

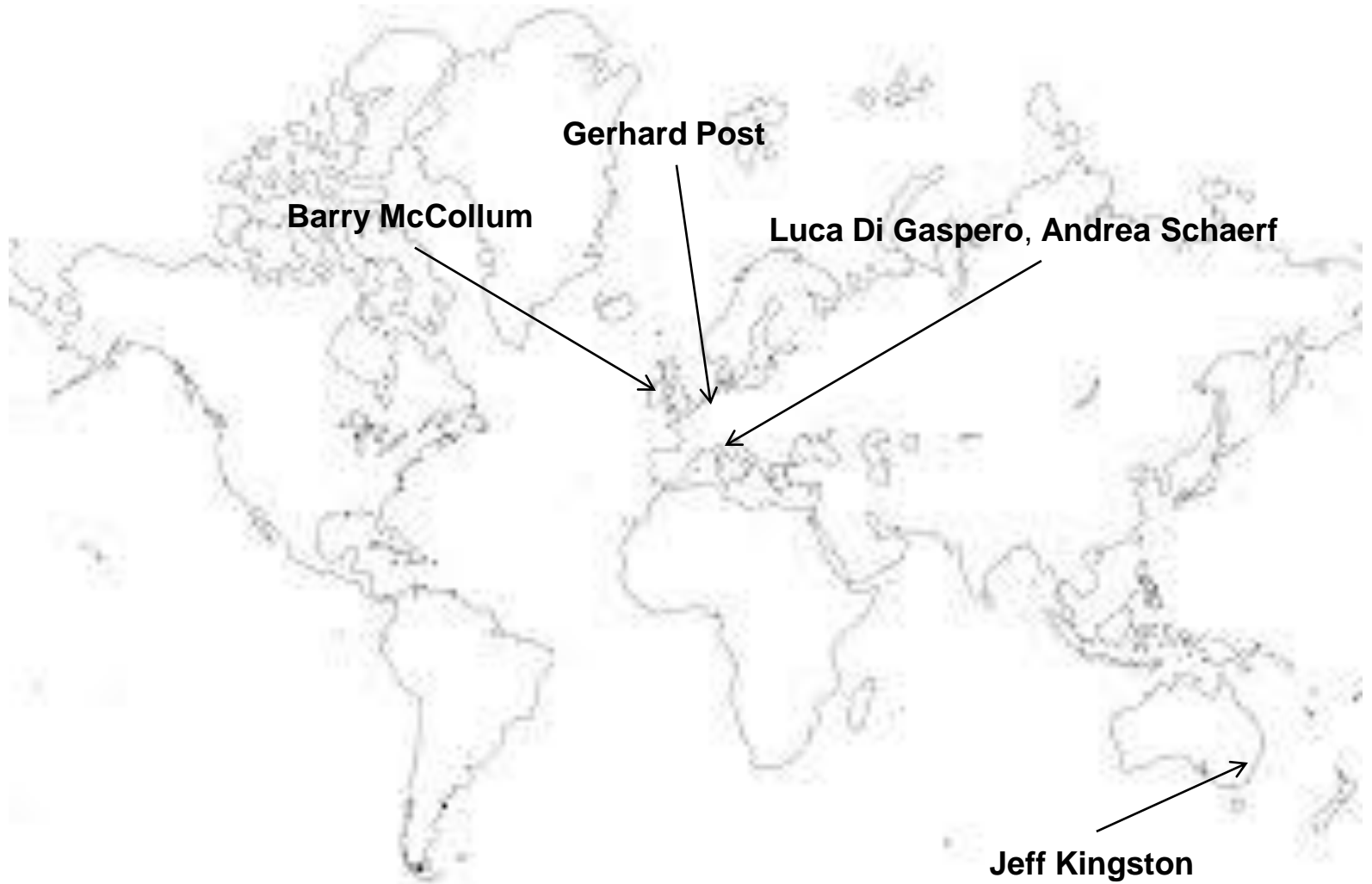
Results of the International Timetabling Competition 2011

- a competition of 3 independent rounds, devoted to high school timetabling -

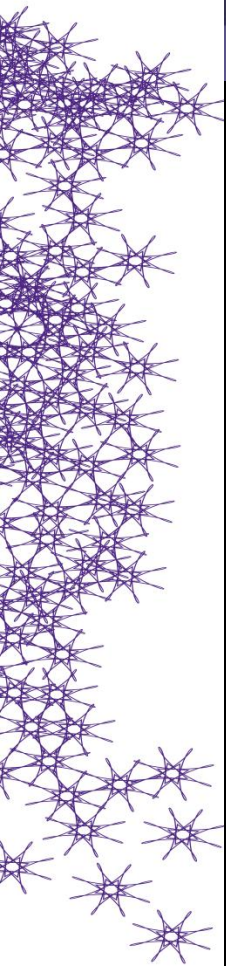
Supported by:



