STRUCTURED ASIC
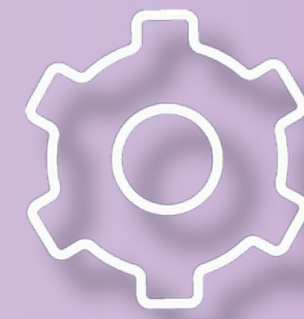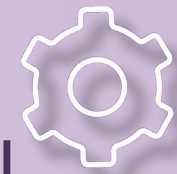
ALL THE FOLLOWING RESULTS ARE FOR 6502 DESIGN

DIGITAL DESIGN 2
INSTRUCTOR: DR.SHALAN
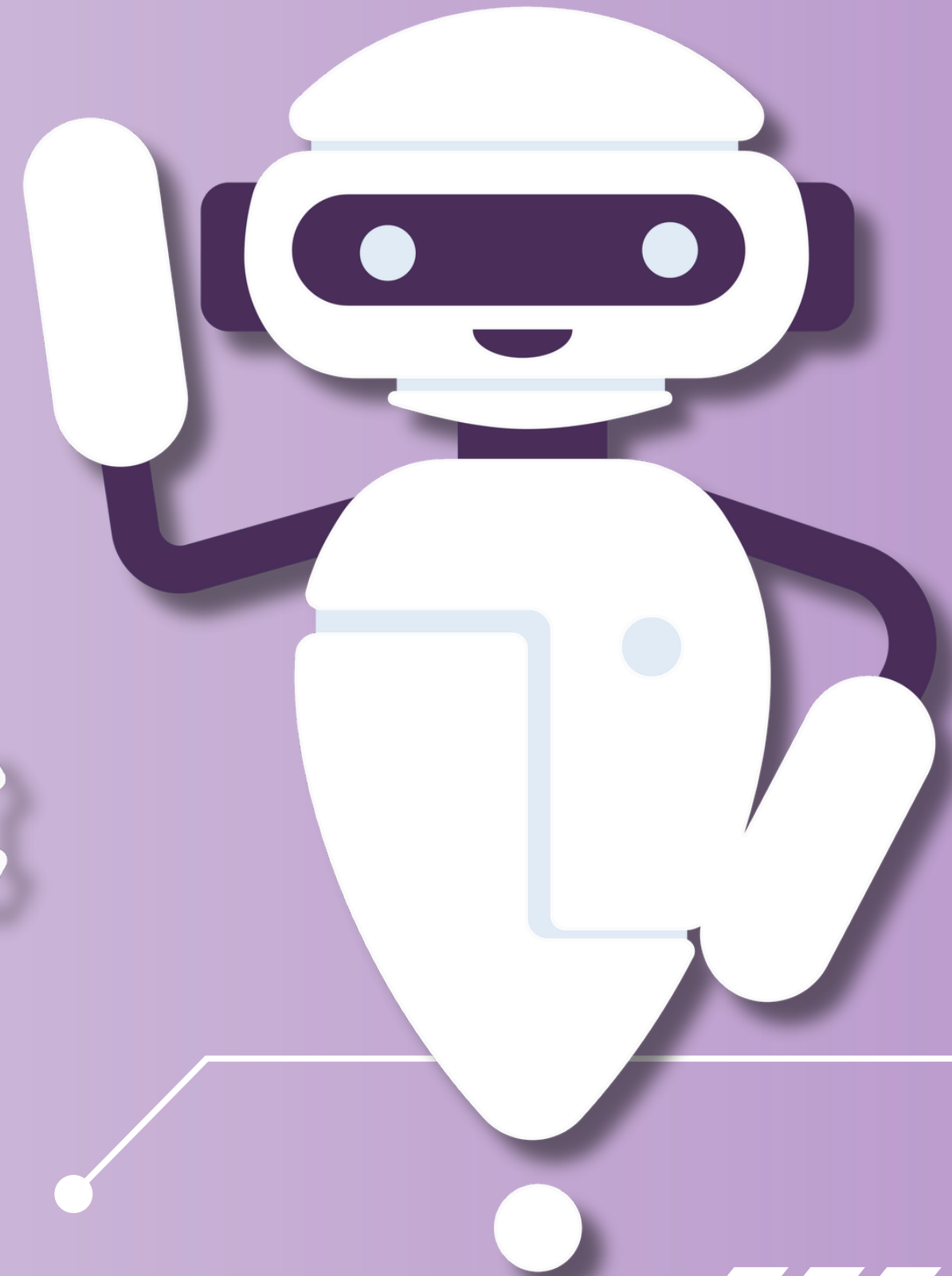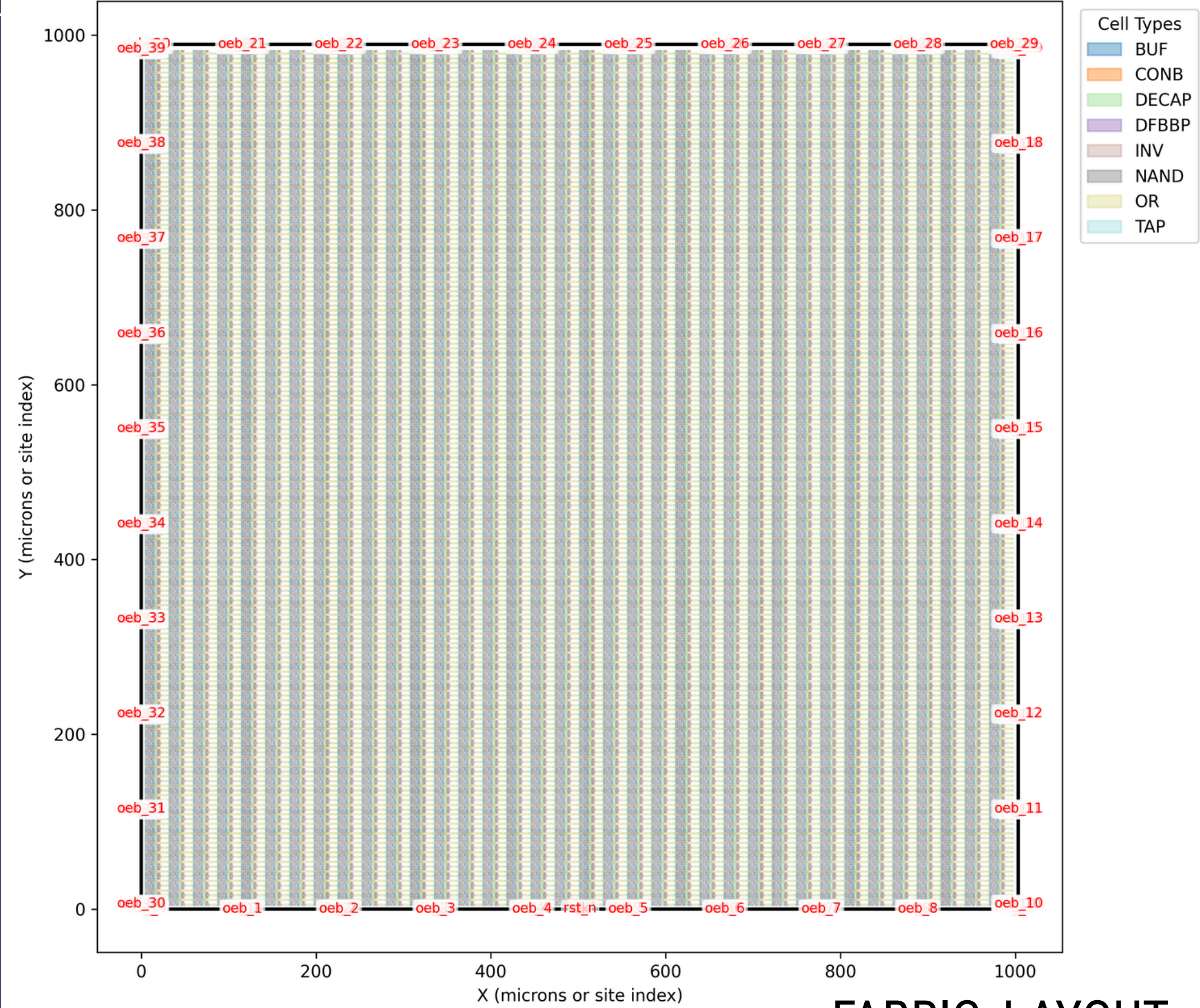
TABLE OF CONTENTS

```
PS D:\Downloads\structured_asic_project-main> python src/validator.py fabric designs/6502_mapped.json

Cell Type       Used / Available Utilization
--------------------------------------------------
BUF              322 / 9720      (3.3%)
CONB               3 / 9720      (0.0%)
DECAP              0 / 19440     (0.0%)
DFBBP            143 / 6480      (2.2%)
INV              360 / 12960     (2.8%)
NAND            1228 / 48600     (2.5%)
OR               843 / 25920     (3.3%)
TAP                0 / 25920     (0.0%)

âœ Validation passed: Design is buildable on fabric.
```

