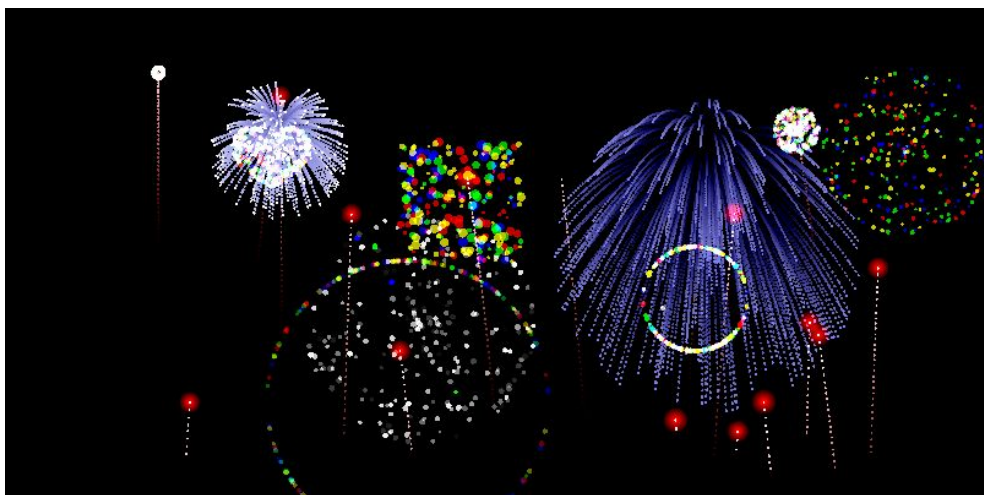
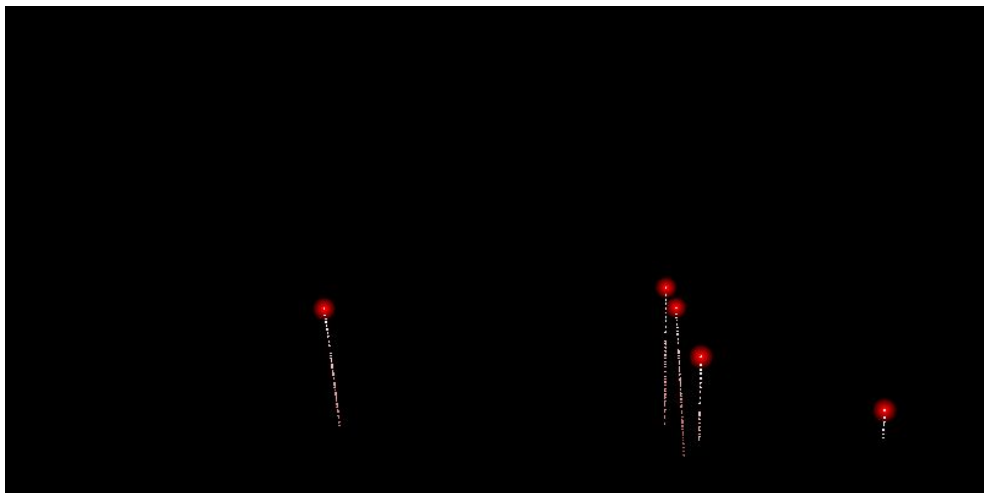