Organisers:



17 participants:



Participants

#	Project name	Country	Registration
1	Ying	China	October 11, 2011
2	HSU	Germany	October 13, 2011
3	Borburata	Venezuela	October 14, 2011
4	Bond	Canada	October 17, 2011
5	Optable	Brazil	November 1, 2011
6	Agata	Brazil	November 25, 2011
7	Aziz	Malaysia	January 7, 2012
8	HST	Poland	January 7, 2012
9	VAGOS	Greece	January 23, 2012
10	Join	India	February 2, 2012
11	Lectio	Denmark	February 12, 2012
12	Saman	Sri Lanka	February 19, 2012
13	DarwinEd	Chile	February 23, 2012
14	GOAL	Brazil	February 24, 2012
15	HySST	United Kingdom	March 6, 2012
16	HFT	Germany	April 18, 2012
17	Aspen	United States	April 20, 2012

legend:

did not submit

did submit solutions

Effort participants

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legend:

unknown

< 10 days

10 – 50 days

50 – 100 days

> 100 days

submitted

Round 1

- **Public** archive of instances (XHSTT-2012).
- Best contributed solutions are public as well.
- Participants can use **unlimited time and resources**.
- Submit best solution (**per instance**).
- CTIT prize: € 25 per instance for best in the end.



Round 1: 21 instances (XHSTT2012)

Instance	Country	Times	Teachers	Rooms	Classes	Students	Duration
BGHS98	Australia	40	56	45	30		1564
SAHS96	Australia	60	43	36	20		1876
TES99	Australia	30	37	26	13		806
Instance1	Brazil	25	8		3		75
Instance4	Brazil	25	23		12		300
Instance5	Brazil	25	31		13		325
Instance6	Brazil	25	30		14		350
Instance7	Brazil	25	33		20		500
StPaul	England	27	68	67	67		1227
ArtificialSchool	Finland	20	22	12	13		200
College	Finland	40	46	34	31		854
HighSchool	Finland	35	18	13	10		297
SecondarySchool	Finland	35	25	25	14		306
HighSchool1	Greece	35	29		66		372
Patras 3rd HS 2010	Greece	35	29		84		340
Preveza 3rd HS 2008	Greece	35	29		68		340
Instance1	Italy	36	13		3		133
GEPRO	Netherlands	44	132	80	44	846	2675
Kottenpark2003	Netherlands	38	75	41	18	453	1203
Kottenpark2005	Netherlands	37	78	42	26	498	1272
Lewitt2009	South Africa	148	19	2	16		838

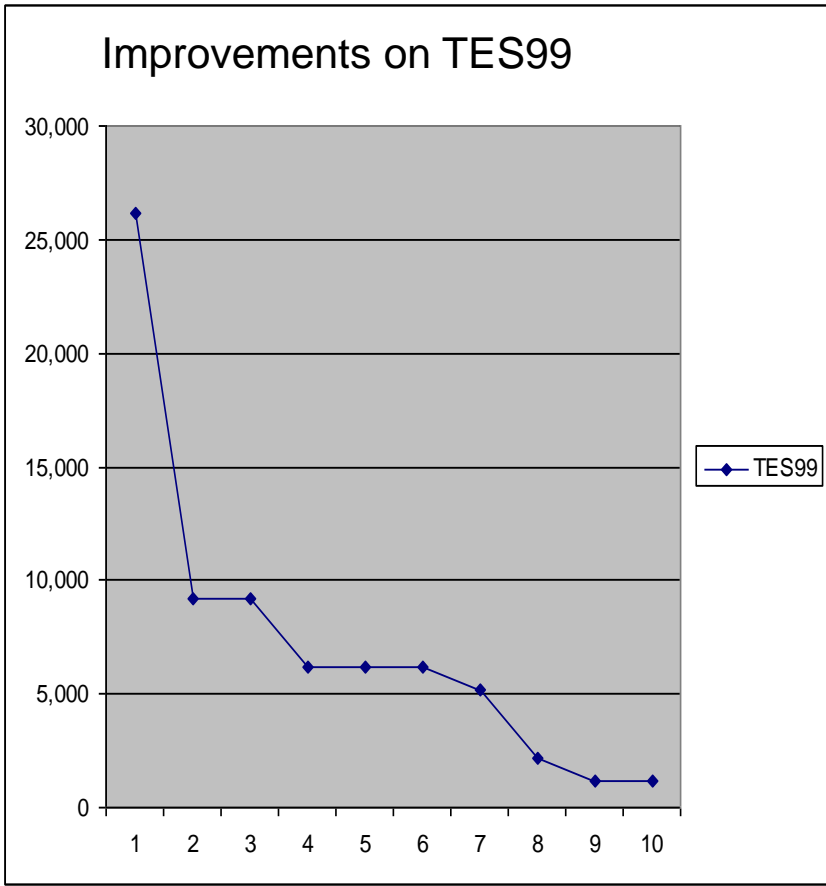
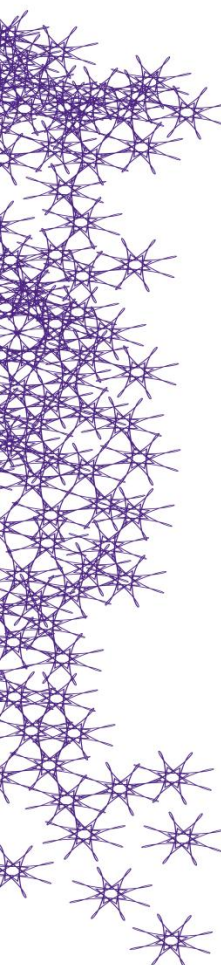
Round 1: instances + solutions

