DARWIN

Interactive Evolutionary Algorithm for Robust Multi-Objective Optimization

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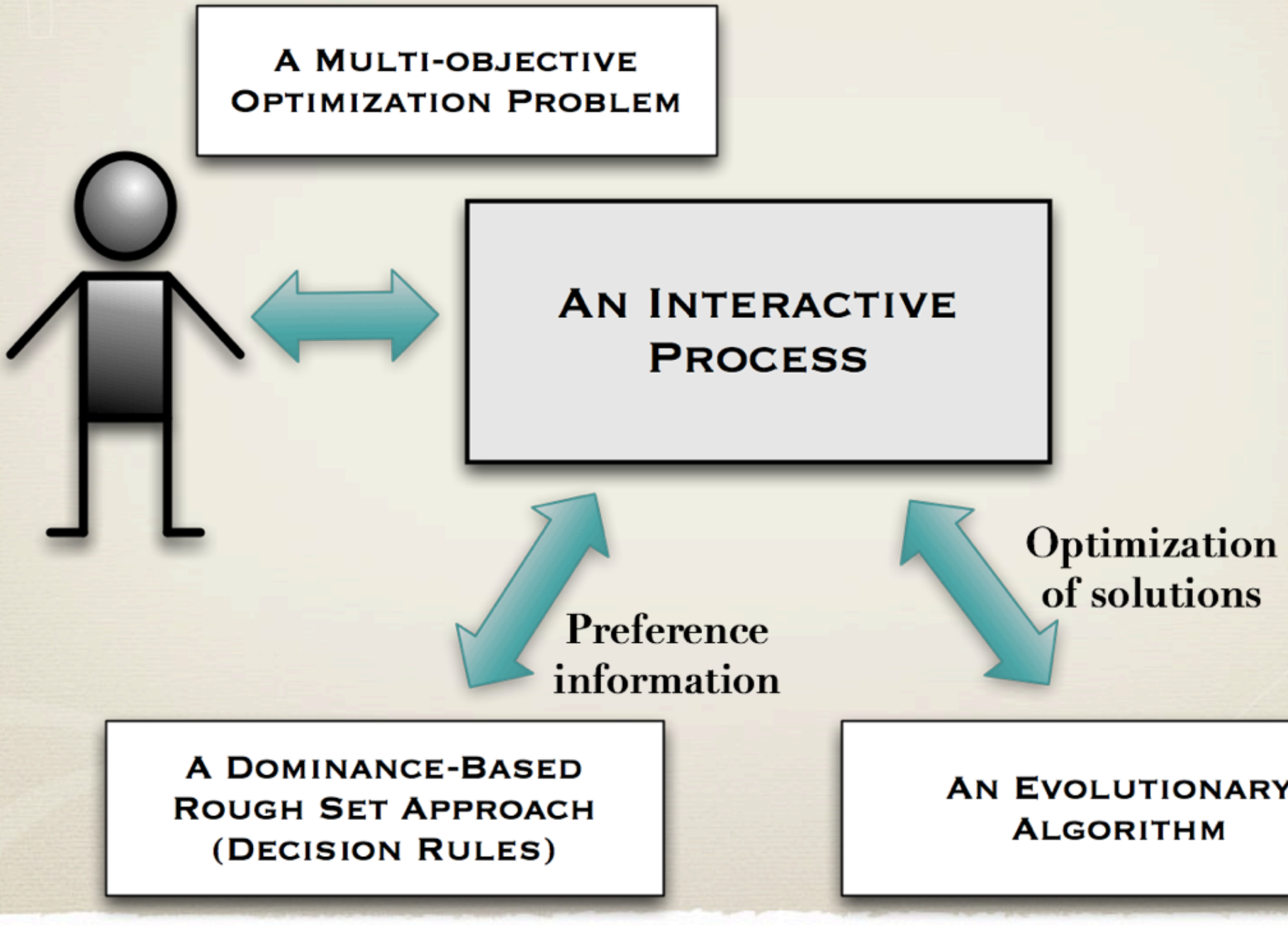
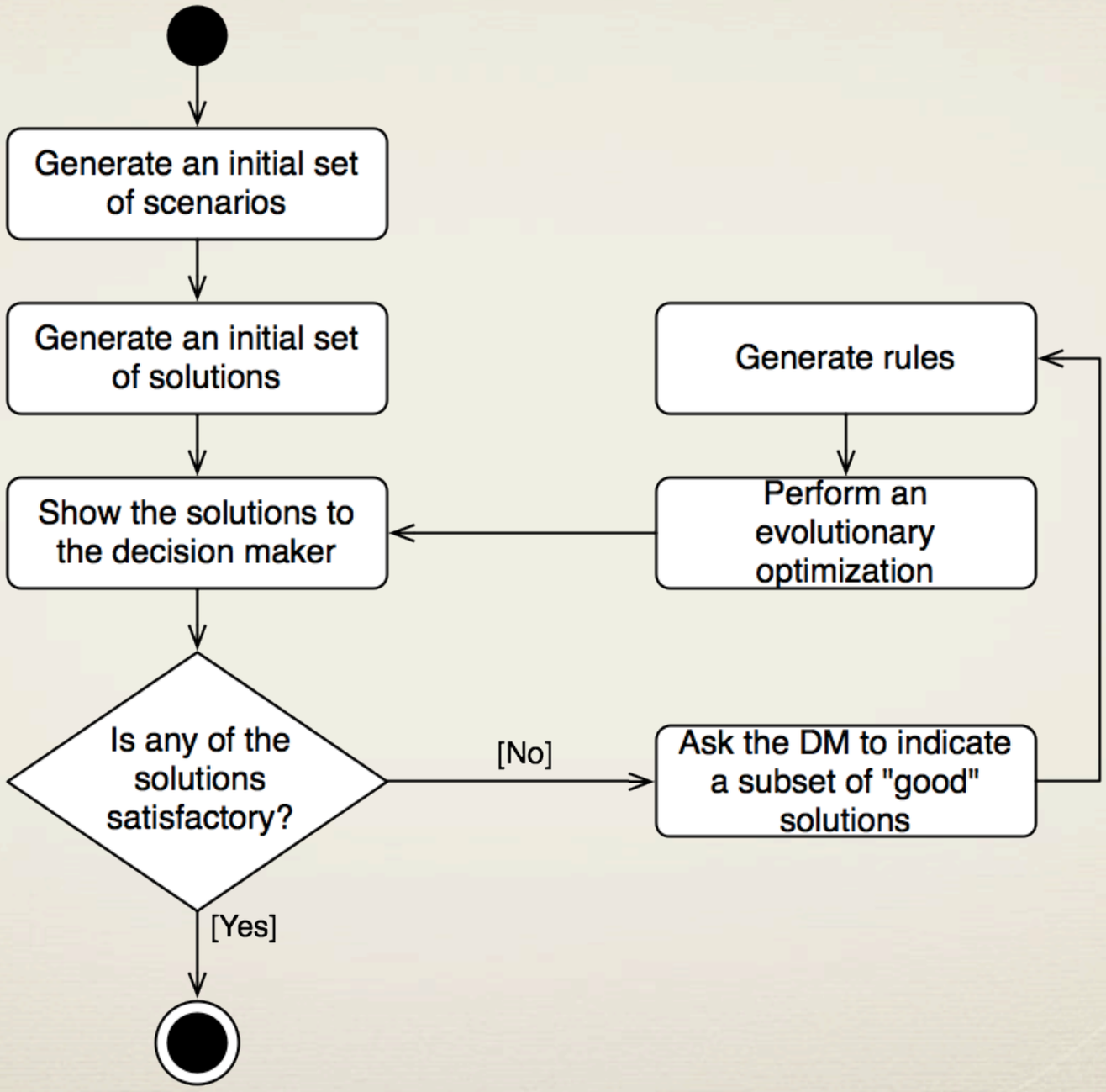
Agenda