Fireworks

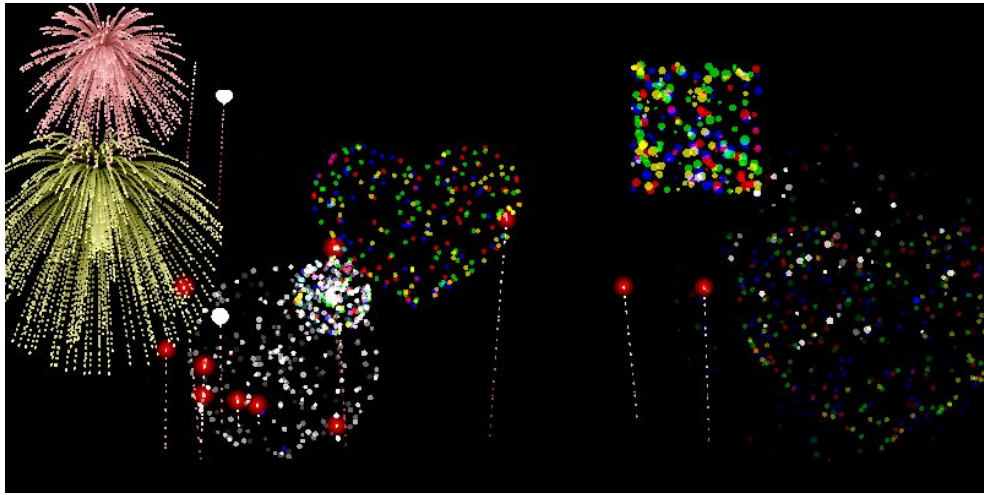
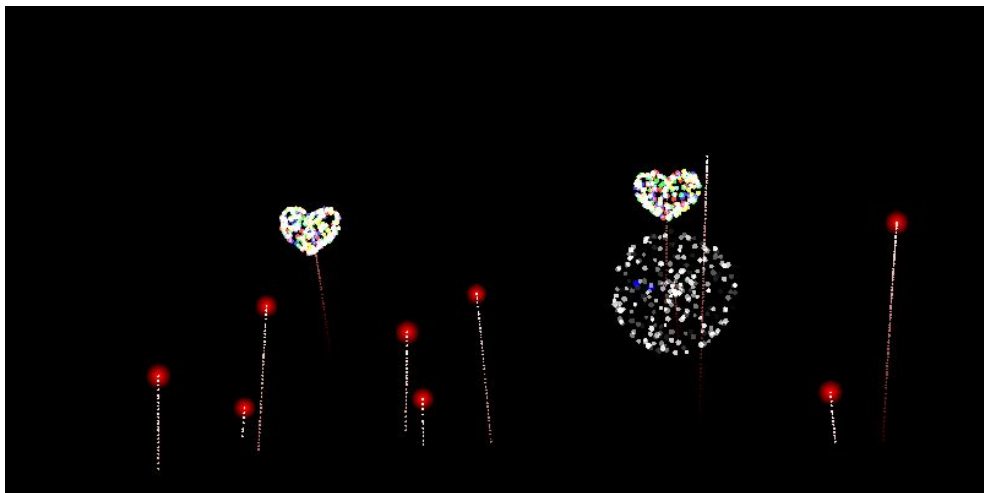
A fast and realistic fireworks
renderer in CUDA