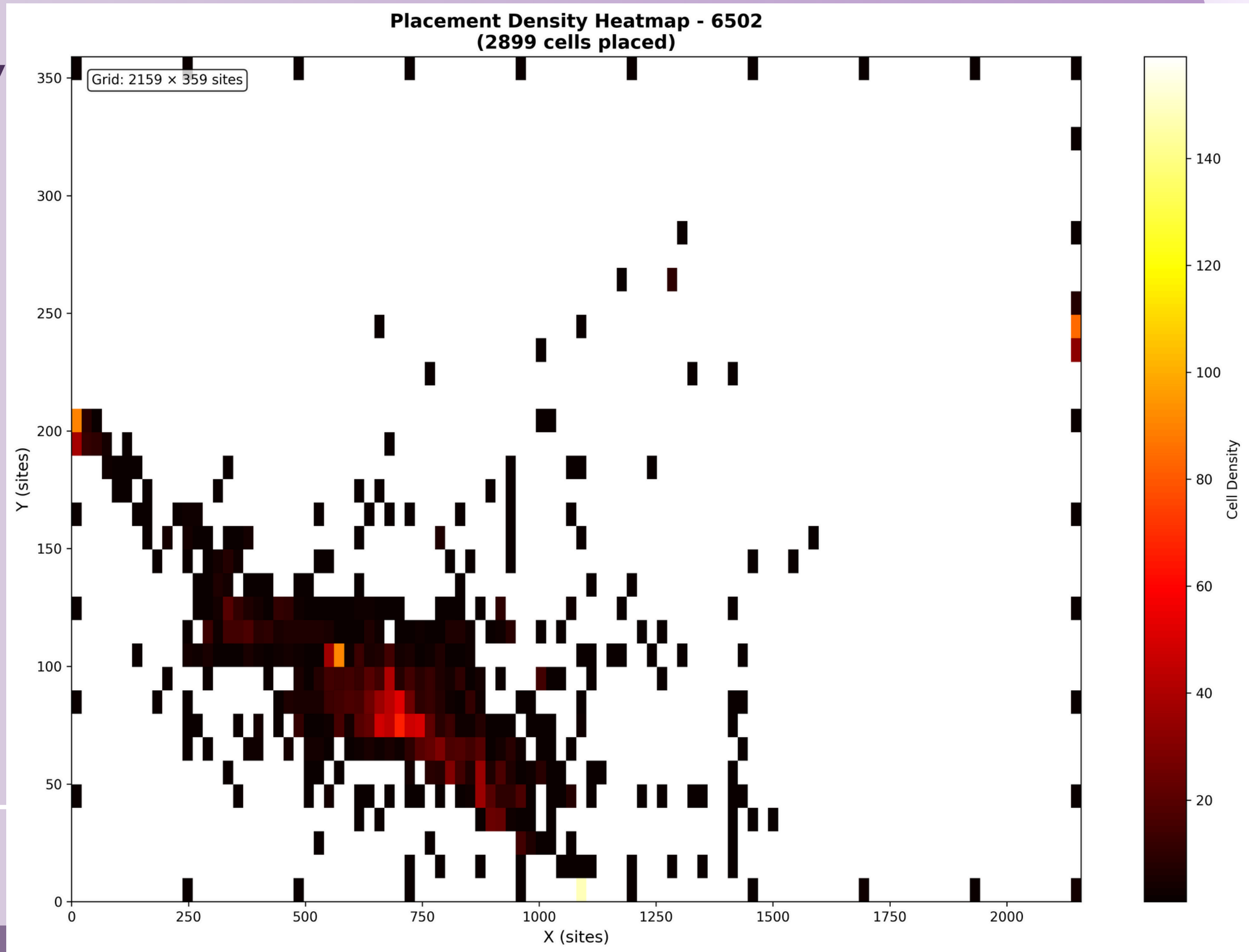# FABRIC VALIDATION RESULTS

FABRIC_LAYOUT

PHASE 2
PLACER ALGORITHM

GREEDY ALGORITHM   GREEDY

SIMULATED ANNEALING   SA

Placement Density Heatmap - 6502
(2899 cells placed)

NET_LENGTH_HISTOGRAM

Net Length Distribution - 6502
(3057 nets)

