Week 10

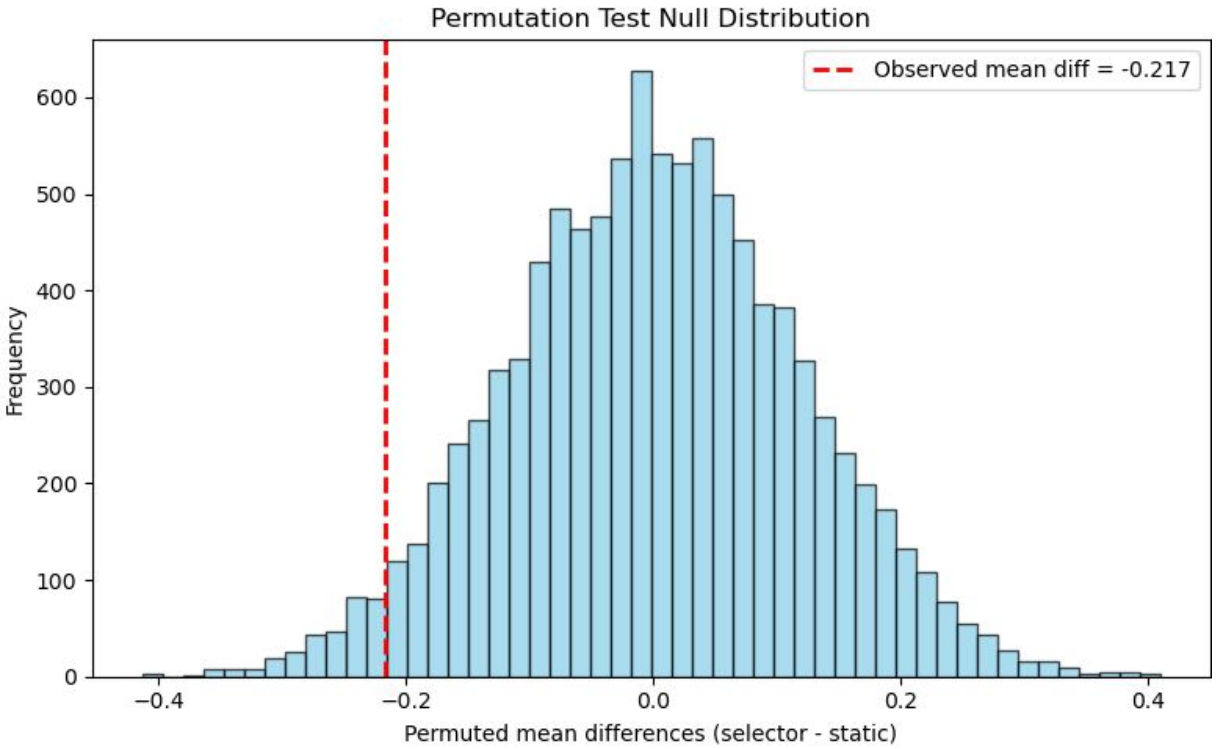
- I noticed a small mistake and had to re-run the experiments, that was a lot of work
- I did a permutation test to show the statistical significance of the selector results (it worked)
- I implemented and started the HPO, it is still running. The best-so-far configuration did not lead to improvements though
- I prepared some slides for Carola
- The next slides contains the newly computed results for the run-specific selector and the function-specific selector, evaluated on instances 6 and 7 and all currently considered switching points
- I also changed the metric

Method	Ratio
static_B64	0.23748752678163765
static_B80	0.2134652618592373
static_B96	0.20568765978497577
static_B56	0.20530240286598572
static_B48	0.20287759956956258
static_B350	0.16607195508988642
static_B72	0.16511660915204543
static_B250	0.1489127378978959
static_B150	0.14298691065125663
static_B400	0.1373226892696086
static_B300	0.13489700959014514
static_B100	0.13267783547154038
static_B550	0.13067635995595175
static_B600	0.11960509096529093
static_B450	0.11064738420552984
static_B200	0.10885623178416887
static_B88	0.0990076532580349
static_B650	0.09131772993687118
selector_precision	0.07530683290316334
static_B500	0.07404858502793543
static_B16	0.035233300427877576
static_B700	0.03487360708338442
static_B32	-0.0003747291292342191
static_B40	-0.028241225242096022
static_B24	-0.08757827577293222
static_B750	-0.11635790764037598
static_B8	-0.1955309433539329
static_B800	-0.27190786149418855
static_B850	-0.64896711138696
static_B900	-0.9744157504060137
static_B950	-2.2033025836716034
static_B1000	-7.075054996121928

