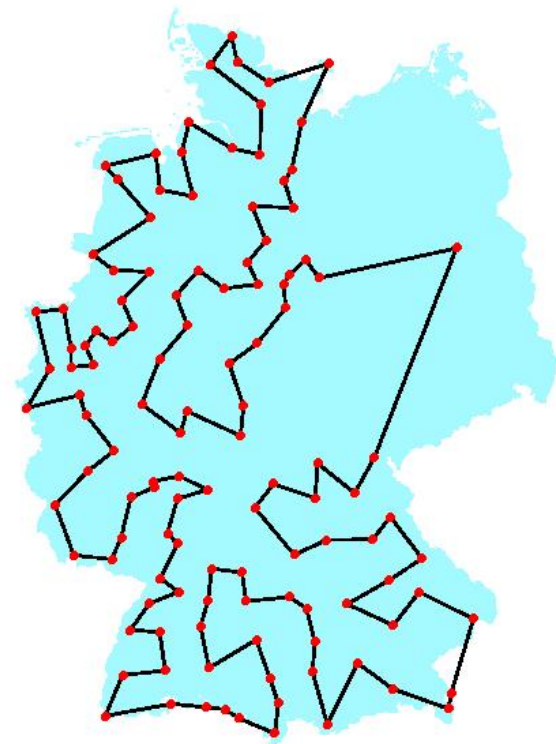


## 2<sup>nd</sup> Artificial Intelligence CUP

Asymmetric Travelling salesman problem, a classical combinatorial optimization problem.

Problem: given  $N$  cities, and a distance function  $d$  between cities (usually time), find a tour that:

- goes through every city once and only once
- minimizes the total distance



# 2<sup>nd</sup> Artificial Intelligence CUP

Information and Knowledge  
Management course

10 benchmark instances

Students have to propose and  
to implement their heuristic  
algorithm and to test it on the  
benchmark set

Max number of seconds x run  
(3 min)

Return the best computed  
solution for each instance

Problems from TSPLIB

<b>Problem</b>	<b>Best Known</b>
ft53	6905
ft70	38673
ftv47	1776
ftv55	1608
ftv70	1950
ftv170	2755
kro124p	36230
rbg323	1326
rbg358	1163
rbg443	2720

# AI CUP 2007 Results

4 students below 1% average error

Andrea Biaggi

Alessandro Gaia

Mike Godenzi

Francesco Rigotti

# AI CUP 2007 Results

THE WINNER IS Andrea Biaggi

Problem	Best Known	Biaggi		Godenzi		Rigotti		Gaia	
ft53	6905	6905	0.00%	6907	0.03%	6915	0.14%	6905	0.00%
ft70	38673	38673	0.00%	38732	0.15%	38677	0.01%	38675	0.01%
ftv47	1776	1776	0.00%	1776	0.00%	1777	0.06%	1776	0.00%
ftv55	1608	1608	0.00%	1608	0.00%	1608	0.00%	1608	0.00%
ftv70	1950	1950	0.00%	1954	0.21%	1959	0.46%	1955	0.26%
ftv170	2755	2755	0.00%	2809	1.96%	2834	2.87%	2944	6.86%
kro124p	36230	36230	0.00%	36333	0.28%	37178	2.62%	36579	0.96%
rbg323	1326	1326	0.00%	1330	0.30%	1329	0.23%	1327	0.08%
rbg358	1163	1163	0.00%	1163	0.00%	1165	0.17%	1165	0.17%
rbg443	2720	2720	0.00%	2720	0.00%	2721	0.04%	2720	0.00%
			0.00%		0.29%		0.66%		0.83%

USI-Informatics 2007  
2<sup>nd</sup> Artificial Intelligence CUP

First Position

**Andrea Biaggi**

Best algorithm for the Asymmetric Traveling Salesman Problem



Lugano, June 22<sup>nd</sup>, 2007

University of Lugano  
Faculty of Informatics

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Prof. Luca Maria Gambardella