1. The Subject
2. The Darwin Algorithm
3. The Application
4. Computational Results

Interactive Evolutionary Algorithm for Robust Multi-Objective Optimization

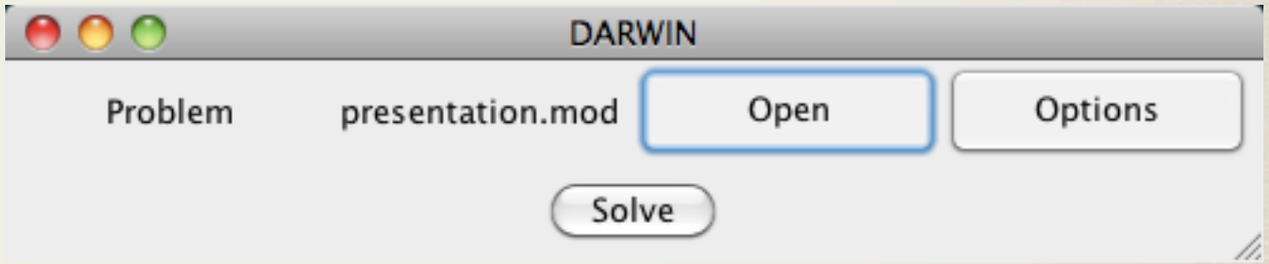


The Darwin Algorithm



The Application

- Easy to use
- A problem parser
- History
- Fine-tuning of parameters
- CSV reports



