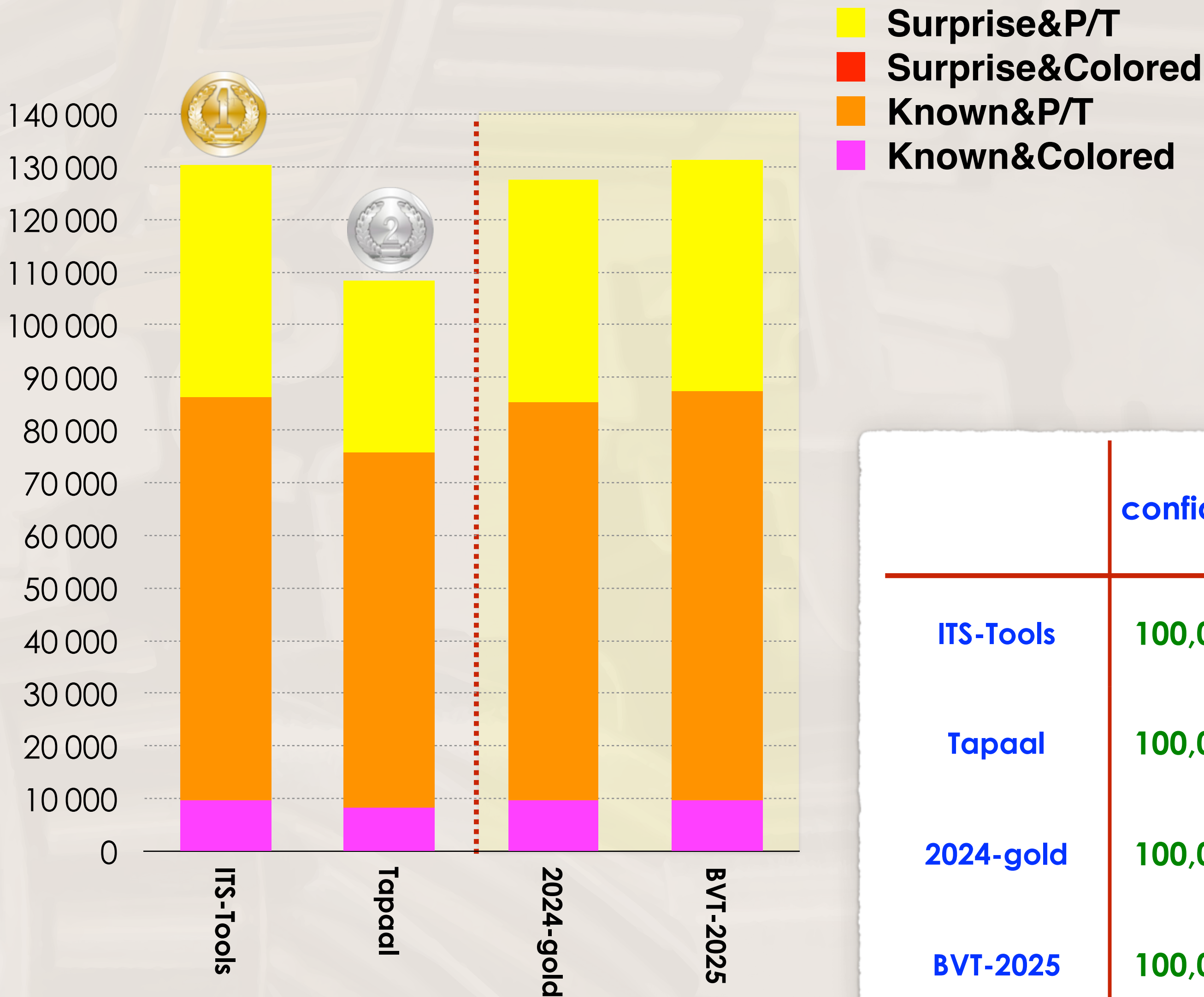
Global Properties Examination



Global Properties Examination

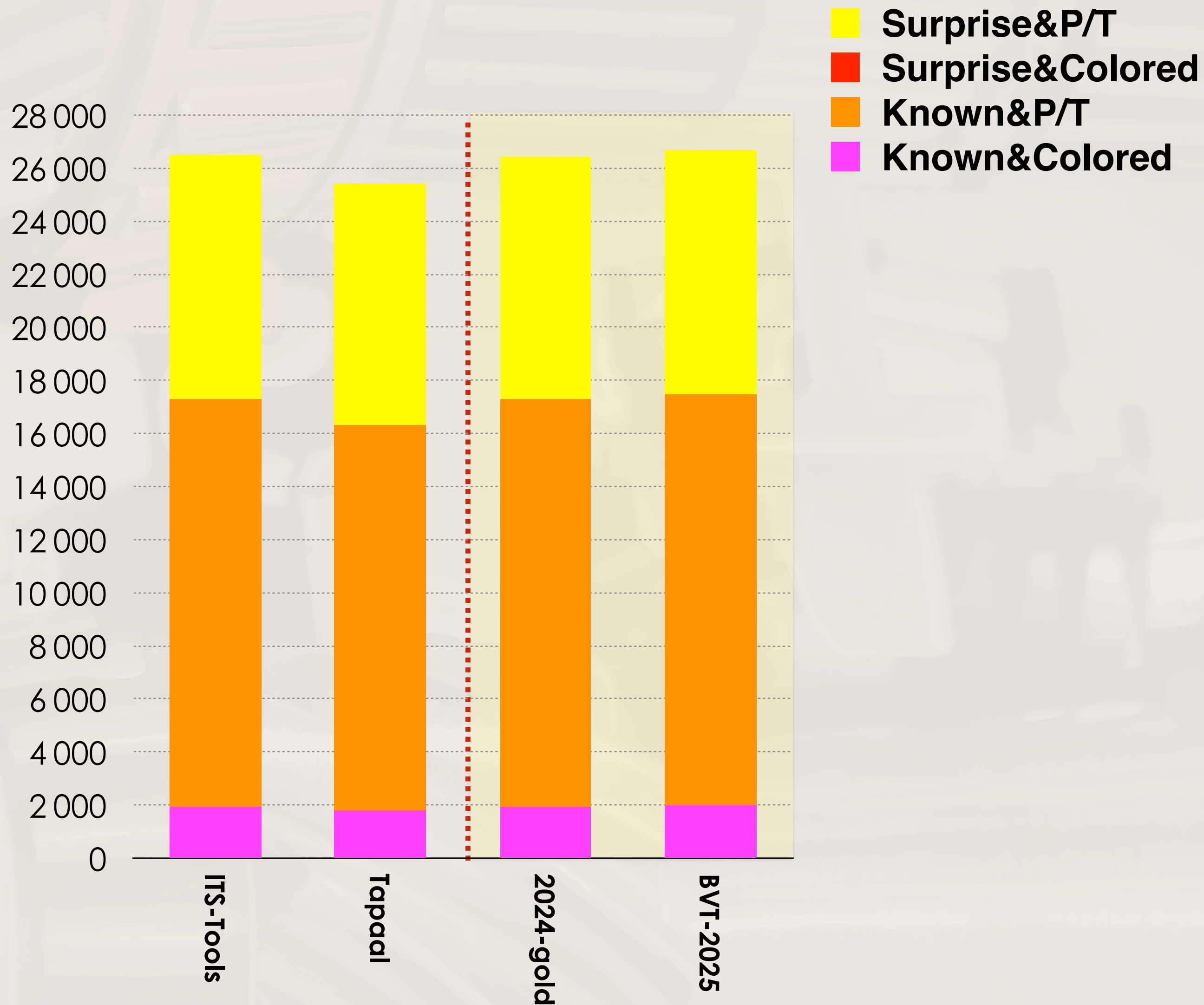


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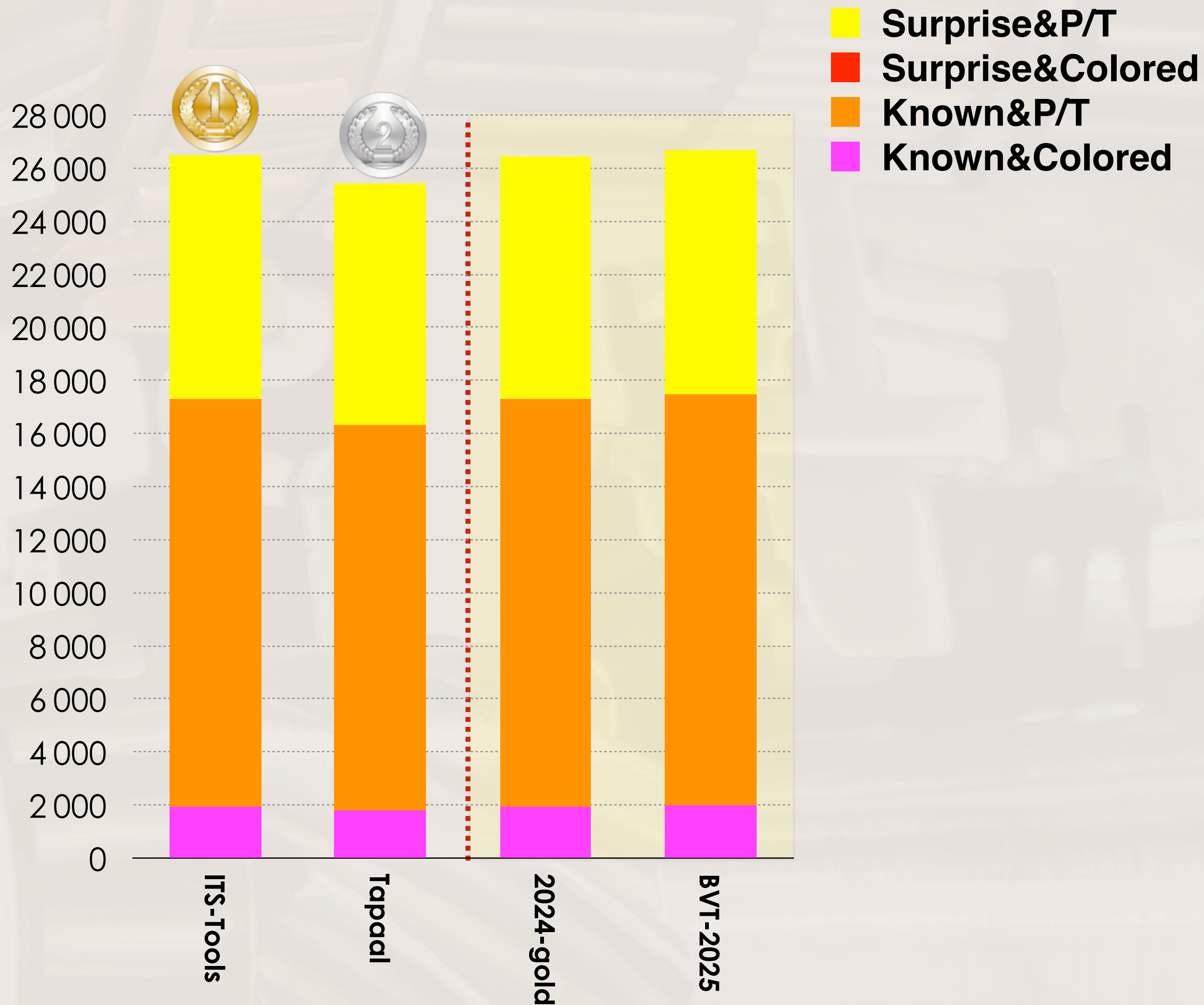


	confidence	success	computed
ITS-Tools	100,000 %	7564	7564
Tapaal	100,000 %	7564	7564
2024-gold	100,000 %	7564	7564
BVT-2025	100,000 %	7564	7564