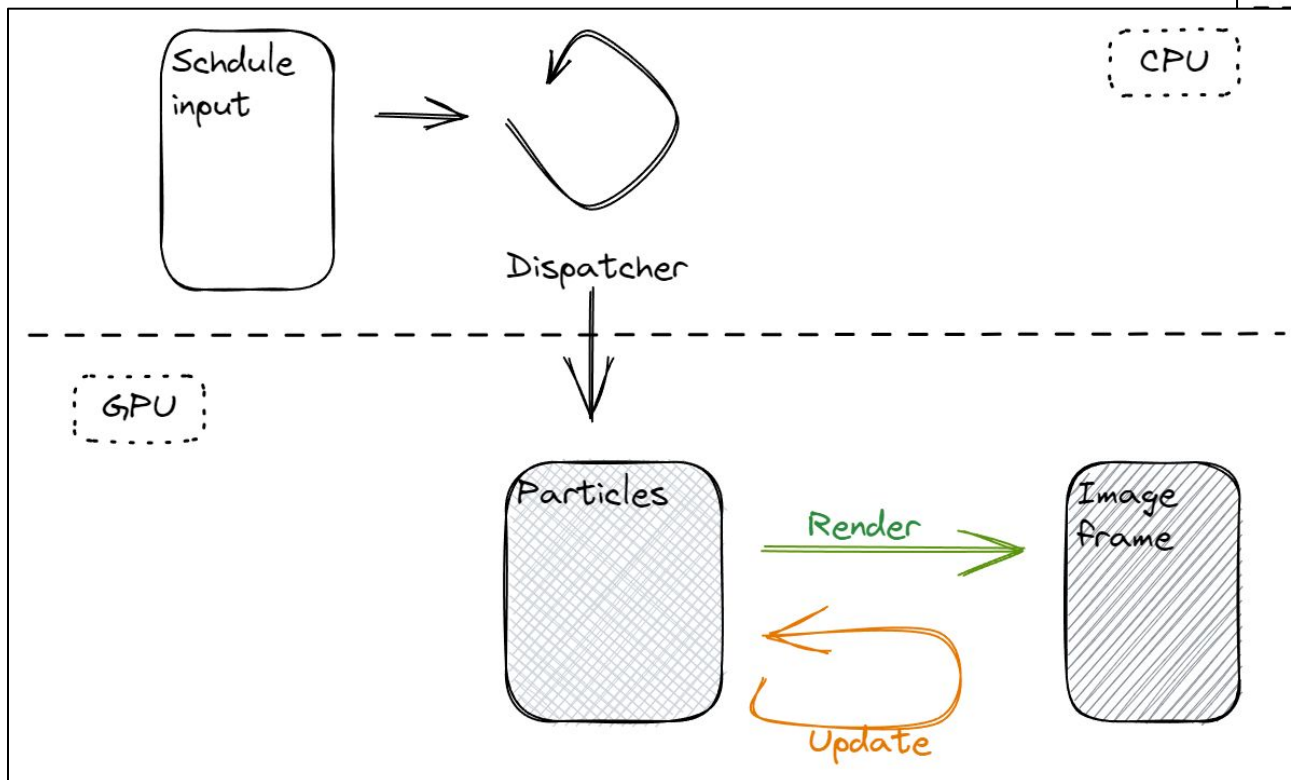
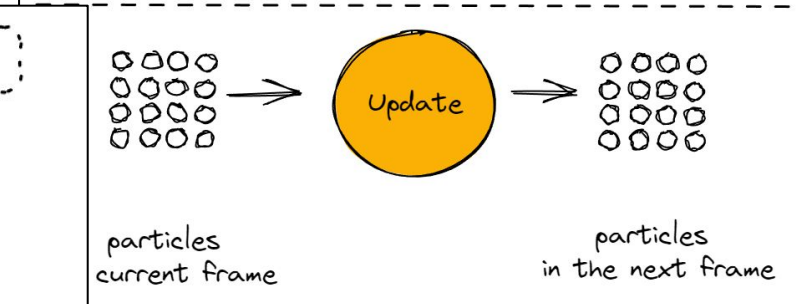
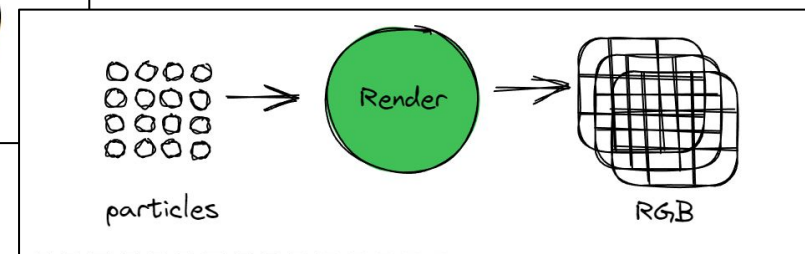
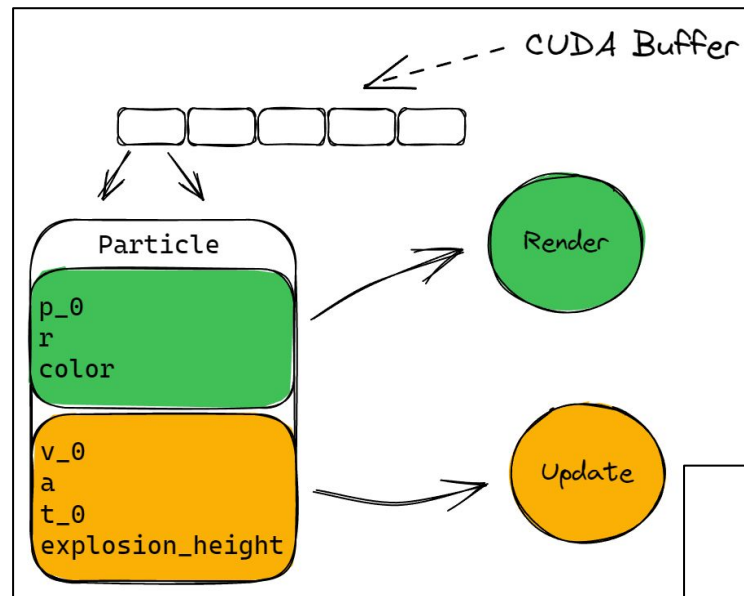
Jiyu Hu (jiyuh)
Zhaohong Lyu (zhaohonl)



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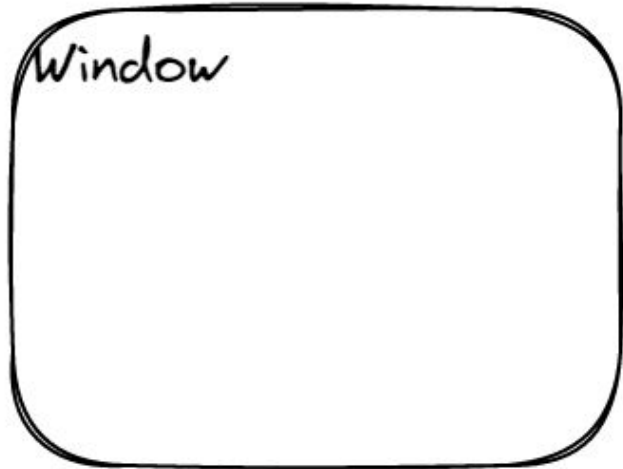