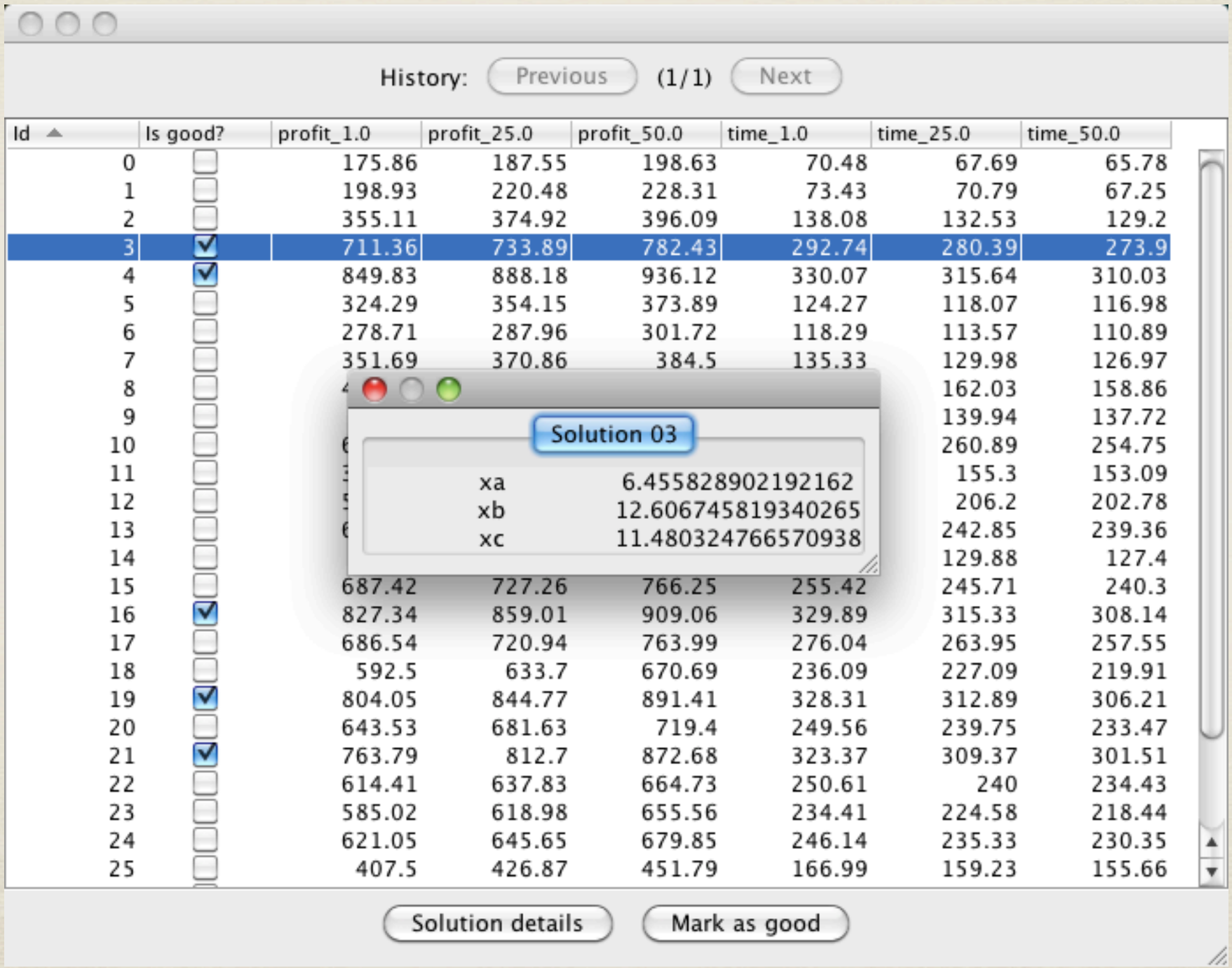
The Application

History: Previous (1/1) Next

Id	Is good?	profit_1.0	profit_25.0	profit_50.0	time_1.0	time_25.0	time_50.0
0	☐	175.86	187.55	198.63	70.48	67.69	65.78
1	☐	198.93	220.48	228.31	73.43	70.79	67.25
2	☐	355.11	374.92	396.09	138.08	132.53	129.2
3	☑	711.36	733.89	782.43	292.74	280.39	273.9
4	☑	849.83	888.18	936.12	330.07	315.64	310.03
5	☐	324.29	354.15	373.89	124.27	118.07	116.98
6	☐	278.71	287.96	301.72	118.29	113.57	110.89
7	☐	351.69	370.86	384.5	135.33	129.98	126.97
8	☐	410.23	439.48	454.06	168.76	162.03	158.86
9	☐	361.4	374.63	387.95	146.62	139.94	137.72
10	☐	691.07	718.74	757.59	272.7	260.89	254.75
11	☐	386.57	402.74	418.06	162.52	155.3	153.09
12	☐	535.01	556.15	576.21	215.59	206.2	202.78
13	☐	667.28	702.67	735.52	254.05	242.85	239.36
14	☐	350	366.08	385.71	135.8	129.88	127.4
15	☐	687.42	727.26	766.25	255.42	245.71	240.3
16	☑	827.34	859.01	909.06	329.89	315.33	308.14
17	☐	686.54	720.94	763.99	276.04	263.95	257.55
18	☐	592.5	633.7	670.69	236.09	227.09	219.91
19	☑	804.05	844.77	891.41	328.31	312.89	306.21
20	☐	643.53	681.63	719.4	249.56	239.75	233.47
21	☑	763.79	812.7	872.68	323.37	309.37	301.51
22	☐	614.41	637.83	664.73	250.61	240	234.43
23	☐	585.02	618.98	655.56	234.41	224.58	218.44
24	☐	621.05	645.65	679.85	246.14	235.33	230.35
25	☐	407.5	426.87	451.79	166.99	159.23	155.66