Average HPWL by Cooling Rate

Average Runtime by Cooling Rate

Average HPWL by Moves per Temperature

Average Runtime by Moves per Temperature
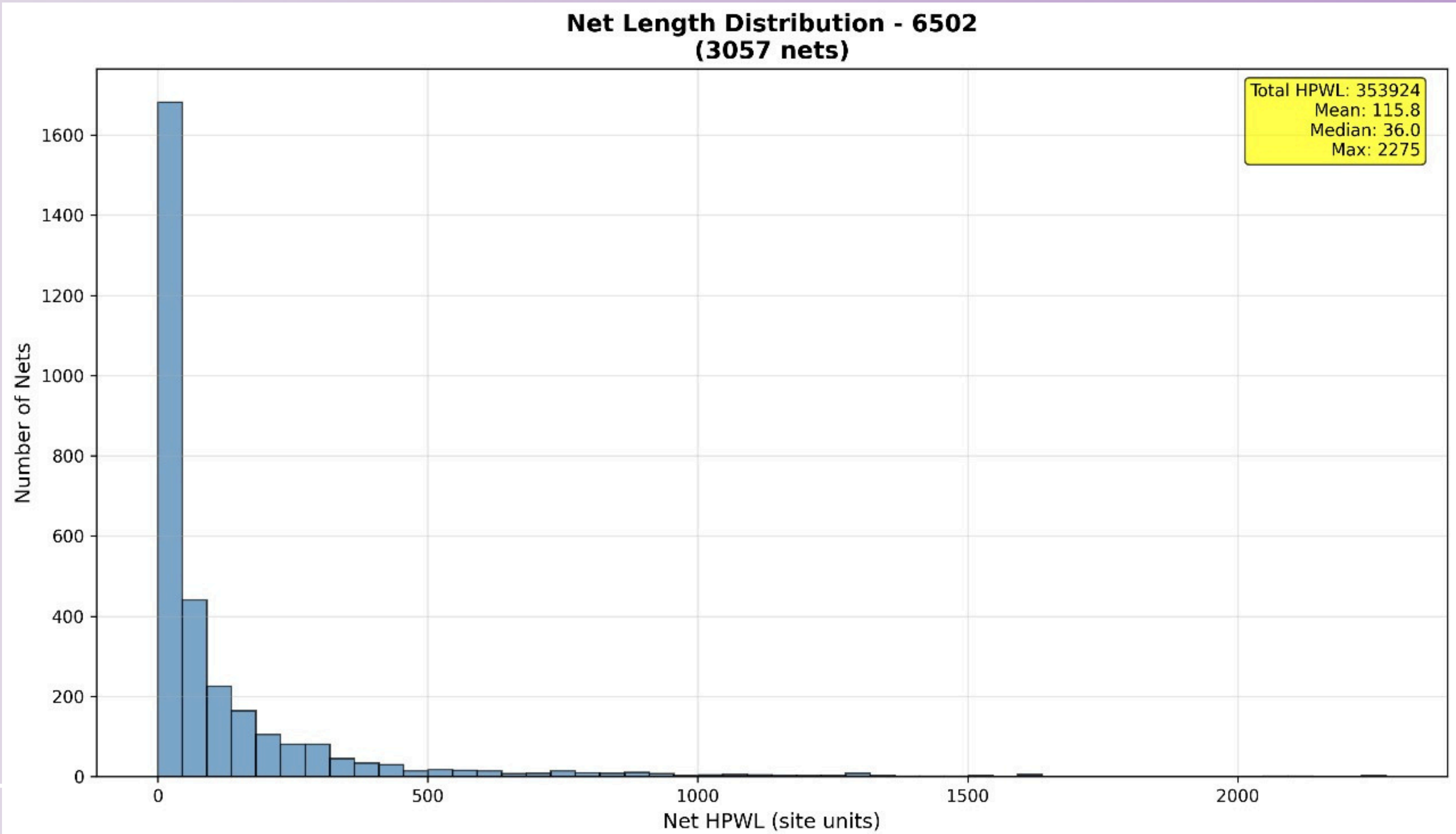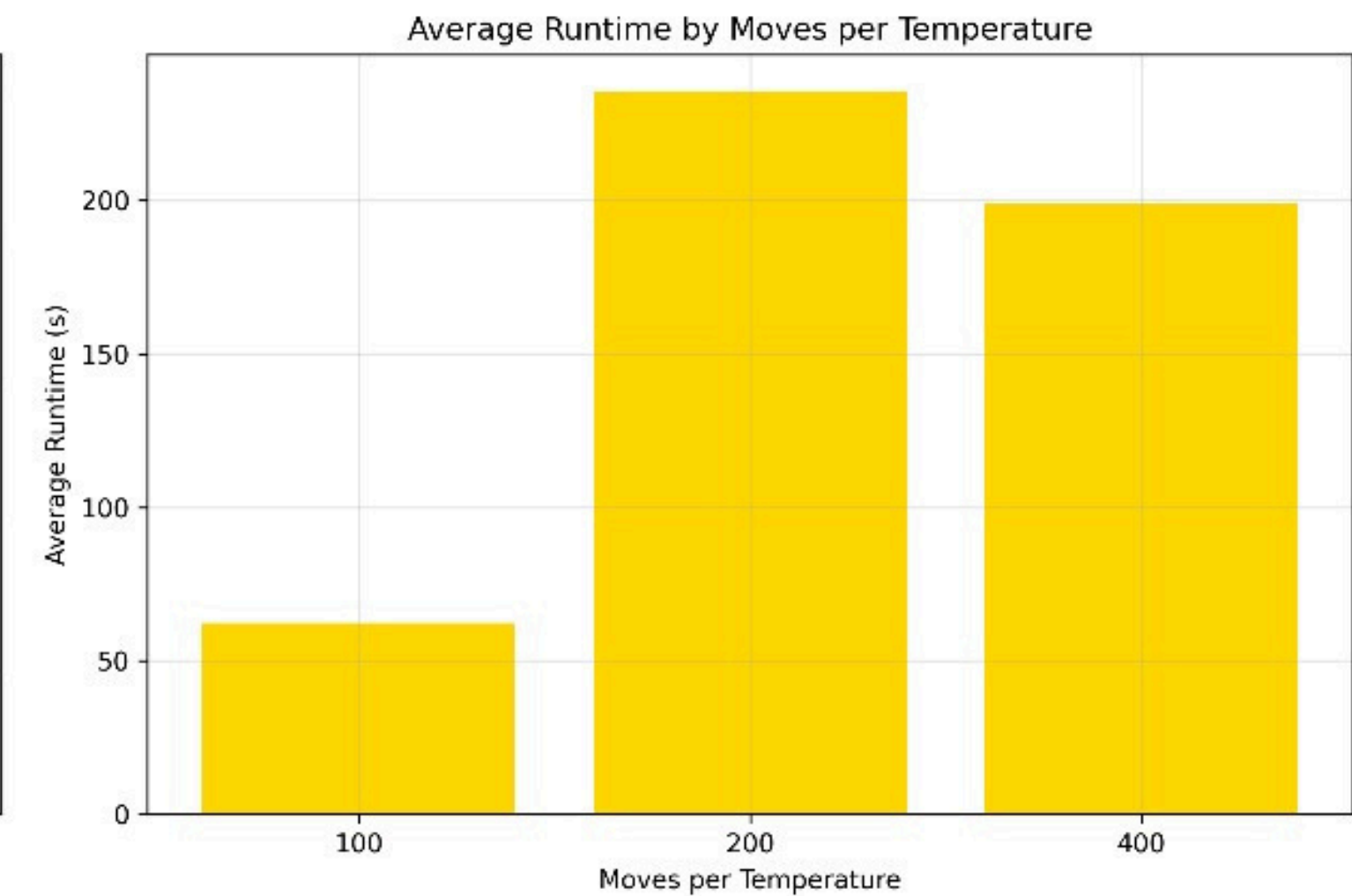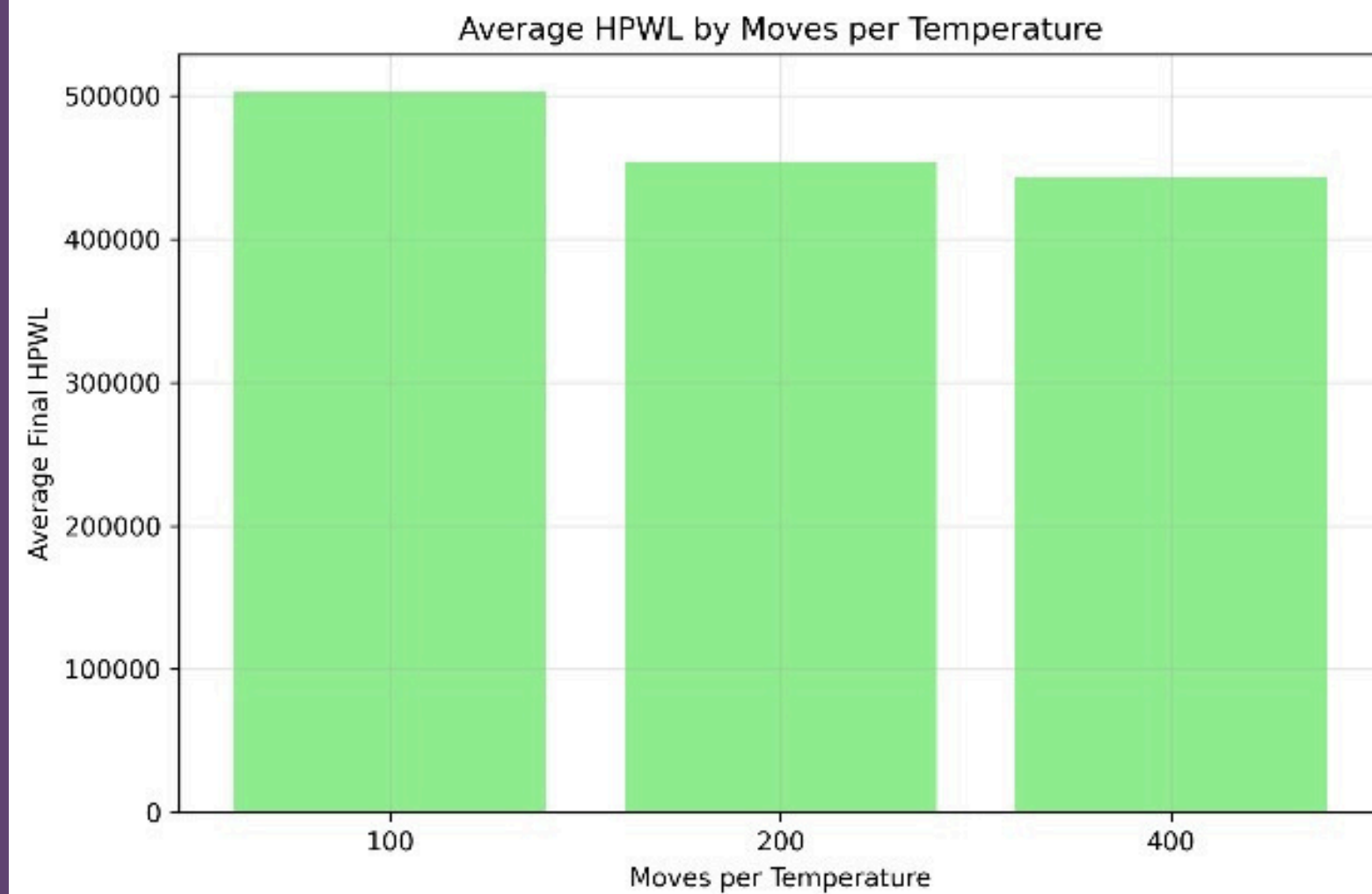