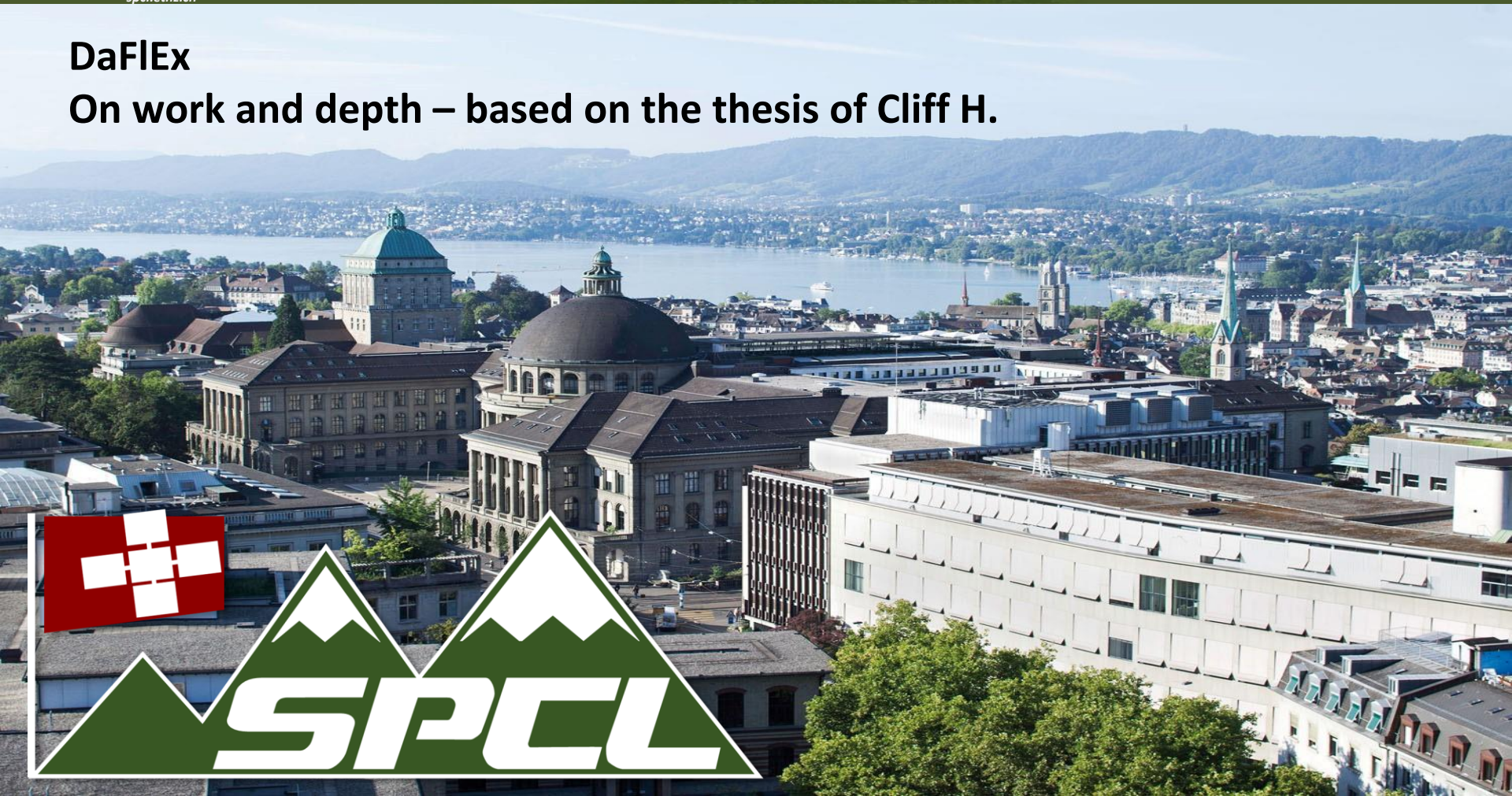
# DaFlEx

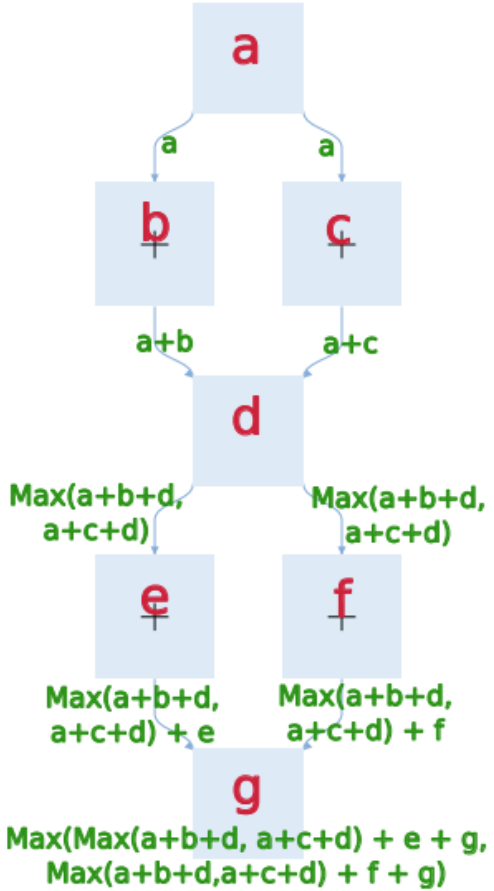
## On work and depth – based on the thesis of Cliff H.



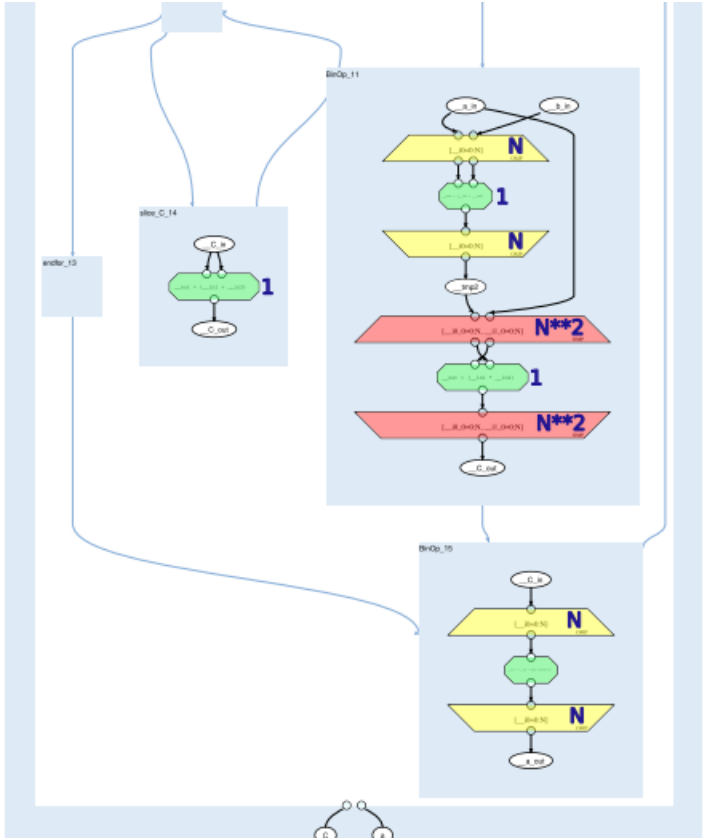
```
1 AnalyzeWorkSDFG (sdfg)
2     foreach state s in sdfg do
3         W_s ← AnalyzeWorkState(s)
4         numExec_s ← number of executions of s
5         W_s ← W_s · numExec_s
6     end
7     Transform sdfg into a DAG
8     W_sdfg ← WorkOnLongestPath(sdfg)
```