UpperBounds Examination



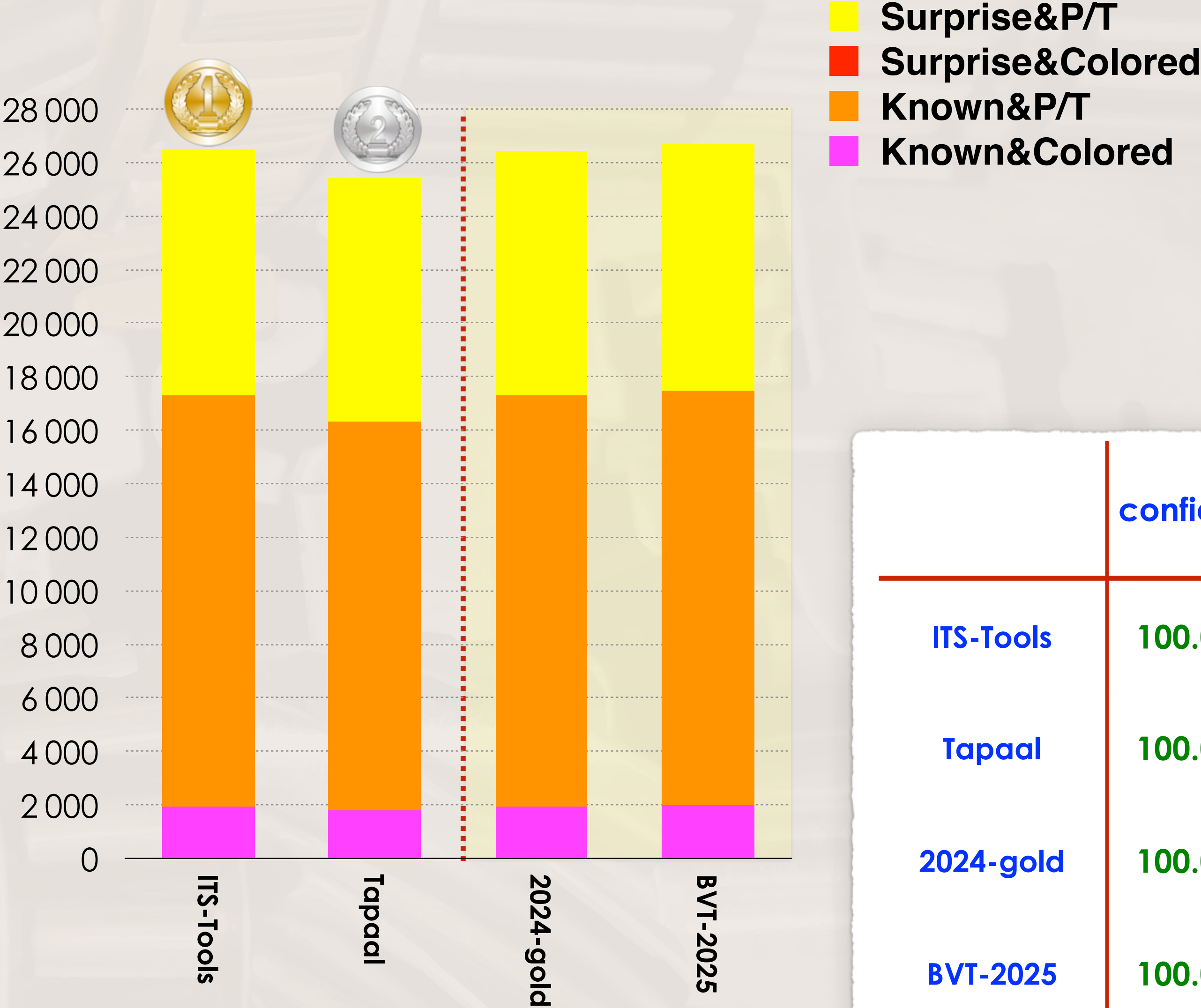
UpperBounds Examination



UpperBounds Examination

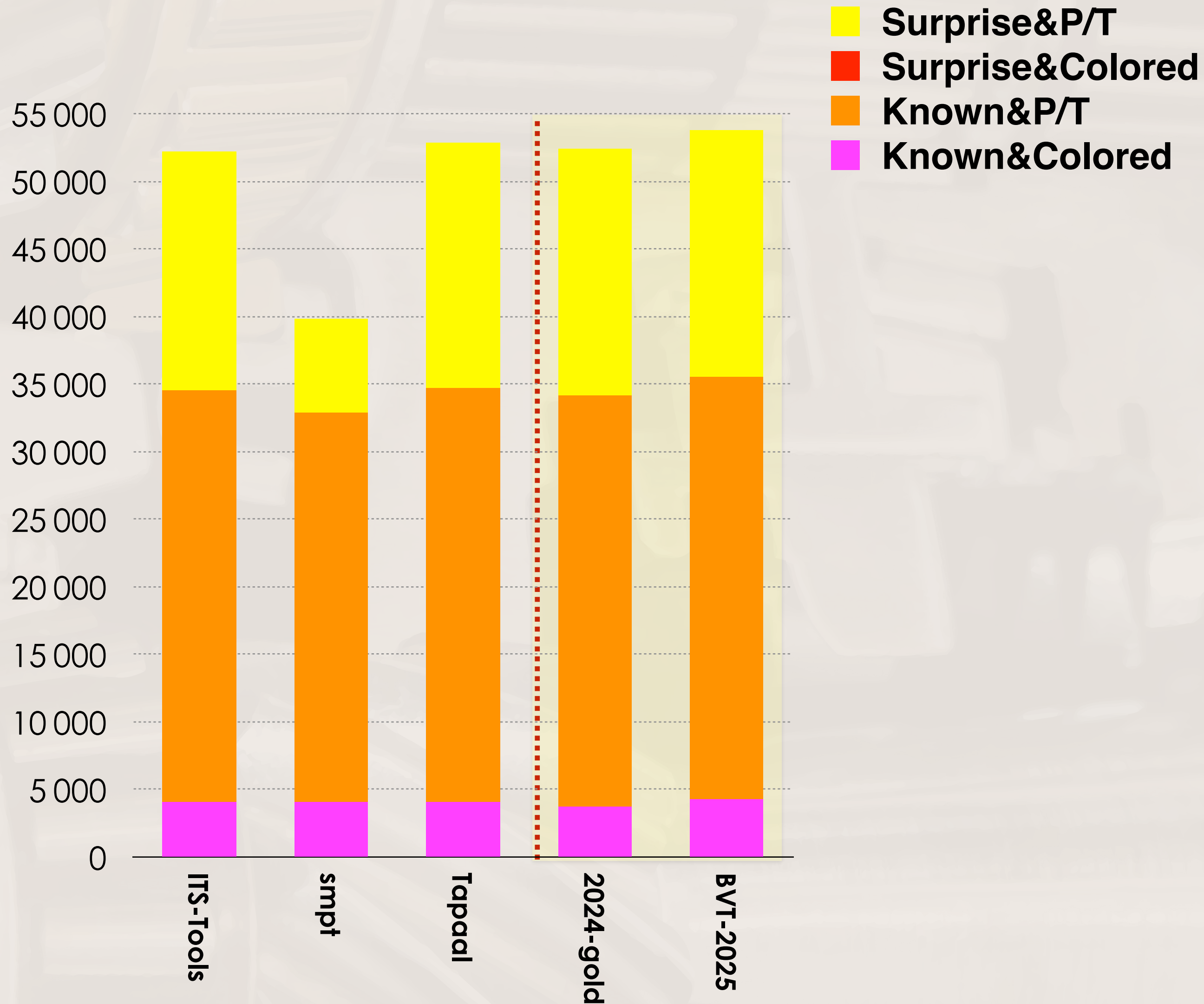


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	confidence	success	computed
ITS-Tools	100.000%	26567	26567
Tapaal	100.000%	26567	26567
2024-gold	100.000%	26567	26567
BVT-2025	100.000%	26567	26567