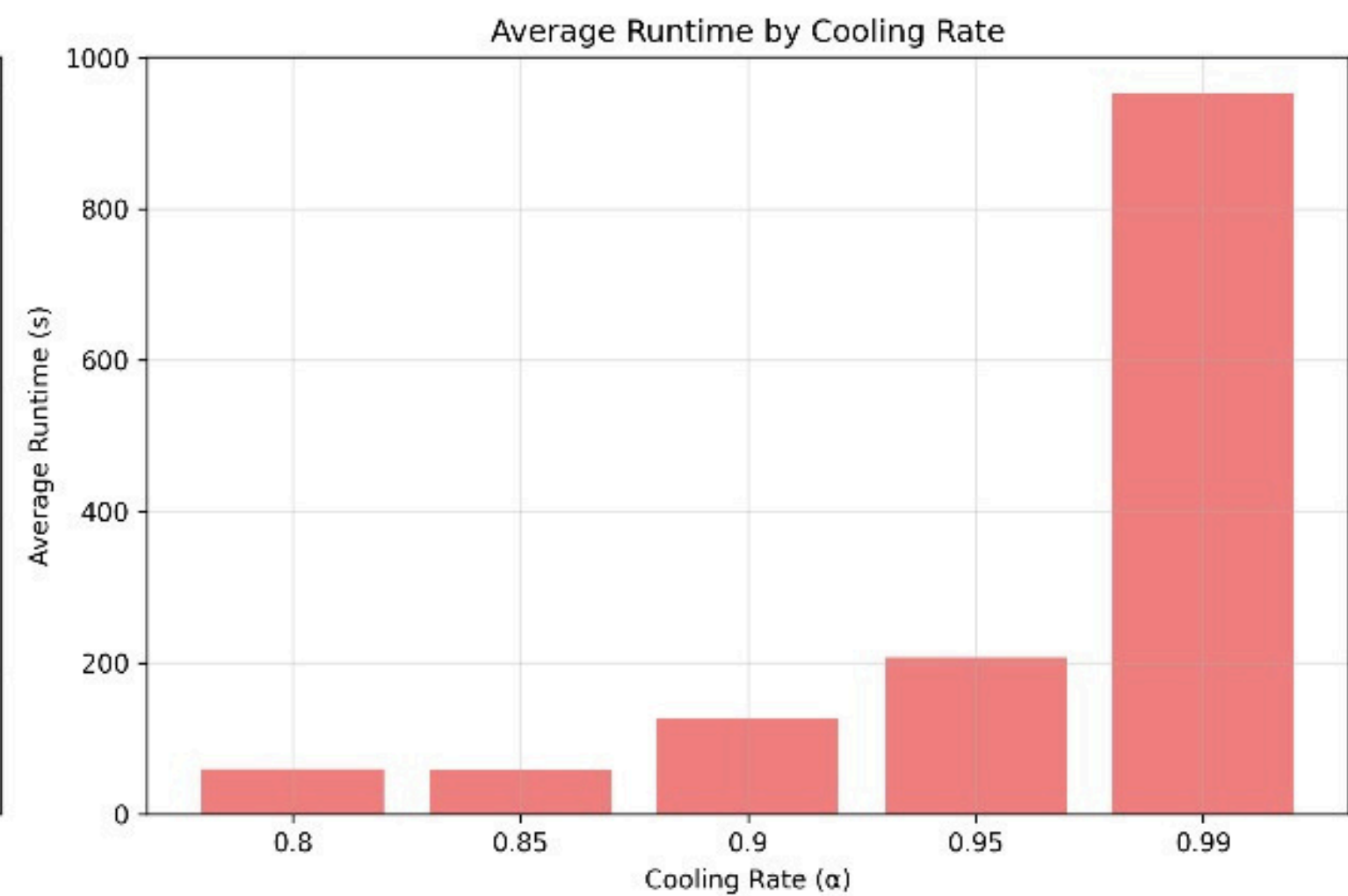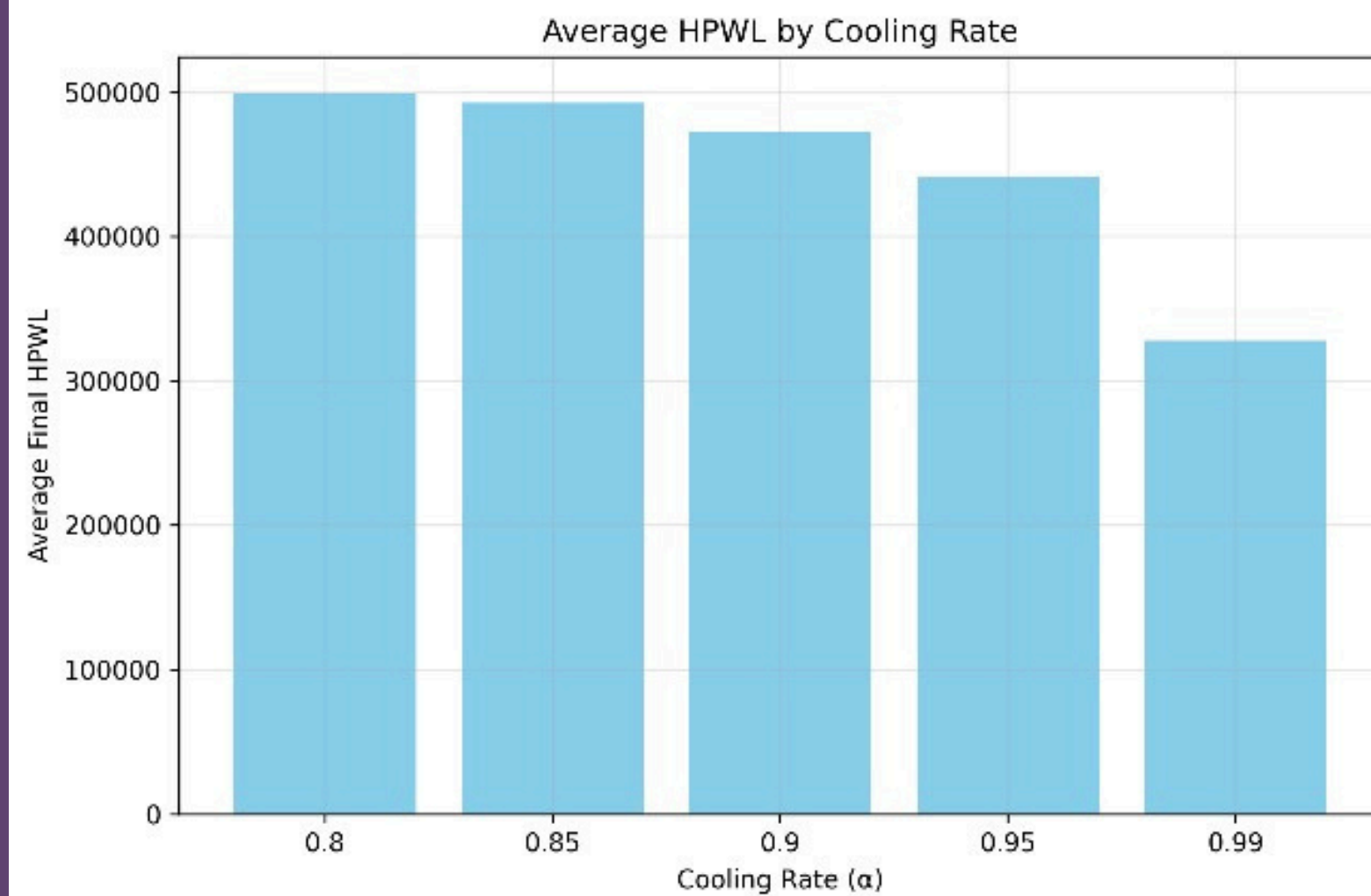
Pareto Frontier - 6502_T100