Dataset	Country	Best public
BGHS98	Australia	(7,433)
SAHS96	Australia	(23,044)
TES99	Australia	(26,134)
Instance1	Brazil	24
Instance4	Brazil	112
Instance5	Brazil	225
Instance6	Brazil	209
Instance7	Brazil	330
StPaul	England	18444
ArtificialSchool	Finland	0 (optimal)
College	Finland	0 (optimal)
HighSchool	Finland	1
SecondarySchool	Finland	106
HighSchool1	Greece	0 (optimal)
Patras 3rd HS 2010	Greece	0 (optimal)
Preveza 3rd HS 2008	Greece	0 (optimal)
Instance1	Italy	28
GEPRO	Netherlands	(1,566)
Kottenpark2003	Netherlands	1410
Kottenpark2005	Netherlands	1078
Lewitt2009	South Africa	58

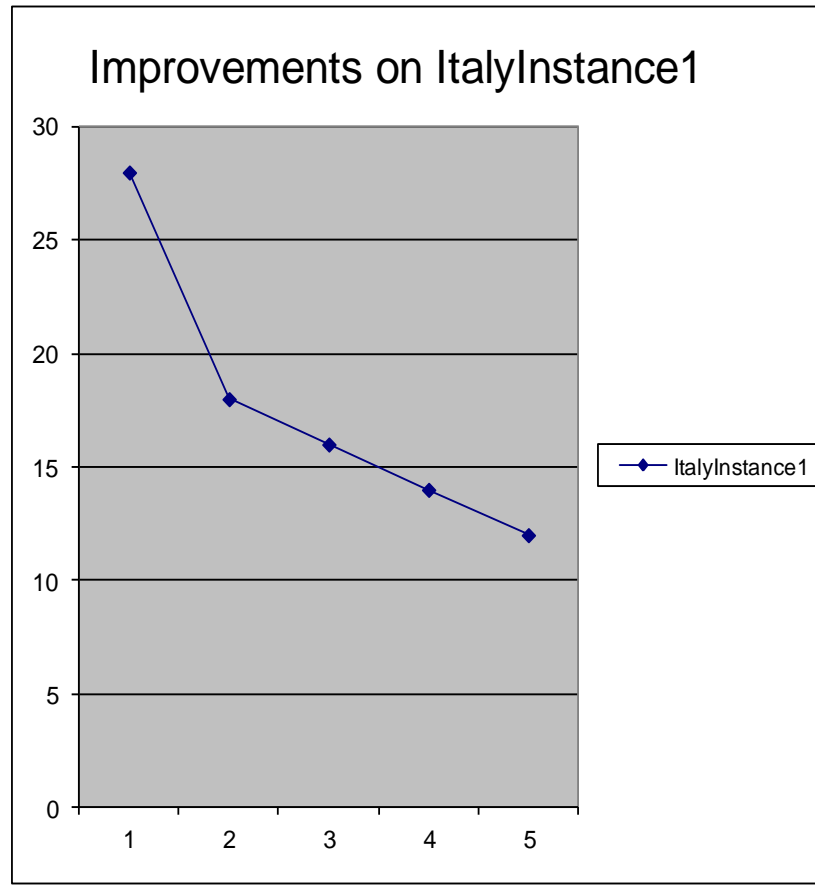
Round 1: results (infeasibility = 1000)