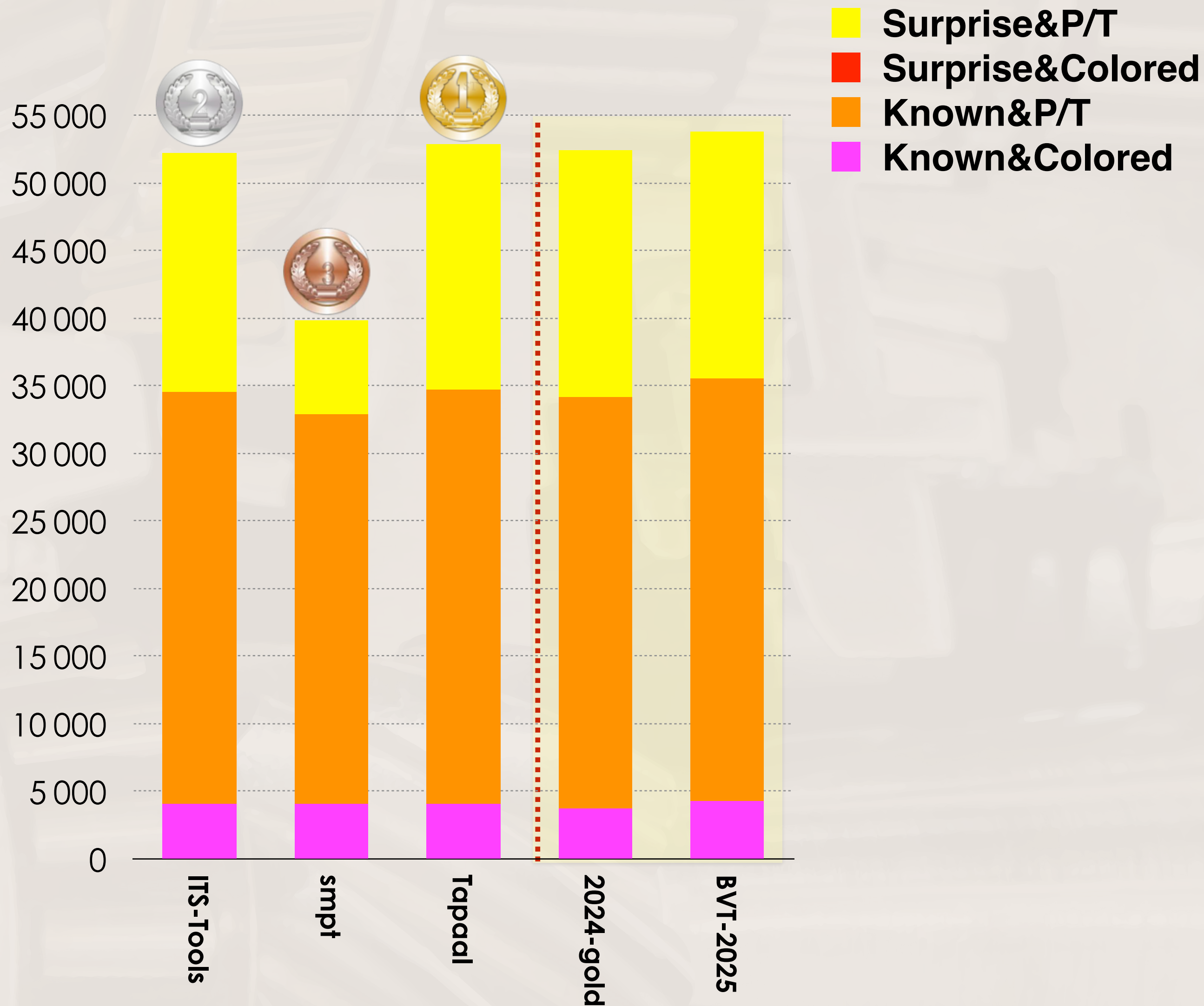
Reachability Examination



Reachability Examination



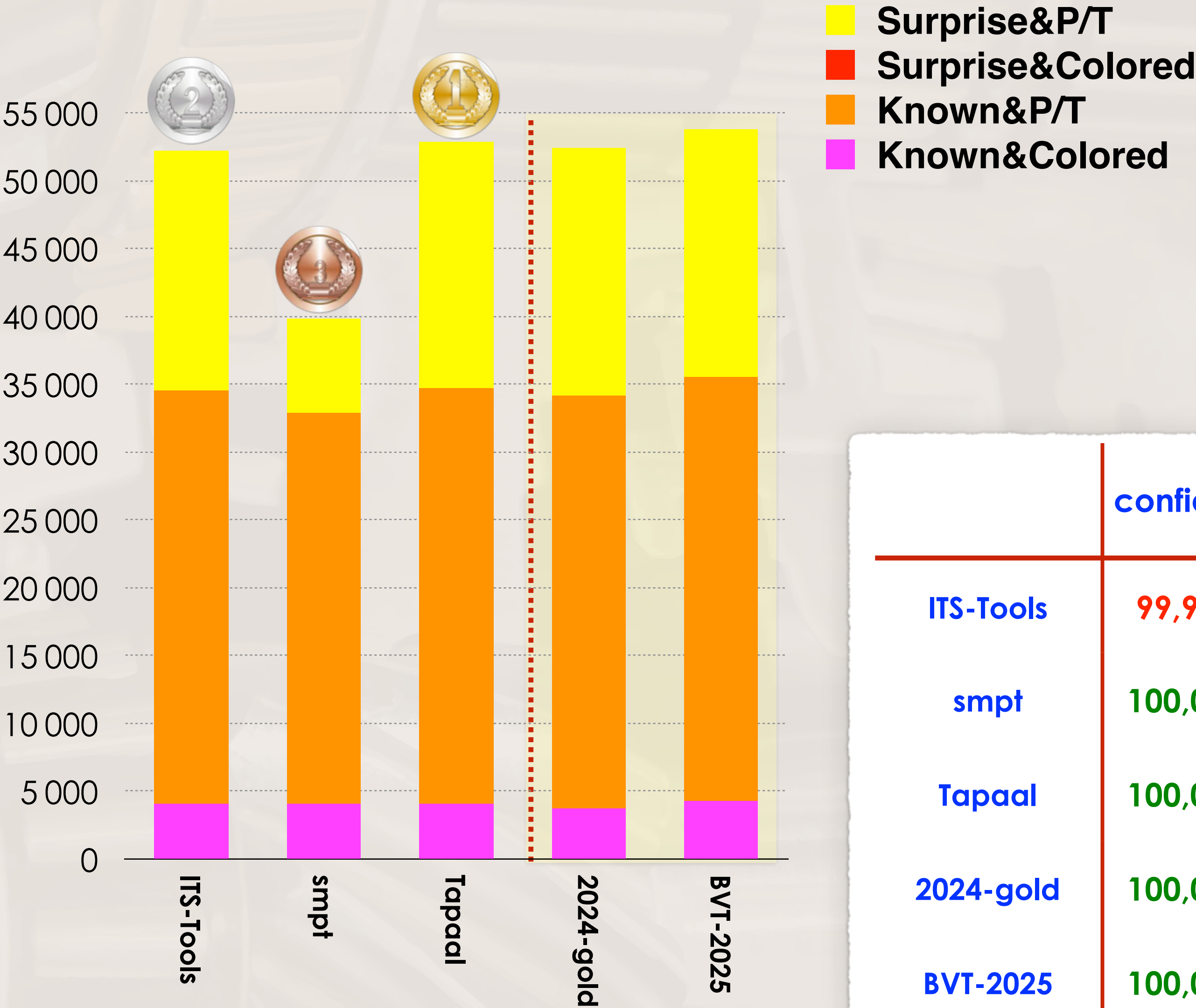
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Reachability Examination