SA Performance: Runtime vs Final HPWL - 6502_T100\n(Colored by Cooling Rate Î±)

CTS

CTS Tree Visualization
63 Buffers, 143 DFFs

CTS

CTS Tree Visualization - EXACTLY Like Your Image
DFFs (Green) + Buffers (Blue) + Clock at Bottom Center
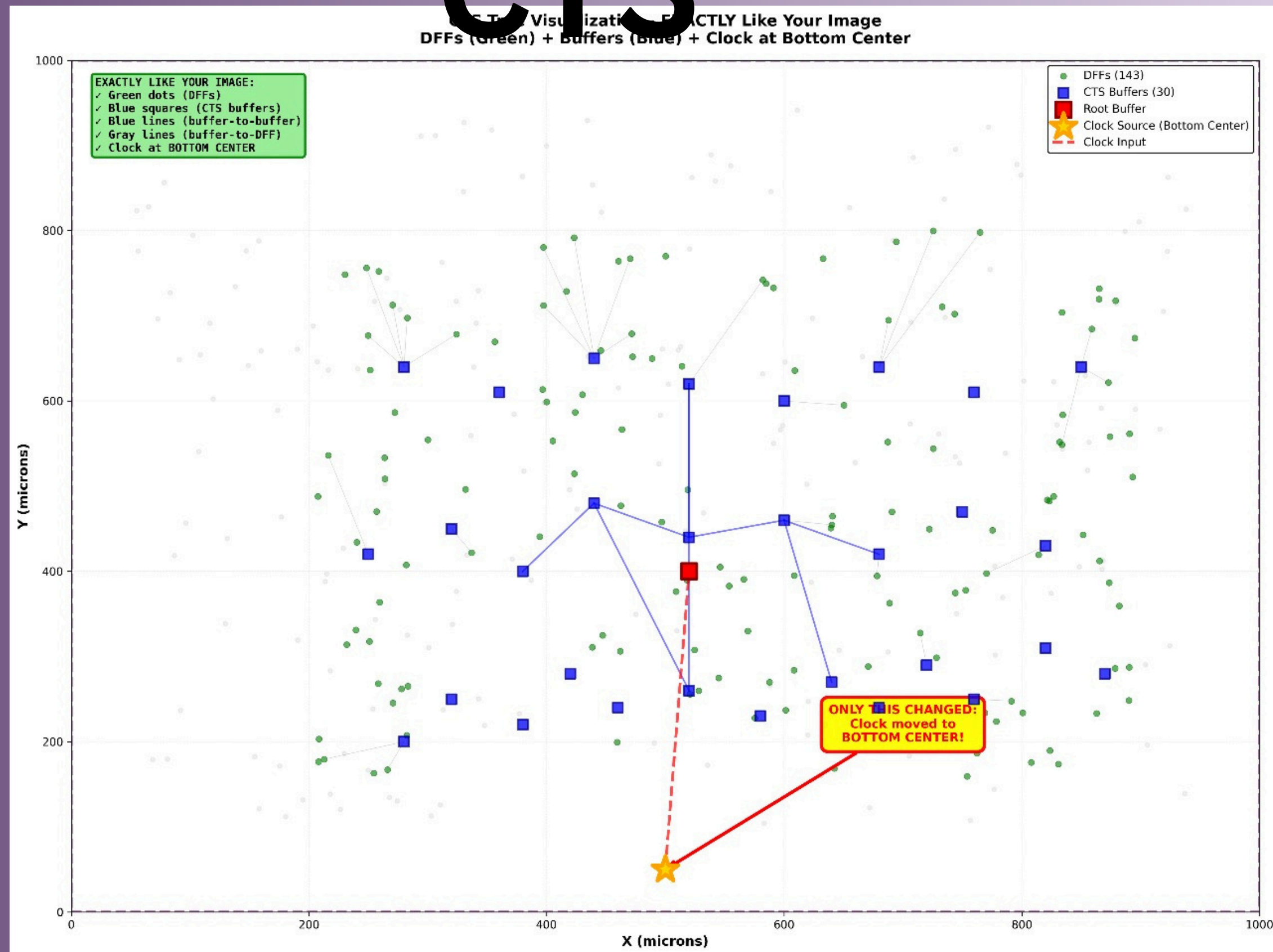
```
[SA] iter=1588    T=0.0117    W=0.00    curr=221958.000    best=221958.000
[SA] iter=1589    T=0.0116    W=0.00    curr=221952.000    best=221952.000
[SA] iter=1590    T=0.0115    W=0.00    curr=221935.000    best=221935.000
[SA] iter=1591    T=0.0114    W=0.00    curr=221933.000    best=221933.000
[SA] iter=1592    T=0.0113    W=0.00    curr=221925.000    best=221925.000
[SA] iter=1593    T=0.0111    W=0.00    curr=221898.000    best=221898.000
[SA] iter=1594    T=0.0110    W=0.00    curr=221882.000    best=221882.000
[SA] iter=1595    T=0.0109    W=0.00    curr=221864.000    best=221864.000
[SA] iter=1596    T=0.0108    W=0.00    curr=221848.000    best=221848.000
[SA] iter=1597    T=0.0107    W=0.00    curr=221828.000    best=221828.000
[SA] iter=1598    T=0.0106    W=0.00    curr=221820.000    best=221820.000
[SA] iter=1599    T=0.0105    W=0.00    curr=221800.000    best=221800.000
[SA] iter=1600    T=0.0104    W=0.00    curr=221785.000    best=221785.000
[SA] iter=1601    T=0.0103    W=0.00    curr=221782.000    best=221782.000
[SA] iter=1602    T=0.0102    W=0.00    curr=221766.000    best=221766.000