$$S_p = \frac{T_1}{T_p} \leq \frac{T_1}{t_\infty} = \frac{W}{D} = A.$$

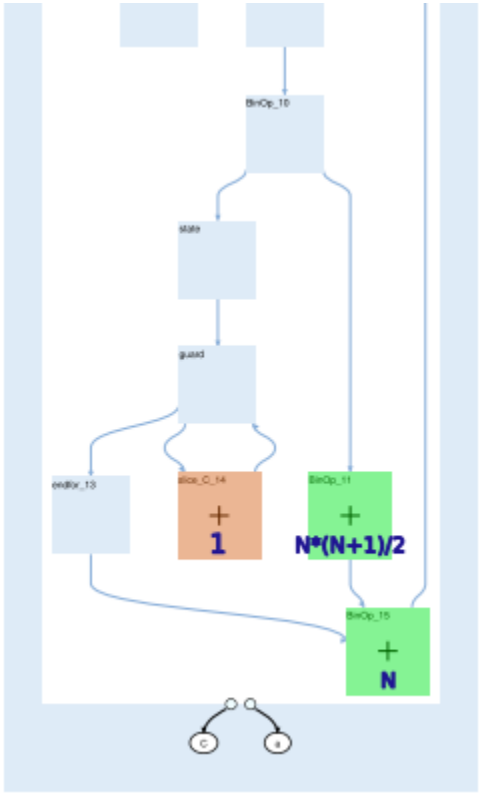
Speedup, Work, Depth



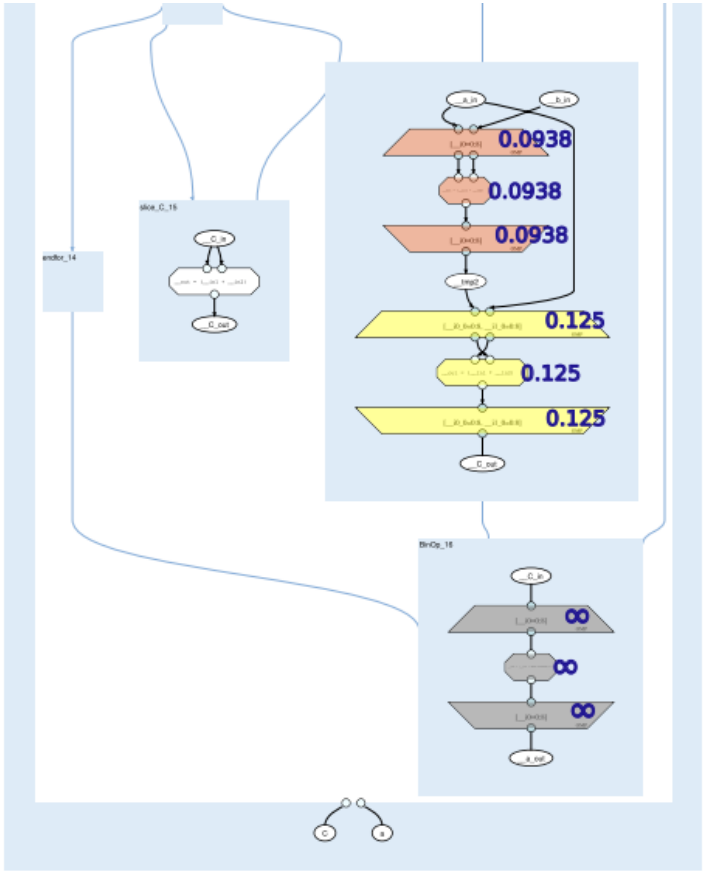
# VS Code overlay - work

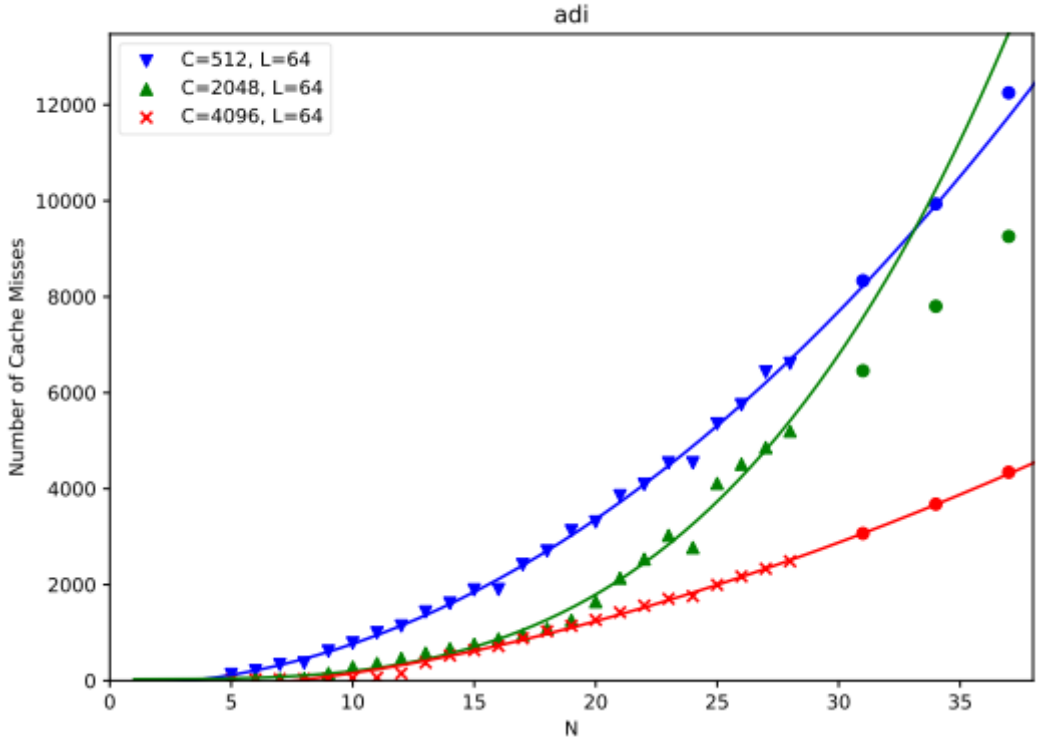


# VS Code overlay – average parallelism

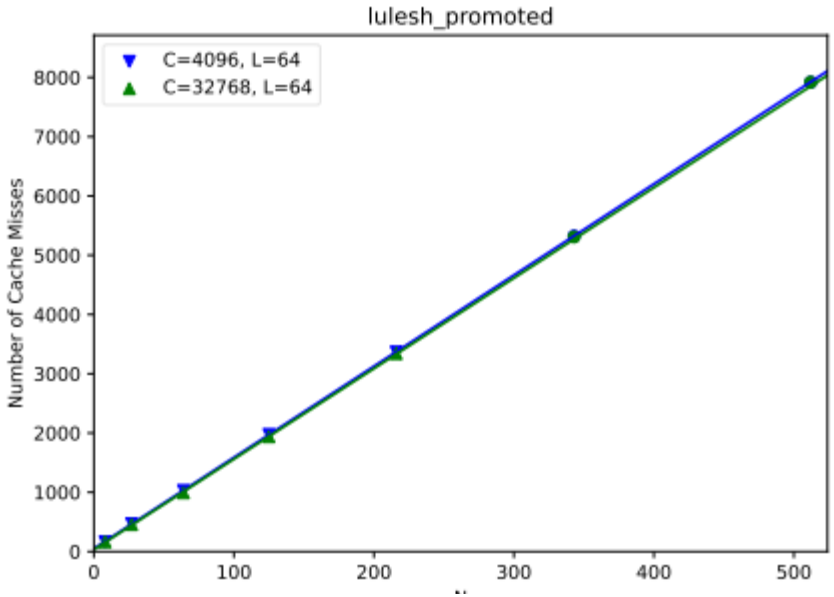


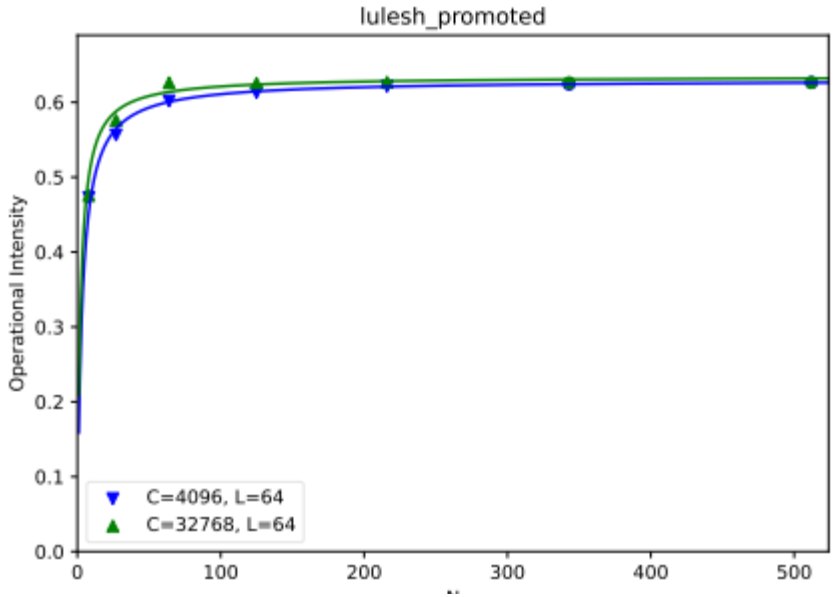
# VS Code overlay – operational intensity




adi
C=512, L=64
C=2048, L=64
C=4096, L=64
Number of Cache Misses
N
0
2000
4000
6000
8000
10000
12000
0
5
10
15
20
25
30
35