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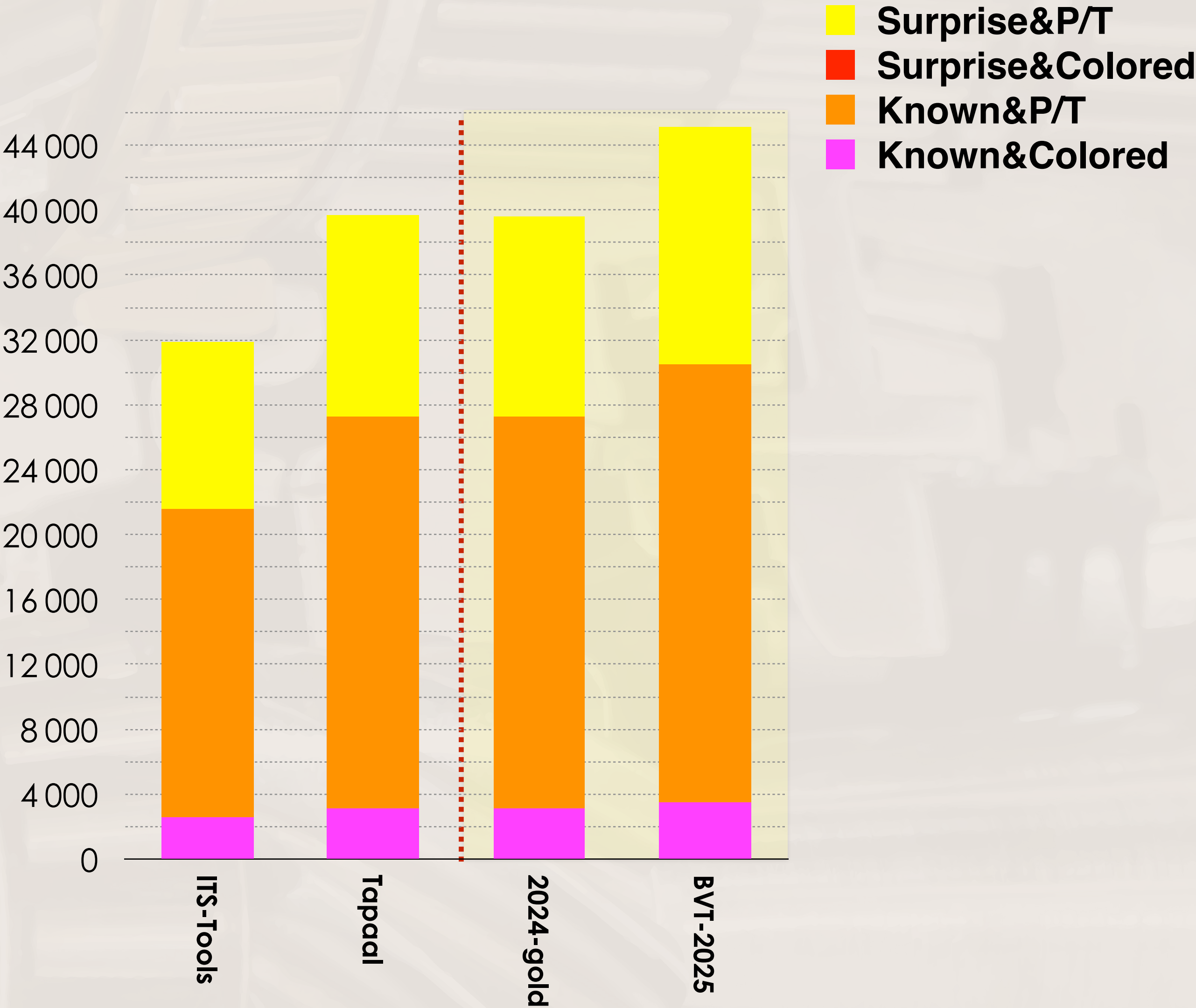


	confidence	success	computed
ITS-Tools	99,998 %	54760	54761
smpt	100,000 %	50860	50860
Tapaal	100,000 %	55241	55241
2024-gold	100,000 %	54898	54898
BVT-2025	100,000 %	55257	55257