[SA] iter=1603    T=0.0101    W=0.00    curr=221763.000    best=221763.000
[SA] iter=1604    T=0.0100    W=0.00    curr=221761.000    best=221761.000
[SA] finished. best HPWL = 221761.000
Final SA HPWL = 221761.000
Output saved: /home/g5/Music/structured_asic_project/phase2_greedy/sa_runs/grow_
placement_alpha0.99_beta0.95_T100000_ts1765316855.json

alpha0.99_beta0.95_T100000 finished. Press enter to close...
```
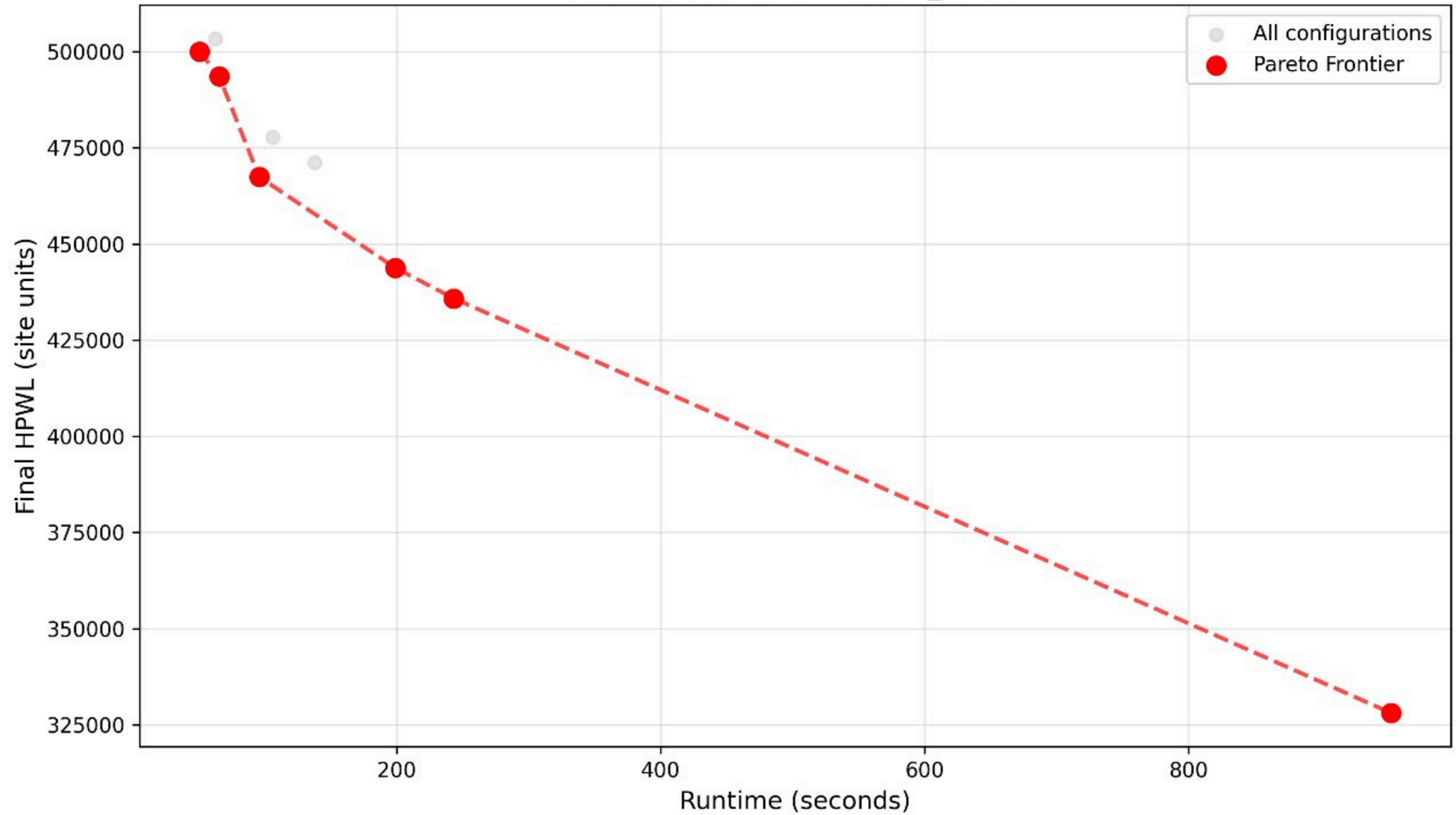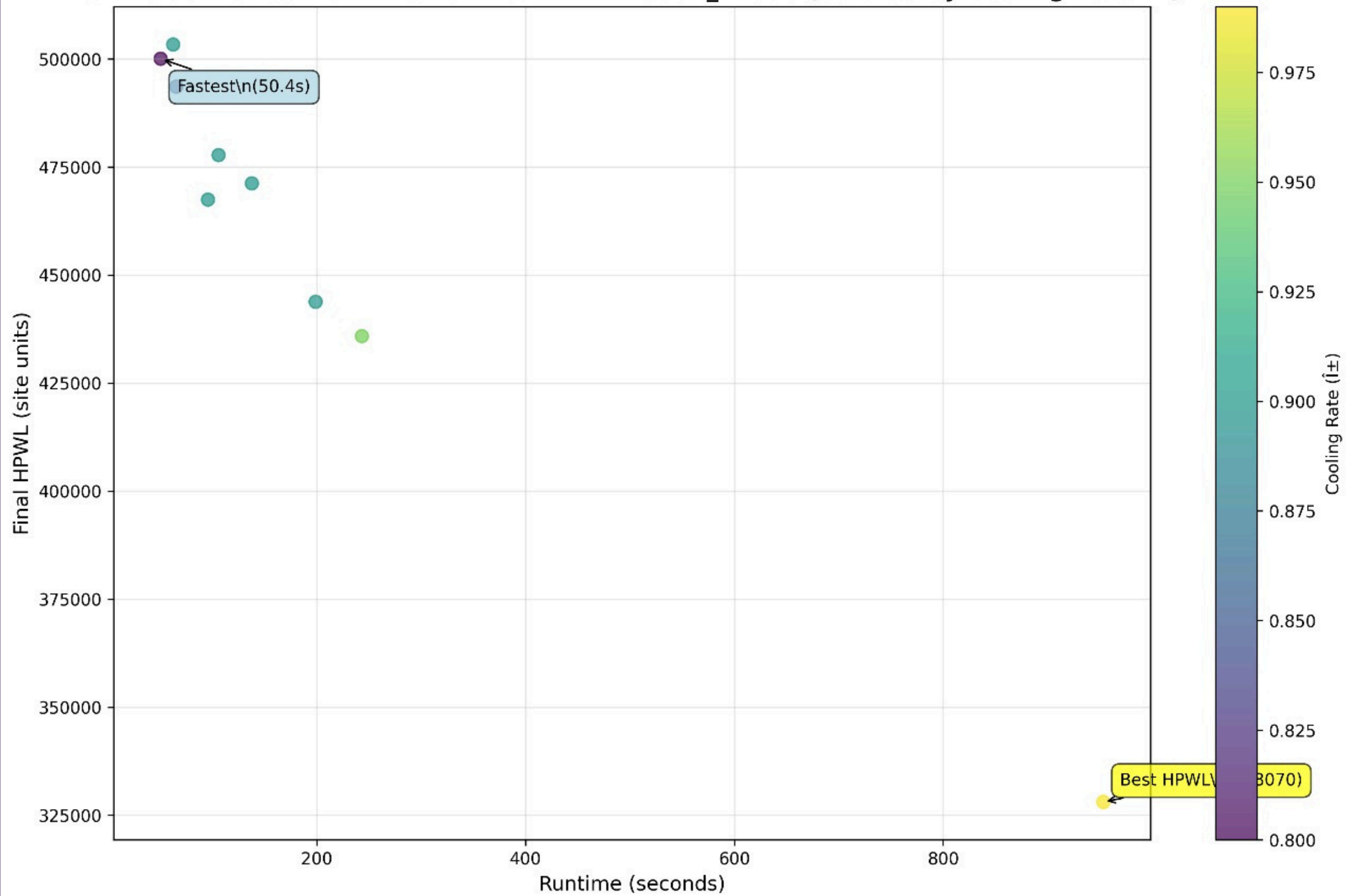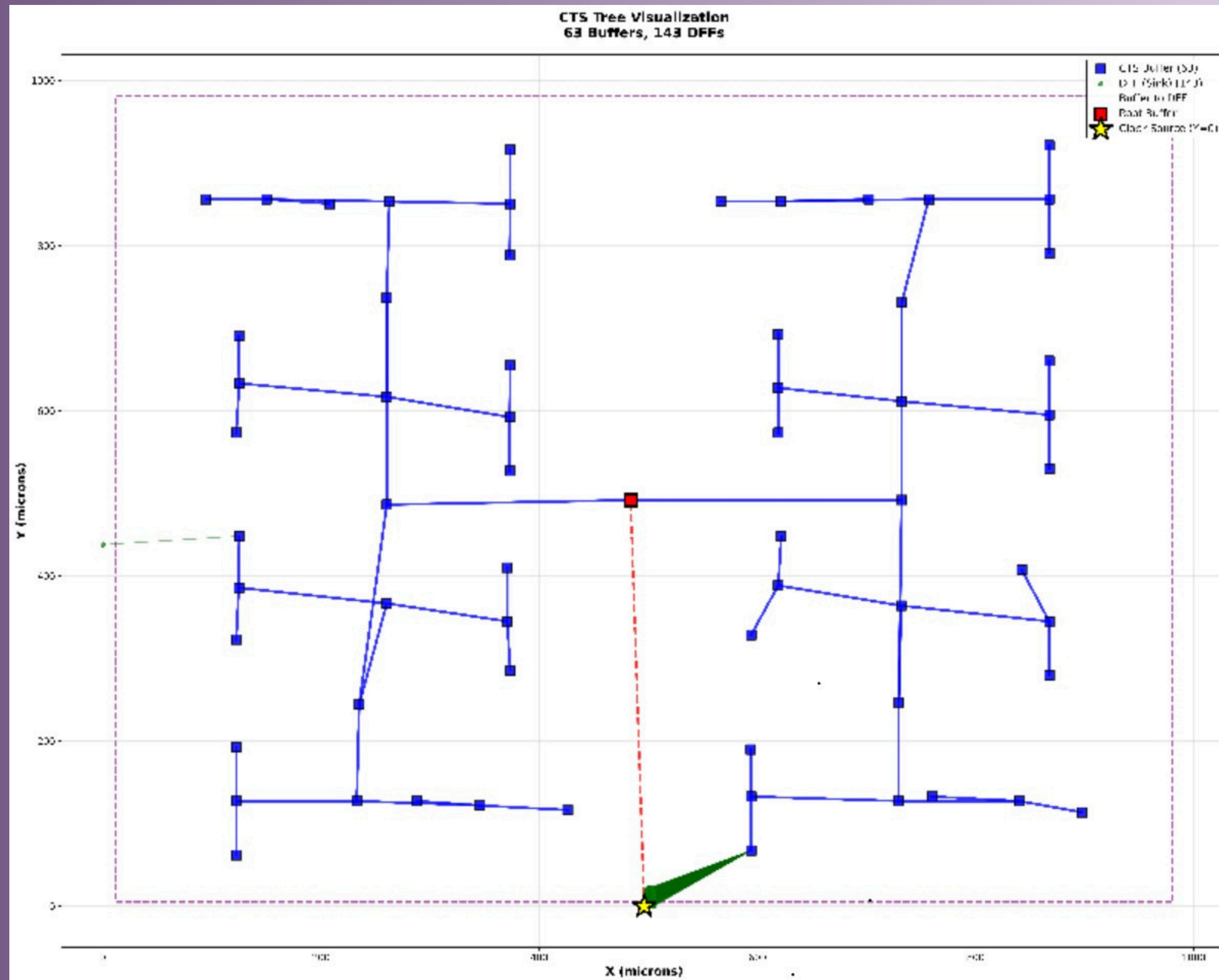
```
clk: 142 cells
oeb_16: 124 cells
in_35: 65 cells
out_0: 2 cells
out_1: 2 cells
out_2: 2 cells
out_3: 2 cells
out_4: 2 cells
out_5: 2 cells


Total occupied sites after seed: 664
====================================


========= GROW STAGE =========
Grow stage completed.

HPWL before SA: 528366.000
[SA] start HPWL = 528366.000  T0=100000.0 alpha=0.99 N=2000 p_refine=0.7 W0=1080
.0 beta=0.9
[SA] iter=  1  T=99000.0000  W=972.00  curr=1501490.000  best=528366.000
[SA] iter=  2  T=98010.0000  W=874.80  curr=1672600.000  best=528366.000
[SA] iter=  3  T=97029.9000  W=787.32  curr=1674563.000  best=528366.000
[SA] iter=  4  T=96059.6010  W=708.59  curr=1675731.000  best=528366.000
[SA] iter=  5  T=95099.0050  W=637.73  curr=1697328.000  best=528366.000
```

```
[SA] iter=1657   T=0.0117   W=0.00   curr=206353.000   best=206353.000
[SA] iter=1658   T=0.0116   W=0.00   curr=206345.000   best=206345.000