Solution details Mark as good

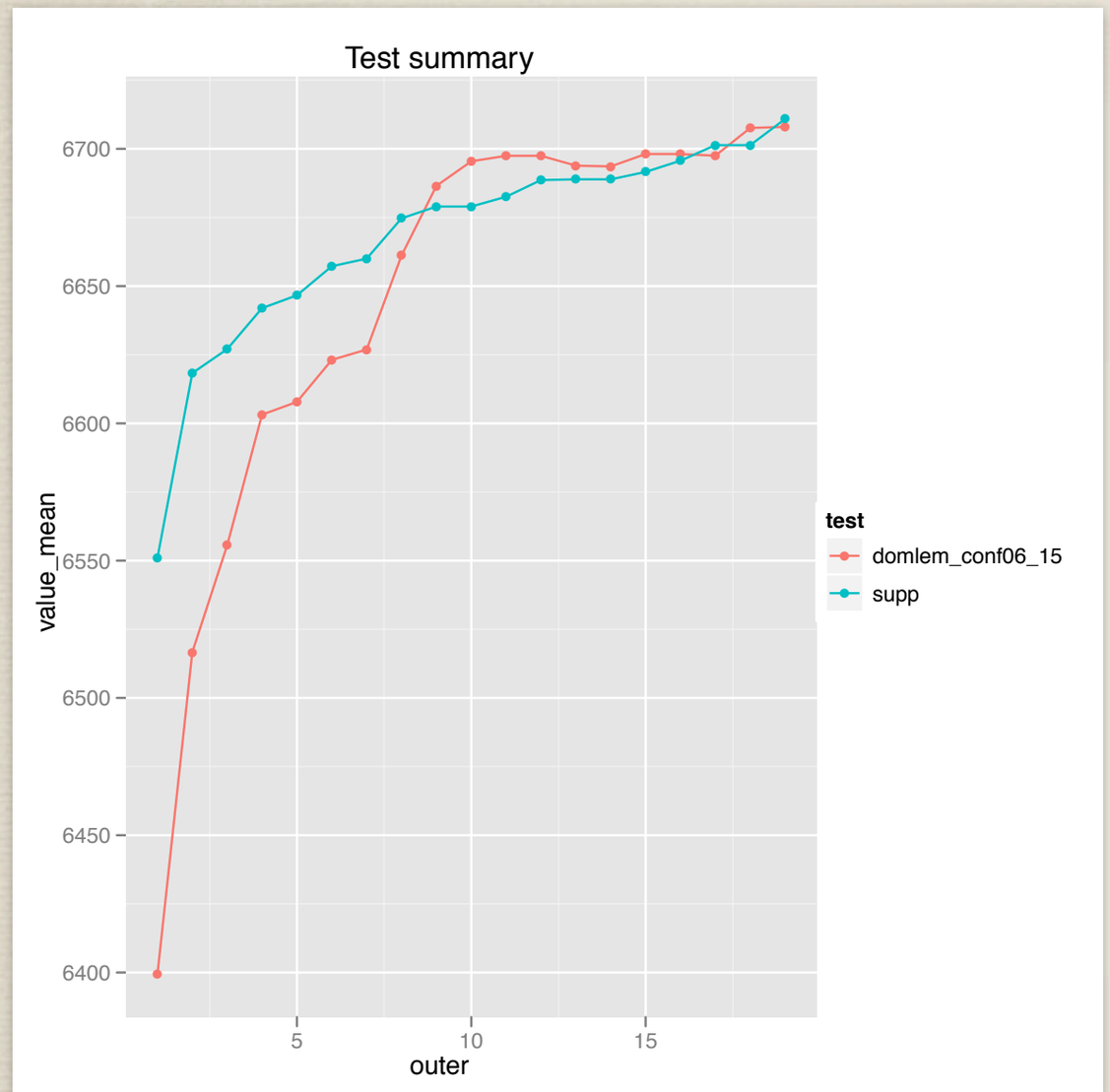
The Application



Computational Results

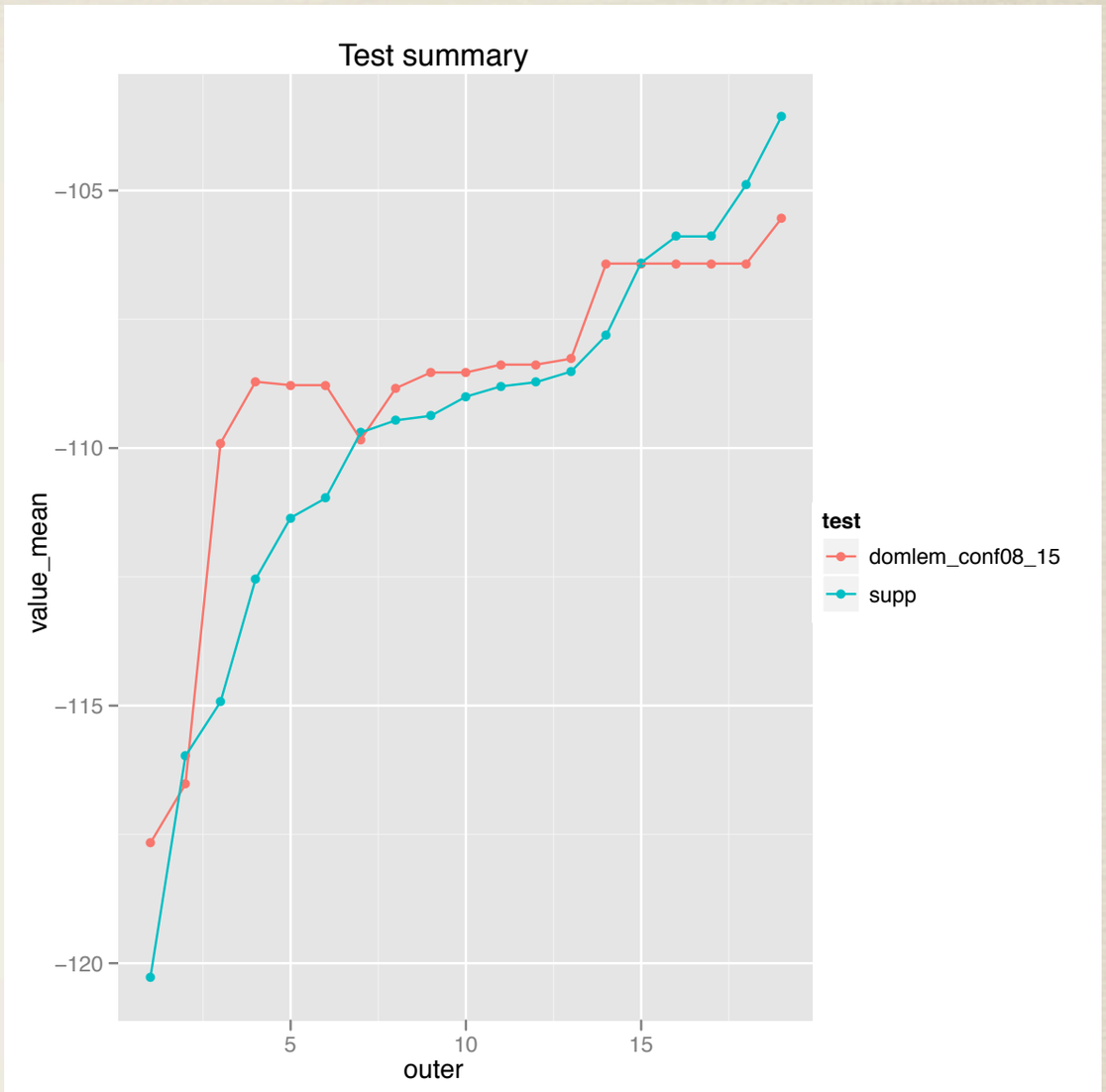
- K. Deb, L. Thiele, M. Laumanns, and E. Zitzler. *Scalable multi-objective optimization test problems.* 2002
- Uncertainty added
- Comparison with the supposed utility function