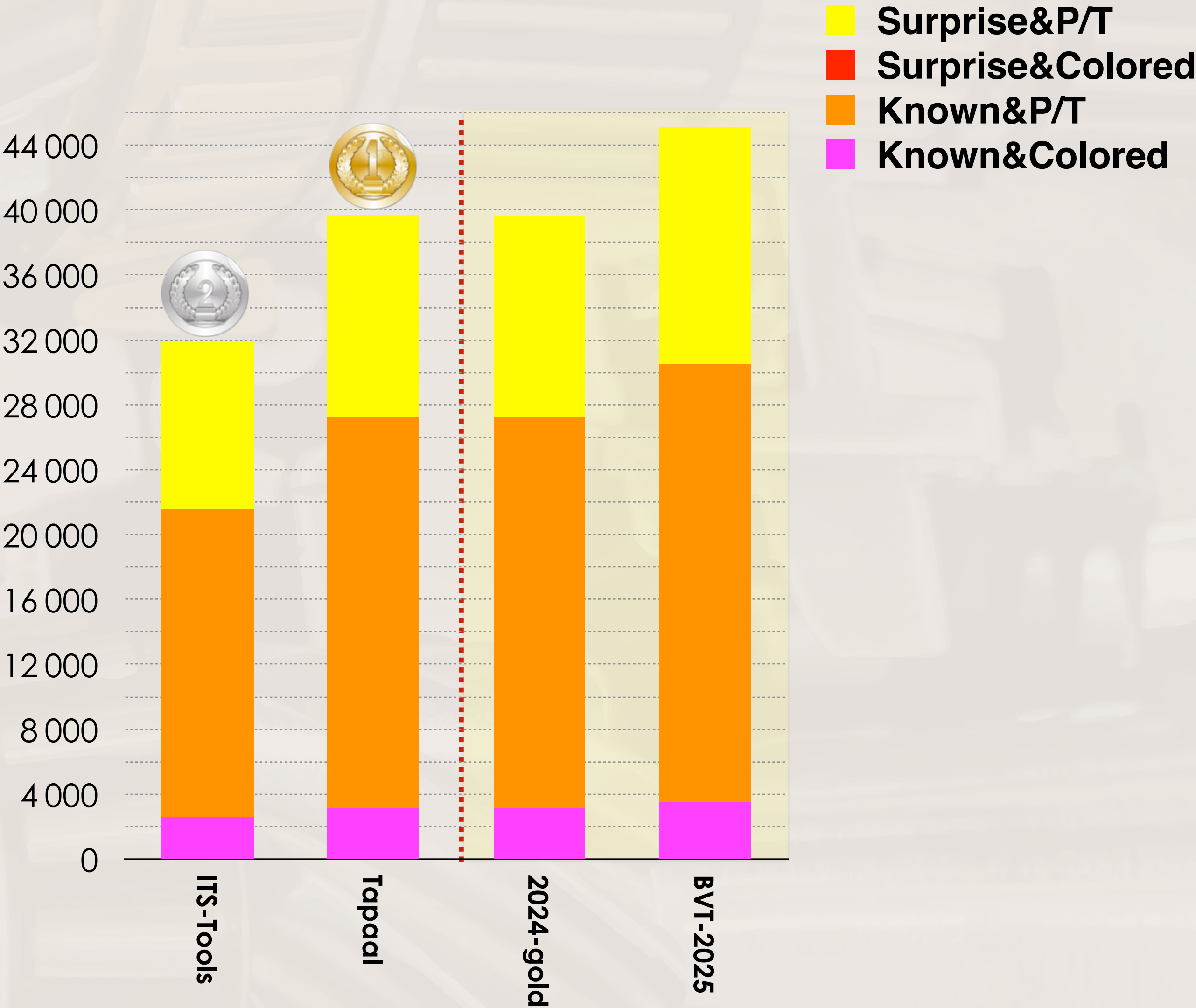
CTL Examination



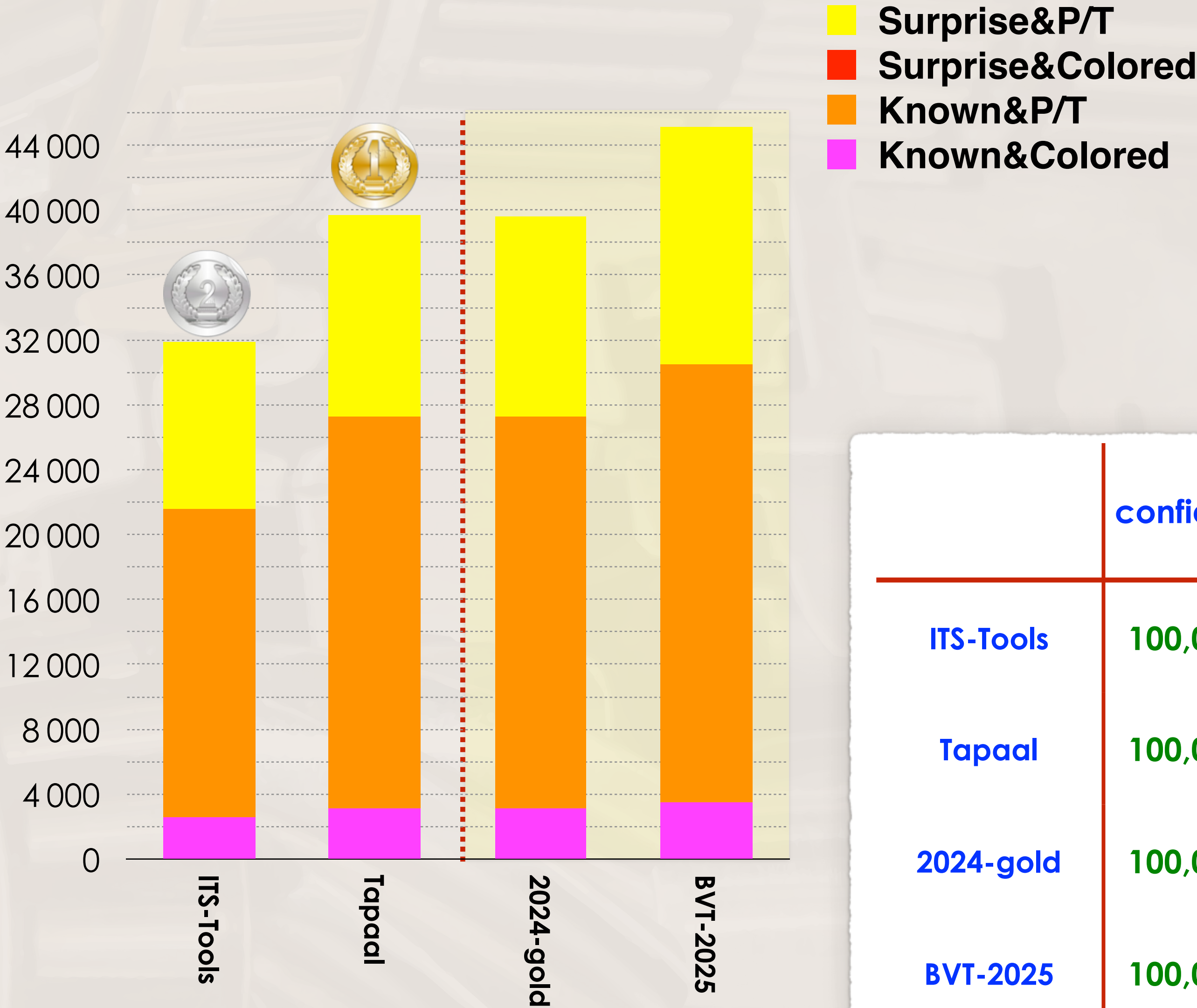
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CTL Examination