Dataset	Country	Best public	# contributions	Improvement
BGHS98	Australia	(7,433)	5	53 %
SAHS96	Australia	(23,044)	9	65 %
TES99	Australia	(26,134)	9	95 %
Instance1	Brazil	24	3	54 %
Instance4	Brazil	112	5	61 %
Instance5	Brazil	225	4	81 %
Instance6	Brazil	209	4	63 %
Instance7	Brazil	330	4	63 %
StPaul	England	18444	6	99 %
ArtificialSchool	Finland	0 (opt)	-	-
College	Finland	0 (opt)	-	-
HighSchool	Finland	1	1	
SecondarySchool	Finland	106	5	17 %
HighSchool1	Greece	0 (opt)	-	-
Patras 3rd HS 2010	Greece	0 (opt)	-	-
Preveza 3rd HS 2008	Greece	0 (opt)	-	-
Instance1	Italy	28	4	57 % (optimal)
GEPRO	Netherlands	(1,566)	2	12 %
Kottenpark2003	Netherlands	1410	7	62 %
Kottenpark2005	Netherlands	1078	7	51 %
Lewitt2009	South Africa	58	1	100 % (optimal)

Round 1: some results



Goal and HySST



Lectio and VAGOS

Round 1: winners

Dataset	HySST	VAGOS	Lectio	GOAL
BGHS98	(3, 494)			
SAHS96	(8, 052)			
TES99	(1, 140)			
BrazilInstance1		11		
BrazilInstance4		44		
BrazilInstance5		43		
BrazilInstance6		77		
BrazilInstance7		122		
StPaul			136	
FinlandSecondarySchool			88	
ItalyInstance1		12		
GEPRO				(1, 382)
Kottenpark2003			532	
Kottenpark2005			533	
Lewitt2009		0		

Round 2 (“traditional”)

- **Hidden** archive of instances (XHSTT-ITC2011-hidden).
- Instances “similar” to round 1.
- Solvers get **1000 seconds** per instance on default machine.
- Only freely available external programs are allowed.
- **Archive ranking** by average rank score.
- PATAT prize: £ 500 + 1 refund of fee for PATAT 2012.



Round 2: 18 instances

Instance	Country	Times	Teachers	Rooms	Classes	Students	duration
Instance2	Brazil	25	14		6		150
Instance3	Brazil	25	16		8		200
* Instance4 *	Brazil	25	23		12		300
* Instance6 *	Brazil	25	30		14		350
ElementarySchool	Finland	35	22	21	60		445
SecondarySchool2	Finland	40	22	21	36		566
Aigio 1st HS 2010	Greece	35	37		208		532
Instance4	Italy	36	61		38		1101
Instance1	Kosovo	62	101		63		1912
* Kottenpark2003 *	Netherlands	38	75	41	18	453	1203
Kottenpark2005A	Netherlands	37	78	42	26	498	1272
Kottenpark2008	Netherlands	40	81	11	34		1118
Kottenpark2009	Netherlands	38	93	53	48		1301
Woodlands2009	South Africa	42	40		30		1353
School	Spain	35	66	4	21		439
WesternGreeceUni3	Greece	35	19		6		210
WesternGreeceUni4	Greece	35	19		12		262
WesternGreeceUni5	Greece	35	18		6		184

Round 2: results ...

- Each solver was executed 10 times for 1000 seconds with 10 chosen randseeds.
- Per randseed the rank score is calculated (best = 1, second best = 2, etc.).
- Four teams (Goal, HFT, HySST, Lectio) participated.
- The table displays the average ranks for the first 6 instances.

Instance \ Team	Goal	HFT	HySST	Lectio
BrazilInstance2	EXCLUDED	3	2	1
BrazilInstance3	EXCLUDED	3	1	2
BrazilInstance4	EXCLUDED	3	1.9	1.1
BrazilInstance6	EXCLUDED	3	2	1
FinlandElementarySchool	1.9	4	2.95	1.15
FinlandSecondarySchool2	1	4	2.4	2.6
...

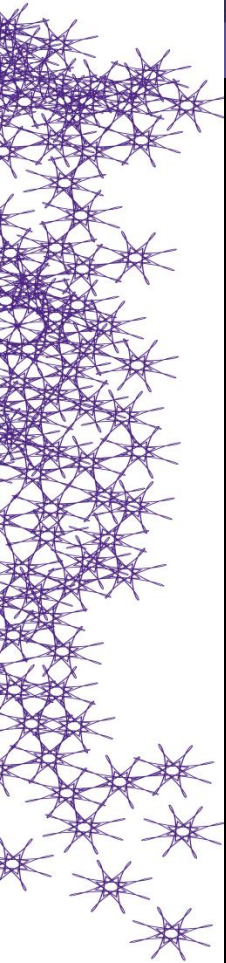
N.B. Team Goal contributed the Brazil instances, and is excluded from the ranking on their own instances.