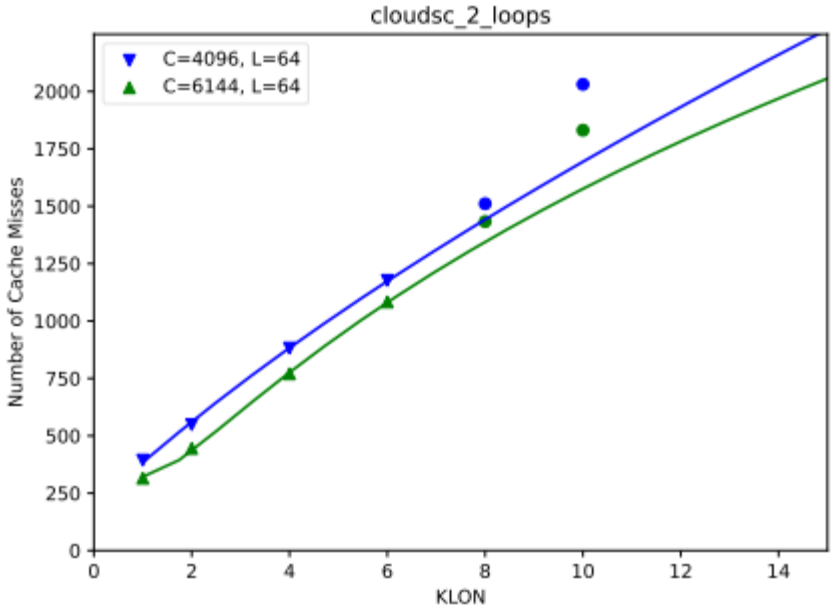
# LULESH Operational Intensity

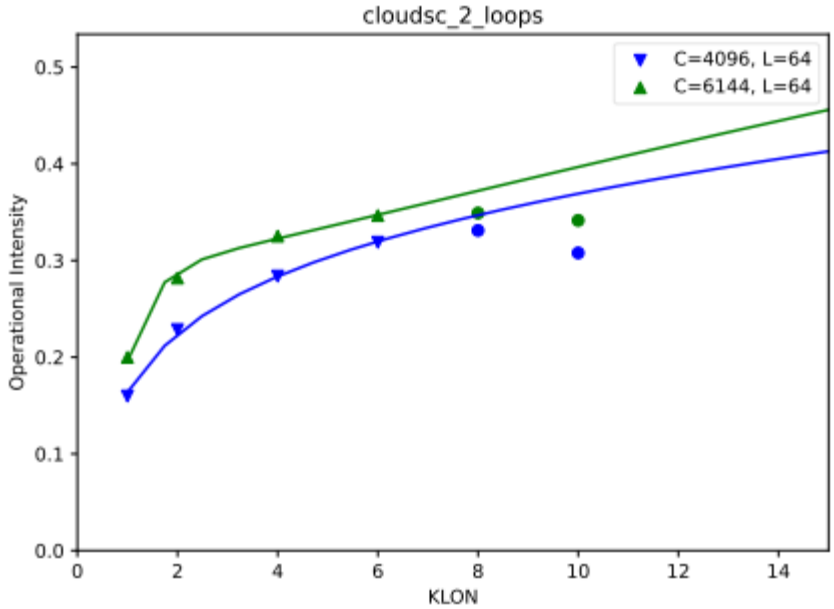



$$A_{LULESH} = \frac{620 \cdot N + 33}{70 \cdot N + 2} = \frac{W_{LULESH}}{D_{LULESH}} \approx 8.86$$

# CLOUDSC Operational Intensity




$$A_{CLOUDSC} = 93.25 \cdot KLON + 833.96$$