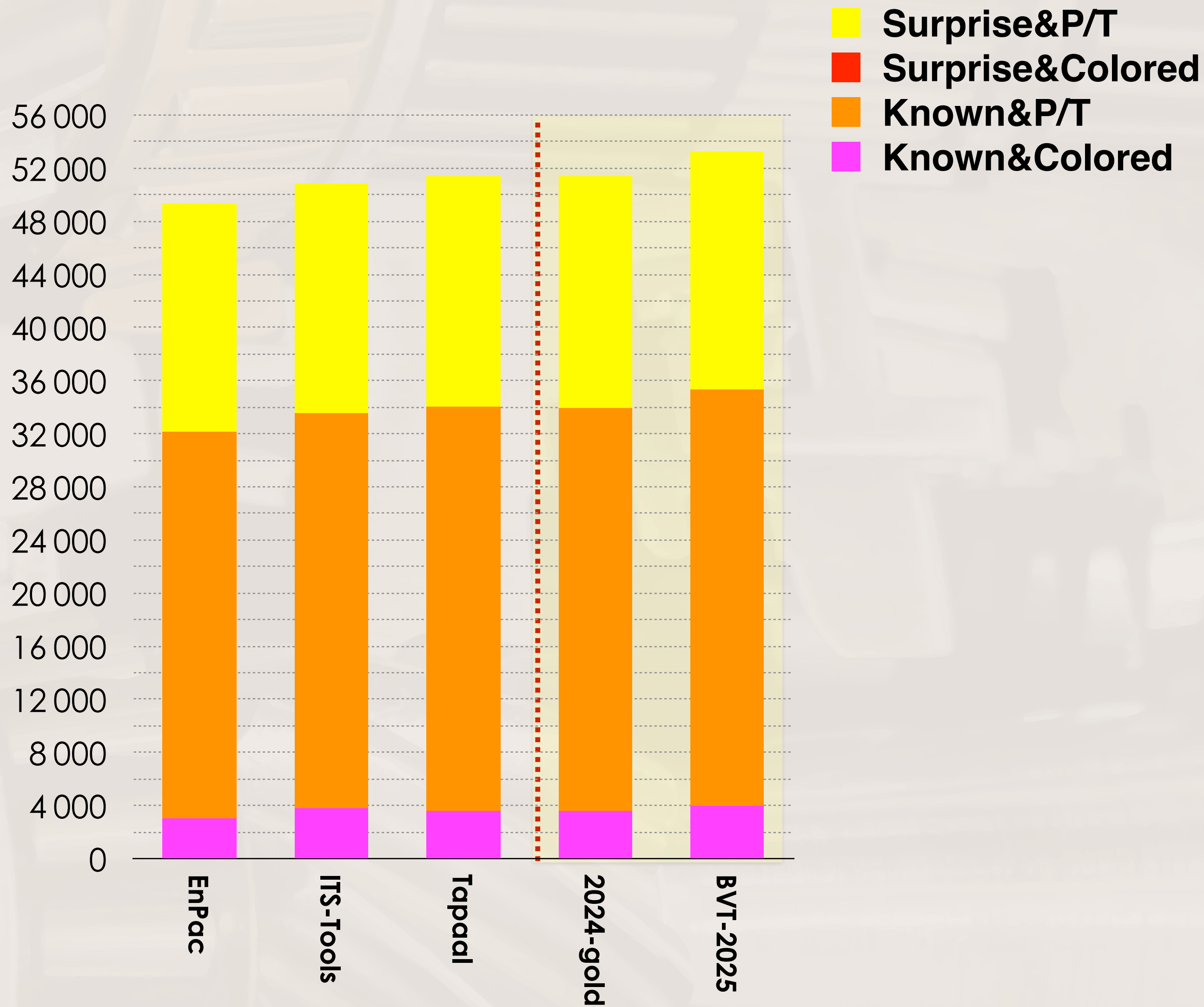


CTL Examination

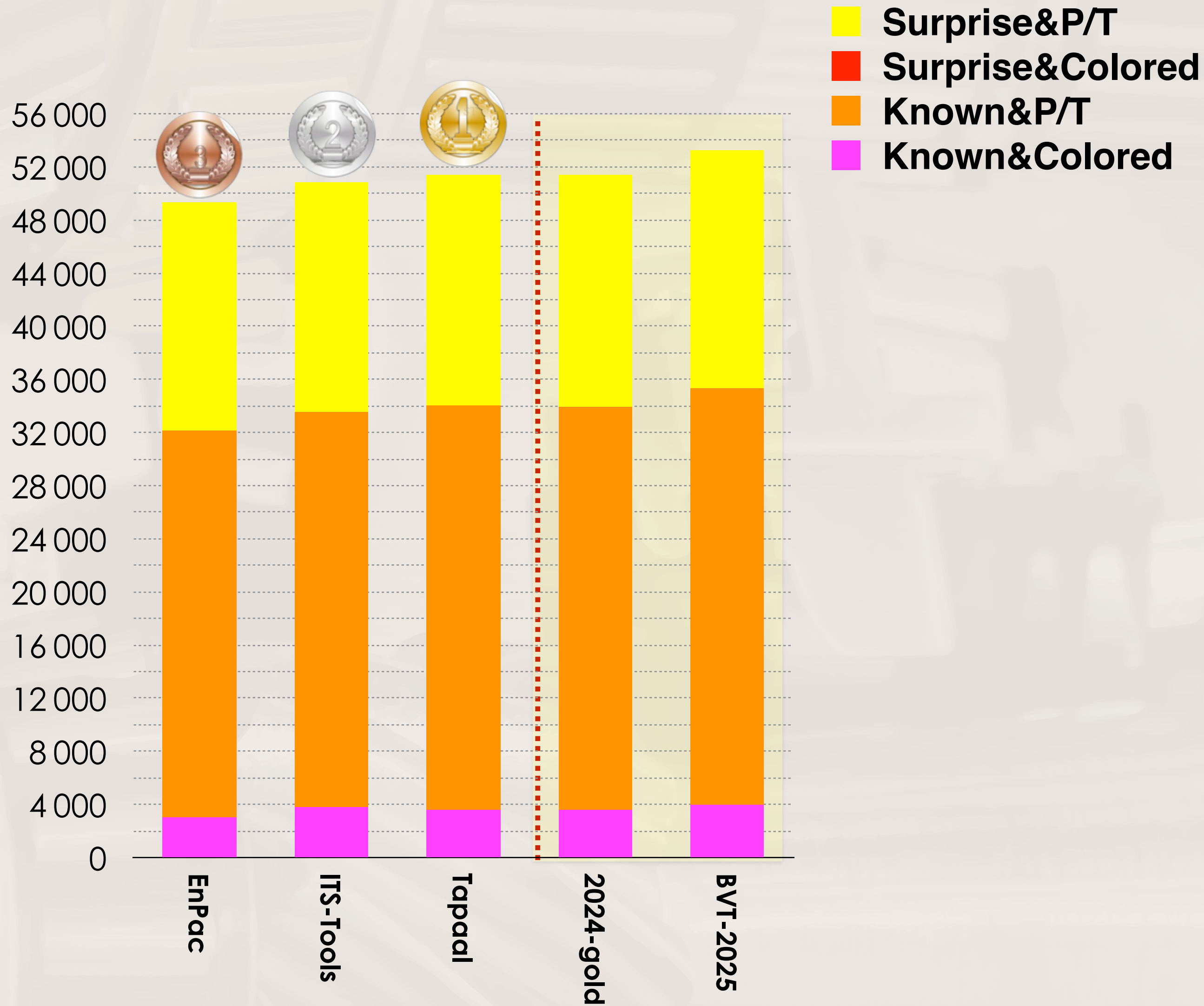


	confidence	success	computed
ITS-Tools	100,000 %	29026	29026
Tapaal	100,000 %	29026	29026
2024-gold	100,000 %	29026	29026
BVT-2025	100,000 %	29026	29026

LTL Examination



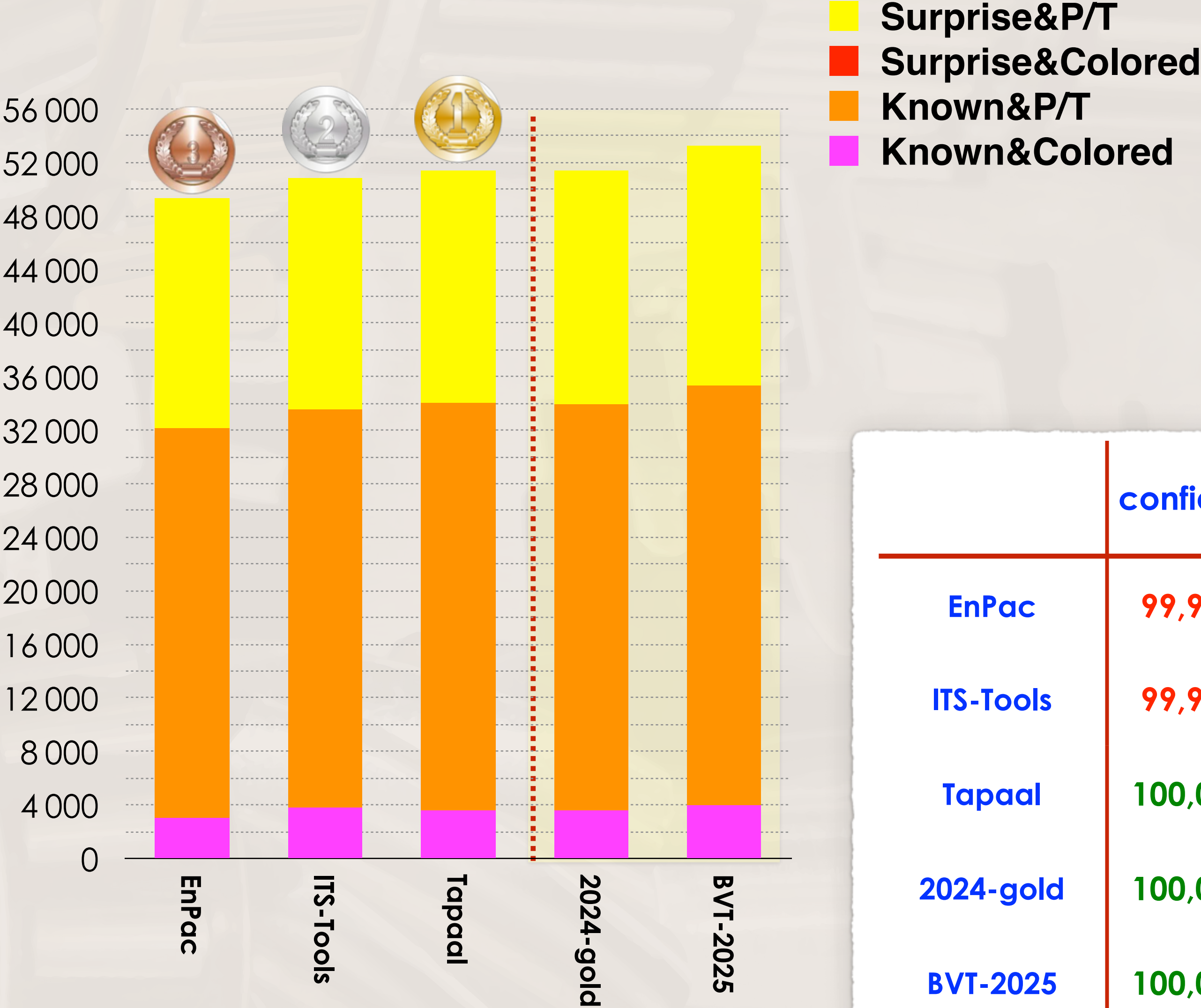
LTL Examination



LTL Examination



F. Kordon — Sorbonne Université — CC2025



	confidence	success	computed
EnPac	99,948 %	51733	51760
ITS-Tools	99,996 %	52392	52394
Tapaal	100,000 %	54198	54198
2024-gold	100,000 %	54195	54195
BVT-2025	100,000 %	54214	54214

Concluding remarks

Details soon available online

- <https://mcc.lip6.fr>
- Limited charts only in 2025 and limited outputs (lack of time)
 - Due to the trouble + lack of time from the organising team

The Results

They are displayed in the table below, together with scores (total, sum per category of model and sum per model).

Summary of Results for LTLCardinality					
	EnPac	ITS-Tools	Tapaal	2024-gold	BVT-2025
Total Points	22980.13	23863.59	24030.25	23982.13	24741.20
All «Surprise» models					
	EnPac	ITS-Tools	Tapaal	2024-gold	BVT-2025
Total Points	6732.59	6904.90	6874.80	6868.40	6981.70
fastest	17	19	12	25	1
less memory	0	73	0	0	1
Champagne — P/T (1535.50 pts max)					
	EnPac	ITS-Tools	Tapaal	2024-gold	BVT-2025
Score	1498.50	1535.09	1502.90	1502.90	1535.09
fastest	5	4	4	8	0
smallest memory	0	21	0	0	0
H04T0R	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---: / 73.09 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---:M / 73.09 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---:P- / 73.09 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---: / 73.09 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---: / 73.09 ➡
H04T1U	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---:P- / 73.09 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---:M / 73.09 ➡	?FFFFFFFFFFFFFFFF -TTTTTTTTTTTTTTT ---: / 68.50 ➡	?FFFFFFFFFFFFFFFF -TTTTTTTTTTTTTTT ---: / 68.50 ➡	FFFFFFFFFFFFFFFF TTTTTTTTTTTTTTTT ---: / 73.09 ➡
H04T2O	TFTTTTTTTTTFTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡	TFTTTTTTTTTFTTT TTTTTTTTTTTTTTTT ---:M / 73.09 ➡	TFTTTTTTTTTFTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡	TFTTTTTTTTTFTTT TTTTTTTTTTTTTTTT ---:P- / 73.09 ➡	TFTTTTTTTTTFTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡
H05T0R	TFFFFFFFFFTTTTT TTTTTTTTTTTTTTTT ---:P- / 73.09 ➡	TFFFFFFFFFTTTTT TTTTTTTTTTTTTTTT ---:M / 73.09 ➡	TFFFFFFFFFTTTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡	TFFFFFFFFFTTTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡	TFFFFFFFFFTTTTT TTTTTTTTTTTTTTTT ---: / 73.09 ➡
H05T1U	TFTTTTTFTTTTFFF TTTTTTTTTTTTTTTT ---	TFTTTTTFTTTTFFF TTTTTTTTTTTTTTTT ---	TFTTTTTFTTTTFFF TTTTTTTTTTTTTTTT ---	TFTTTTTFTTTTFFF TTTTTTTTTTTTTTTT ---	TFTTTTTFTTTTFFF TTTTTTTTTTTTTTTT ---

Concluding remarks

Details soon available online

- <https://mcc.lip6.fr>
- Limited charts only in 2025 and limited outputs (lack of time)
 - Due to the trouble + lack of time from the organising team

The Results

They are displayed in the table below, together with the results of the previous editions.

Summary of results		
	EnPac	ITS
Total Points	22980.13	22980.13

All «S» results		
	EnPac	ITS
Total Points	6732.59	6732.59
fastest	17	17
less memory	0	0

Champagne results		
	EnPac	ITS
Score	1498.50	1498.50
fastest	5	5
smallest memory	0	0

	EnPac	ITS
H04T0R	FFFFTFTFFFFFFFFFF FFFFTFT	FFFFTFT
	----- / 73.09	-----M
H04T1U	FTFFFFFFFFFFFTFTFT FTFFFFF	FTFFFFF
	-----P- / 73.09	-----M
H04T2O	TFTTFTFTFTFTFTFTT TFTTFTT	TFTTFTT
	----- / 73.09	-----M
H05T0R	TFTTFTFTFTFTFTFTT TFTTFTT	TFTTFTT
	-----P- / 73.09	-----M
H05T1U	TFTTFTFTFTFTFTFTT TFTTFTT	TFTTFTT
	----- / 73.09	-----M

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Behind the Scene of the Model Checking Contest, Analysis of Results from 2018 to 2023

Conference paper | First Online: 01 November 2024

pp 52–89 | Cite this conference paper

Nicolas Amat, Elvio Amparore, Bernard Berthomieu, Pierre Bouvier, Silvano Dal Zilio, Francis Hulin-
Hubard, Peter G. Jensen, Loig Jezequel, Fabrice Kordon, Shuo Li, Emmanuel Paviot-Adet, Laure
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Concluding remarks

Details

<https://mcc.lip6.fr/certificates/2025/<type>-<examination>-2025.png>
e.g. <https://mcc.lip6.fr/certificates/2025/gold-CTL-2025.png>

Due to t

Certificates also out

Three 100% certificates
[conf100-smpt-2025.png](#)
[conf100-Tapaal-2025.png](#)
[conf100-tedd-2025.png](#)

The Results

They are displayed

Summary of		
	EnPac	IT
Total Points	22980.13	2
All		
	EnPac	IT
Total Points	6732.59	6
fastest	17	
less memory	0	
Champagne		
	EnPac	ITS
Score	1498.50	15
fastest	5	
smallest memory	0	

H04T0R	FFFFFTFTFFFFFFFFFF FFFFFFT	TTTTTTTTTTTTTTTTTTTT	----	/ 73.09	----	M
H04T1U	FTFTFTFTFTFTFTFTFT FTFTFTFT	TTTTTTTTTTTTTTTTTTTT	----	P- / 73.09	----	M
H04T2O	TFTFTFTFTFTFTFTFT FTFTFTFT	TTTTTTTTTTTTTTTTTTTT	----	/ 73.09	----	M
H05T0R	TFTFTFTFTFTFTFTFT FTFTFTFT	TTTTTTTTTTTTTTTTTTTT	----	P- / 73.09	----	M
H05T1U	TFTFTFTFTFTFTFTFT FTFTFTFT	TTTTTTTTTTTTTTTTTTTT	----	/ 73.09	----	M

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The Model Checking Contest is in danger

15

At this stage, the next edition cannot be planned

-  Model board (Quentin Nivon with the Help of Hubert Garavel)
 - ▶ Quentin is in PhD (3rd year), may not be available next year
-  Formula board (Loïg Jézéquel & Emmanuel Paviot-Adet)
 - ▶ Loïg Jézéquel is at least 2 years in a detached position
 - ▶ Emmanuel is overloaded
-  Execution board (Francis Hulin-Hubard & Fabrice Kordon)
 - ▶ Totally overloaded by their respective responsibilities

The Model Checking Contest is in danger

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We reach the first «MCC crisis»

 Model board (Hubert Garavel)
Other competition survived this with new teams

▶ Quentin is in PhD (3rd year), may not be available next year

 Formula board (Loïc Jézéquel & Emmanuel Paviot-Adet)

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► Emmanuel is overloaded

Execution board (Francis Hulin-Hubard & Fabrice Kordon)

► Totally over

So far, discussions with Silvano Dal Zilio

Future head of the MCC

*(a) preserve and document the current process and protocol
(b) use this transition period to think about future evolutions*

Transition for 1, maybe 2 editions...

Only feasible if we have more forces

Time for discussion!

**Send us your benchmarks
and models !**