Round 2: results

Instance \ Team	Goal	HFT	HySST	Lectio
BrazillInstance2	EXCLUDED	3	2	1
BrazillInstance3	EXCLUDED	3	1	2
BrazillInstance4	EXCLUDED	3	1.9	1.1
BrazillInstance6	EXCLUDED	3	2	1
FinlandElementarySchool	1.9	4	2.95	1.15
FinlandSecondarySchool2	1	4	2.4	2.6
Aigio 1st High School 2010-2011	1	4	2.8	2.2
ItalyInstance4	1.1	4	3	1.9
KosovaInstance1	1	3	4	2
Kottenpark2003	1.4	4	1.6	3
Kottenpark2005A	1.4	3.6	1.6	3.4
Kottenpark2008	1	4	2.1	2.9
Kottenpark2009	1	4	2	3
Woodlands2009	1.7	4	2.8	1.5
Spanish school	1	4	2	3
WesternGreeceUniversityInstance3	1	3	2	4
WesternGreeceUniversityInstance4	1	4	2	3
WesternGreeceUniversityInstance5	1	4	2	3
Average rank score	1.18	3.64	2.23	2.32

Round 2

AND THE WINNER IS ... GOAL !!!



Round 3

- **Public** archive of instances (XHSTT-ITC2011-hidden).
- Participants can use **unlimited time and resources**.
- **Archive ranking** by average rank score.
- EVENTMAP prize: € 500.



Round 3: instances as in round 2

Instance	Country	Times	Teachers	Rooms	Classes	Students	duration
Instance2	Brazil	25	14		6		150
Instance3	Brazil	25	16		8		200
* Instance4 *	Brazil	25	23		12		300
* Instance6 *	Brazil	25	30		14		350
ElementarySchool	Finland	35	22	21	60		445
SecondarySchool2	Finland	40	22	21	36		566
Aigio 1st HS 2010	Greece	35	37		208		532
Instance4	Italy	36	61		38		1101
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* Kottenpark2003 *	Netherlands	38	75	41	18	453	1203
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WesternGreeceUni4	Greece	35	19		12		262
WesternGreeceUni5	Greece	35	18		6		184

Round 3: results for 5 teams on 6 instances...

Instance \ team	GOAL	HFT	HySST	Lectio	VAGOS
BrazilInstance2	3	5	4	1	2
BrazilInstance3	4	5	3	2	1
BrazilInstance4	5	4	3	2	1
BrazilInstance6	4	5	3	1	2
WesternGreeceUniversityInstance3	1.5	4	3	5	1.5
WesternGreeceUniversityInstance5	2	4	2	5	2
Average rank	2.9	3.8	3	2.7	1.6

- VAGOS submitted only 6 (good!) solutions.
- The scores of GOAL on the Brazil instances should be excluded.

Round 3: results ...

Instance \ team	GOAL	HFT	HySST	Lectio	VAGOS
BrazillInstance2	EXCLUDED	4	3	1	2
BrazillInstance3	EXCLUDED	4	3	2	1
BrazillInstance4	EXCLUDED	4	3	2	1
BrazillInstance6	EXCLUDED	4	3	1	2
FinlandElementarySchool	2.5	2.5	2.5	2.5	ABSENT
FinlandSecondarySchool2	2	4	2	2	ABSENT
Aigio 1st High School 2010-2011	1	4	3	2	ABSENT
ItalyInstance4	2	4	1	3	ABSENT
KosovoInstance1	1	3	2	4	ABSENT
Kottenpark2003	3	4	2	1	ABSENT
Kottenpark2005A	2	3	1	4	ABSENT
Kottenpark2008	1	4	2	3	ABSENT
Kottenpark2009	2	4	1	3	ABSENT
Woodlands2009	1	4	2	3	ABSENT
Spanish school	1	4	3	2	ABSENT
WesternGreeceUniversityInstance3	1.5	4	3	5	1.5
WesternGreeceUniversityInstance4	1	3	2	4	ABSENT
WesternGreeceUniversityInstance5	2	4	2	5	2
Average rank	1.64	3.75	2.25	2.75	3.86

Round 3

AND THE WINNER IS ... GOAL !!!



HANDING OUT CERTIFICATES

International Timetabling Competition 2011

Luca Di Gaspero, Jeff Kingston, Barry McCollum, Gerhard Post, Andrea Schaerf

Supported by:

