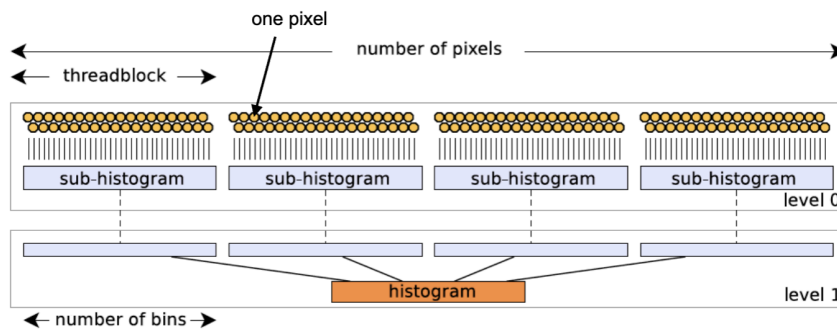
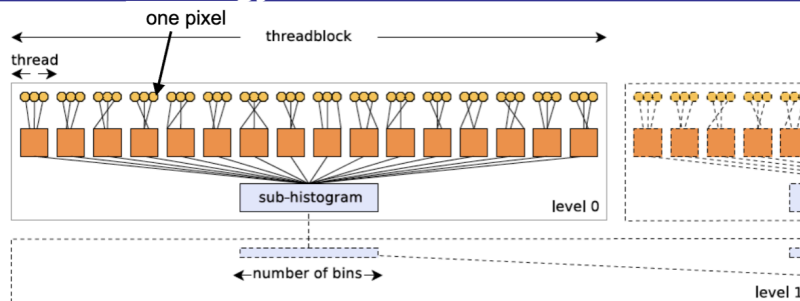


## Parallel Strategy #2



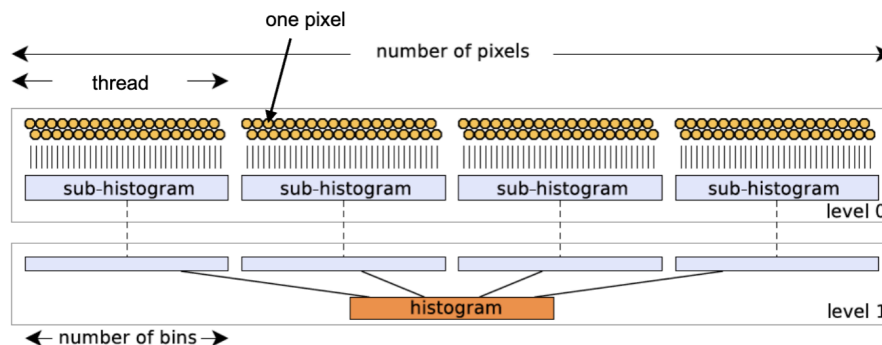
- Input array in global memory
- Histogram array in shared memory
- One histogram per threadblock; **all threads in block update it**
- One column per possible pixel value
- **Each block updates global histogram at the end**

## Parallel Strategy #3



- Input array tile in shared memory
  - Every thread reads entire tile
- Histogram array in shared memory
  - One histogram bin per possible pixel value
- One histogram per threadblock
  - Each thread responsible for a part of the sub-histogram (some bins)
    - Only increment bins that thread is responsible for
    - Conflicts? Only the bins that map to the same bank. Divergence?

## Parallel Strategy #1



- Input array in global memory
- Histogram array in shared memory
- One histogram per thread
- One column per possible pixel value

```

asa5078@robin:labs (ssh)
[asa5078@robin labs]$ ncu -o PS2_100_profile.ncu-rep --kernel-name "ParallelStrategyTwo" ./bin/linux/release/lab3
Timing 'ref_2dhisto' started
  GetTimeOfDay Time (for 100 iterations) = 1.548
  Clock Time      (for 100 iterations) = 1.54662
Timing 'ref_2dhisto' ended
==PROF== Connected to process 1523996 (/home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/bin/linux/release/lab3)
device input size is 67108864
Timing 'opt_2dhisto' started
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
  
```

```

==PROF== Profiling Baseline : 0%...50%...100% - 9 passes
==PROF== Profiling "Baseline": 0%...50%...100% - 9 passes
==PROF== Profiling "Baseline": 0%...50%...100% - 9 passes
==PROF== Profiling "Baseline": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 100 iterations) = 78.286
      Clock Time       (for 100 iterations) = 77.2818
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1518385
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/BASELINE_100_profile.ncu-rep
[asa5078@robin labs]$

```

```

==PROF== Profiling ParallelStrategyOne : 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyOne": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyOne": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyOne": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 10 iterations) = 633.159
      Clock Time       (for 10 iterations) = 632.563
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1521178
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/PS1_100_profile.ncu-rep
[asa5078@robin labs]$

```

```

==PROF== Profiling ParallelStrategyTwo : 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyTwo": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 100 iterations) = 85.22
      Clock Time       (for 100 iterations) = 84.3047
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1523996
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/PS2_100_profile.ncu-rep
[asa5078@robin labs]$

```

```

==PROF== Profiling ParallelStrategyThree : 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyThree": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyThree": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyThree": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 100 iterations) = 77.973
      Clock Time       (for 100 iterations) = 77.0366
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1527138
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/PS3_100_profile.ncu-rep
[asa5078@robin labs]$

```

```
==PROF== Profiling ParallelStrategyFour : 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFour": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFour": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFour": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 100 iterations) = 78.246
      Clock Time      (for 100 iterations) = 77.1527
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1530012
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/PS4_100_profile.ncu-rep
[asa5078@robin labs]$
```

```
==PROF== Profiling ParallelStrategyFive : 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFive": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFive": 0%...50%...100% - 9 passes
==PROF== Profiling "ParallelStrategyFive": 0%...50%...100% - 9 passes
      GetTimeOfDay Time (for 100 iterations) = 78.304
      Clock Time      (for 100 iterations) = 77.3067
      Timing 'opt_2dhisto' ended

      Test PASSED
==PROF== Disconnected from process 1532407
==PROF== Report: /home/asa5078/368/final_lab3/CE468-CUDA-Labs/labs/PS5_100_profile.ncu-rep
[asa5078@robin labs]$
```