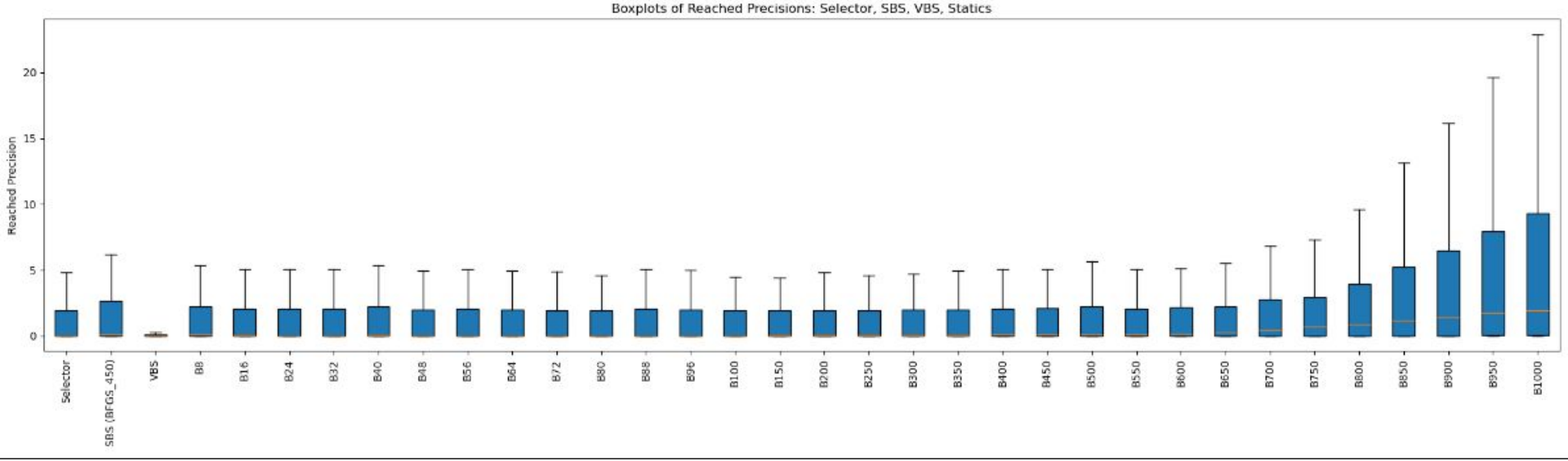
Method	Ratio
selector_precision	0.33141463581869085
static_B64	0.23748758528445274
static_B80	0.2134653222051306
static_B96	0.20568772072759586
static_B56	0.20530246383816414
static_B48	0.20287766072778102
static_B350	0.16607201907197186
static_B72	0.1651166732074286
static_B250	0.1489128031965008
static_B150	0.1429869764045132
static_B400	0.13732275545744546
static_B300	0.13489707596408923
static_B100	0.13267790201574783
static_B550	0.1306764266537199
static_B600	0.11960515851248832
static_B450	0.11064745243999607
static_B200	0.10885630015605903
static_B88	0.09900772238554492
static_B650	0.09131779965438094
static_B500	0.0740486560703987
static_B16	0.03523337444839498
static_B700	0.034873681131498836
static_B32	-0.0003746523767353328
static_B40	-0.028241146351575108
static_B24	-0.08757819232985038
static_B750	-0.11635782198921293
static_B8	-0.1955308516283178
static_B800	-0.27190776390865
static_B850	-0.6489669848720225
static_B900	-0.9744155989214369
static_B950	-2.2033023379022225
static_B1000	-7.075054376573443