Mix problem
two criteria



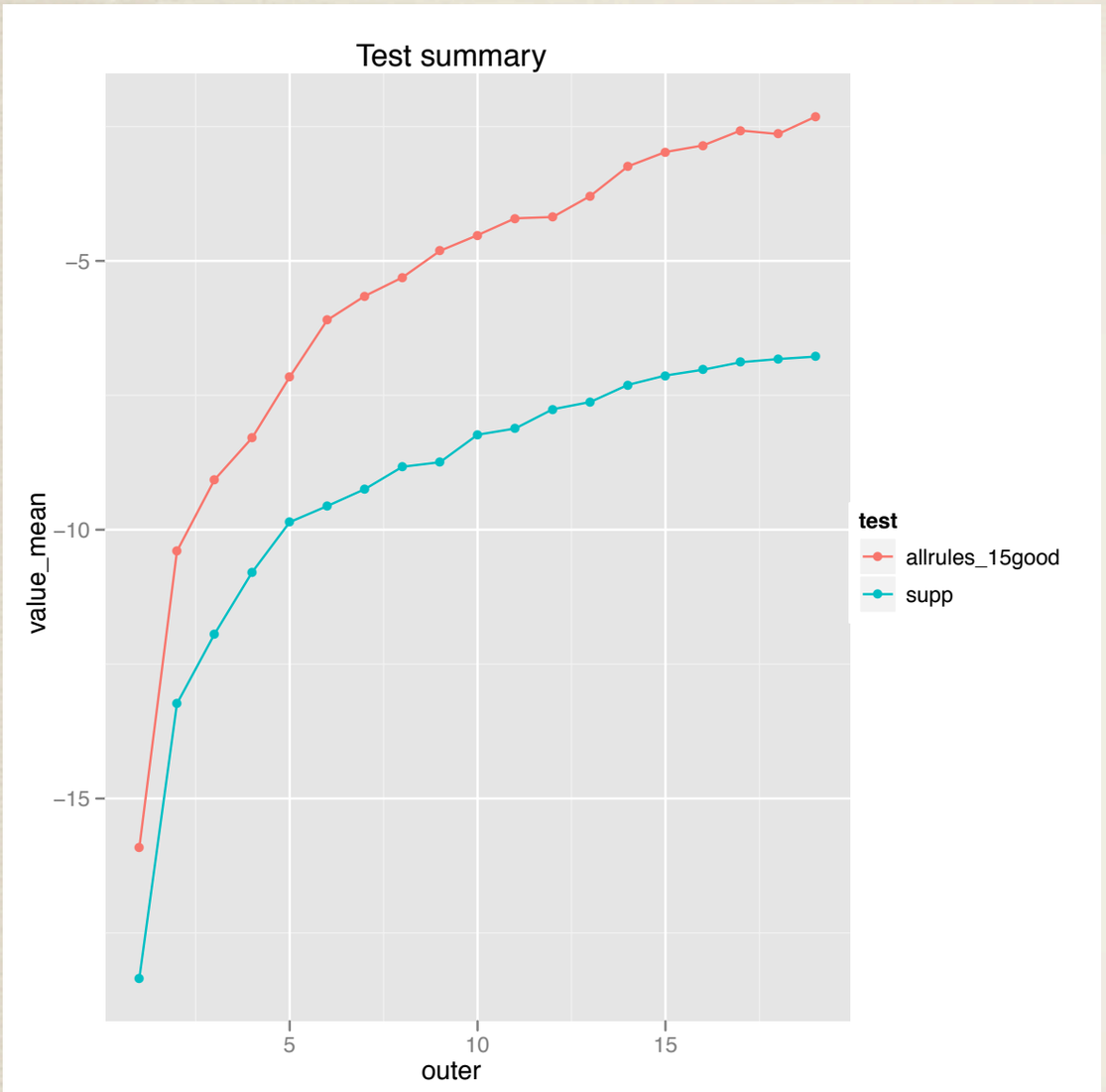
10th +0.25%
20th -0.04%

DTLZ7
four criteria



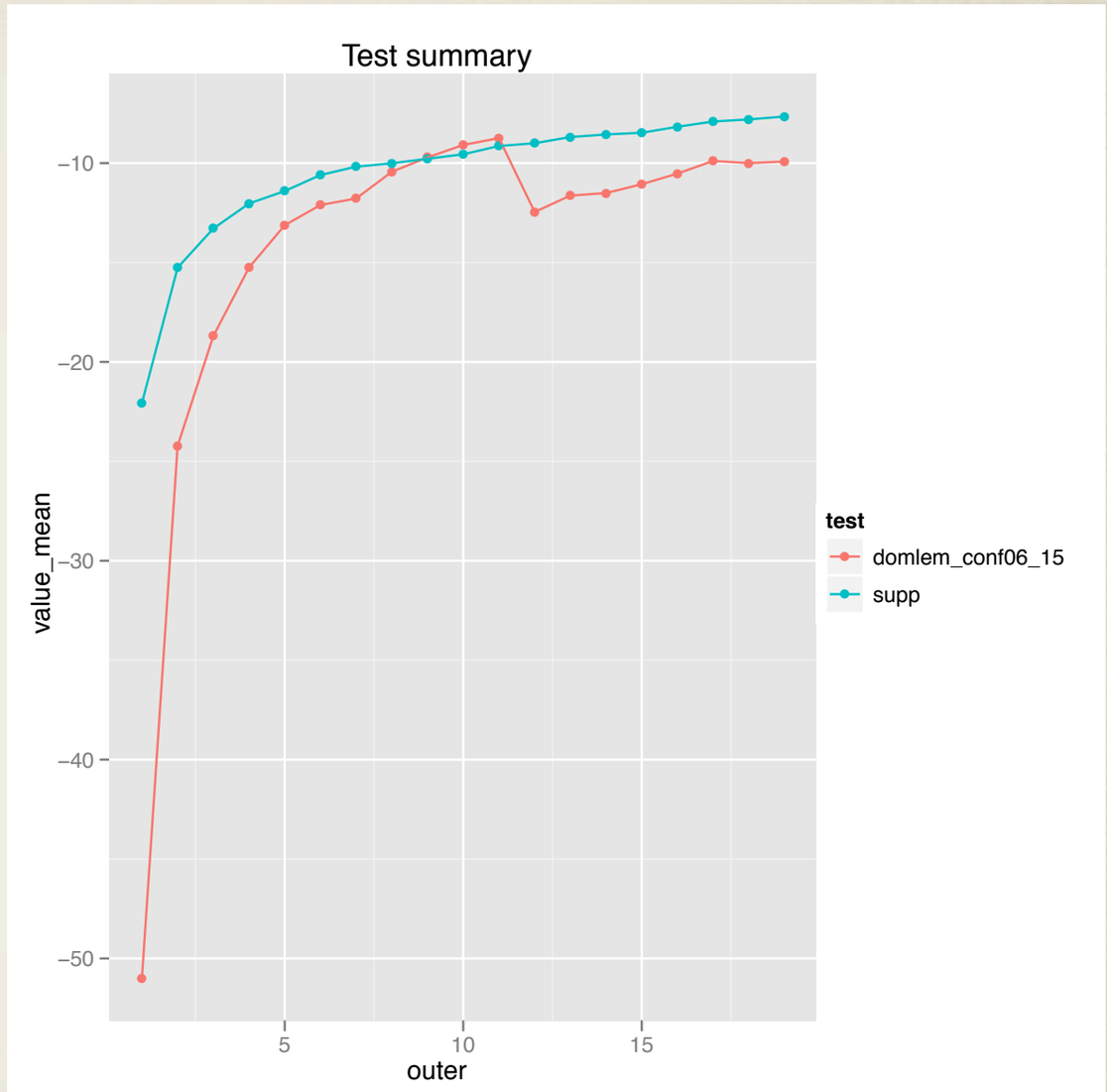
10th +0.77%
20th -1.91%

DTLZ1
four criteria



10th +44.96%
20th +65.86%

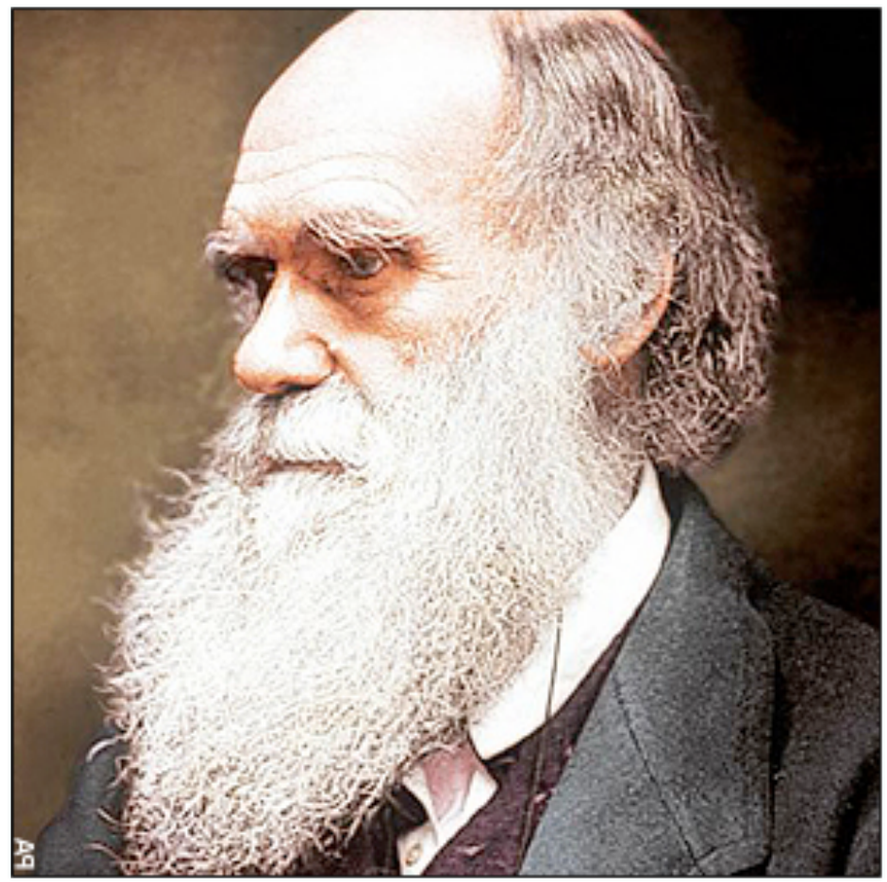
DTLZ1
ten criteria



10th +4.92%
20th -29.55%

Conclusions

* DARWIN can solve MMO problems
* Good performance
* Requires fine-tuning



http://github.com/puszczyk/DarwinDS