[SA] iter=1659   T=0.0115   W=0.00   curr=206332.000   best=206332.000
[SA] iter=1660   T=0.0114   W=0.00   curr=206301.000   best=206301.000
[SA] iter=1661   T=0.0112   W=0.00   curr=206301.000   best=206301.000
[SA] iter=1662   T=0.0111   W=0.00   curr=206301.000   best=206301.000
[SA] iter=1663   T=0.0110   W=0.00   curr=206299.000   best=206299.000
[SA] iter=1664   T=0.0109   W=0.00   curr=206273.000   best=206273.000
[SA] iter=1665   T=0.0108   W=0.00   curr=206249.000   best=206249.000
[SA] iter=1666   T=0.0107   W=0.00   curr=206229.000   best=206229.000
[SA] iter=1667   T=0.0106   W=0.00   curr=206210.000   best=206210.000
[SA] iter=1668   T=0.0105   W=0.00   curr=206202.000   best=206202.000
[SA] iter=1669   T=0.0104   W=0.00   curr=206201.000   best=206201.000
[SA] iter=1670   T=0.0103   W=0.00   curr=206198.000   best=206198.000
[SA] iter=1671   T=0.0102   W=0.00   curr=206171.000   best=206171.000
[SA] iter=1672   T=0.0101   W=0.00   curr=206132.000   best=206132.000
[SA] iter=1673   T=0.0100   W=0.00   curr=206102.000   best=206102.000
[SA] finished. best HPWL = 206102.000
Final SA HPWL = 206102.000
Output saved: /home/g5/Music/structured_asic_project/phase2_greedy/sa_runs/grow_
placement_alpha0.99_beta0.9_T200000_ts1765317309.json

alpha0.99_beta0.9_T200000 finished. Press enter to close...

[SA] iter=850   T=194.9465   W=0.00   curr=657559.000   best=551582.000
```