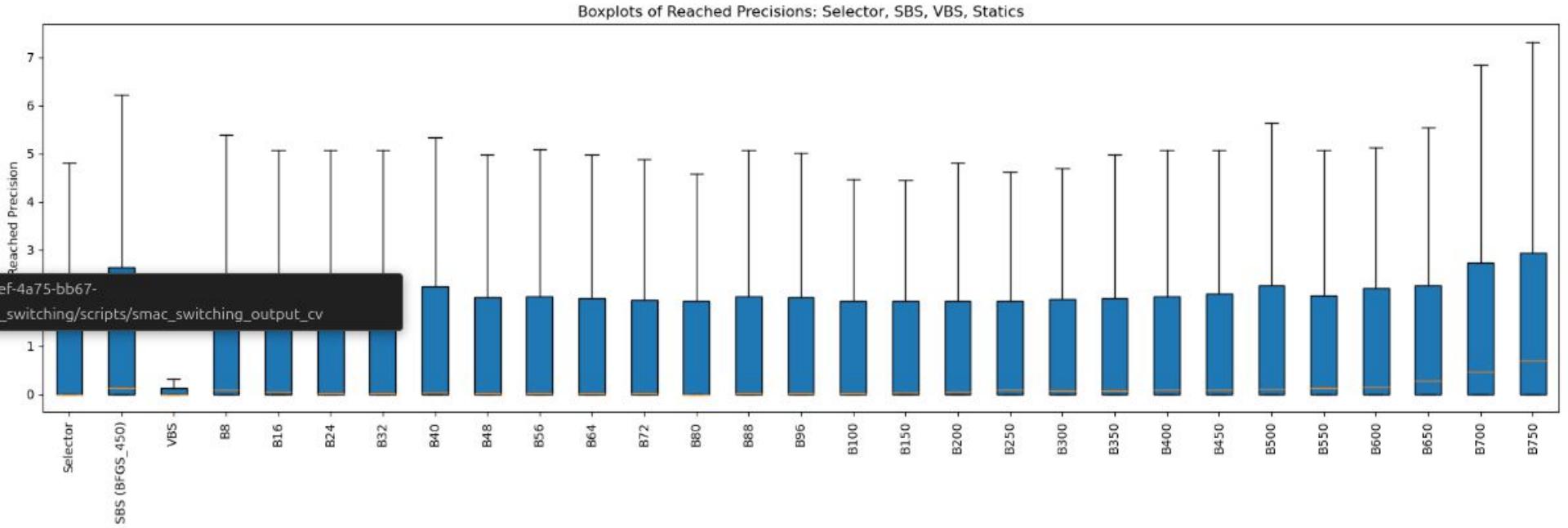
Permutation test

- p-value of 0.03 compared to static_B64
- I used the mean difference
- See implementation on next slide



```python
n_permutations = 10000
perm_diffs = np.zeros(n_permutations)

n = len(selector)

for i in range(n_permutations):
    swap = np.random.rand(n) < 0.5

    perm_selector = np.where(swap, static, selector)
    perm_static   = np.where(swap, selector, static)

    perm_diffs[i] = np.mean(perm_selector - perm_static)

p_value_less = (np.sum(perm_diffs <= observed_diff) + 1) / (n_permutations + 1)
print(f"P-value (selector < static) for budget {budget}: {p_value_less:.6f}")
```


Boxplots of Reached Precisions: Selector, SBS, VBS, Statics
Reached Precision
0
5
10
15
20
Selector
SBS (BFGS_450)
VBS
B8
B16
B24
B32
B40
B48
B56
B64
B72
B80
B88
B96
B100
B150
B200
B250
B300
B350
B400
B450
B500
B550
B600
B650
B700
B750
B800
B850
B900
B950
B1000


Boxplots of Reached Precisions: Selector, SBS, VBS, Statics
Reached Precision
0
1
2
3
4
5
6
7
ef-4a75-bb67-
_switching/scripts/smac_switching_output_cv
Selector
SBS (BFGS_450)
VBS
B8
B16
B24
B32
B40
B48
B56
B64
B72
B80
B88
B96
B100
B150
B200
B250
B300
B350
B400
B450
B500
B550
B600
B650
B700
B750