Workflow

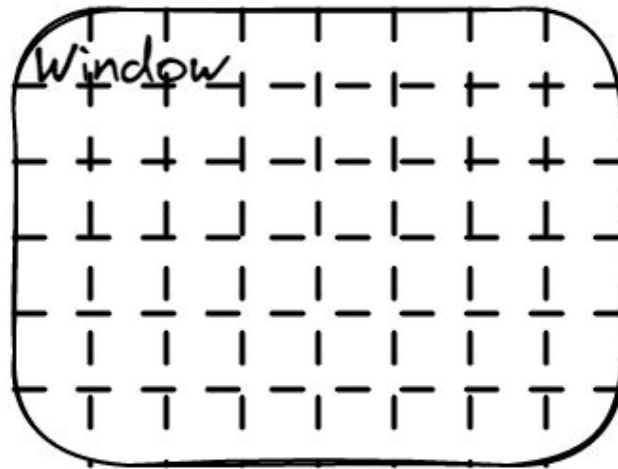


Optimization trick #1

Before



After



1. Scan in parallel
2. Render in parallel
3. Reduction in parallel

Optimization trick #2

Before

Real-world timeline



+fix_t

+fix_t

After

Real-world timeline



+delta_rt

+delta_rt

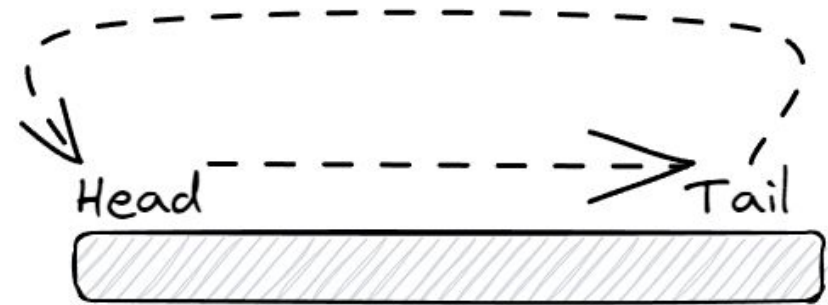
Optimization trick #3

Before



1. Compute list len based on input schedule.
2. Unbounded memory usage.
3. No GC.

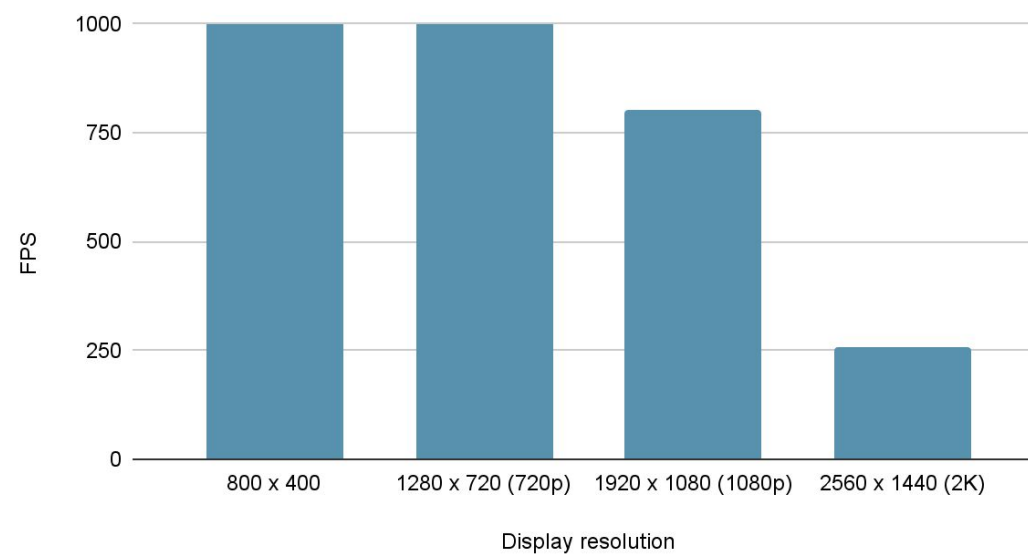
After



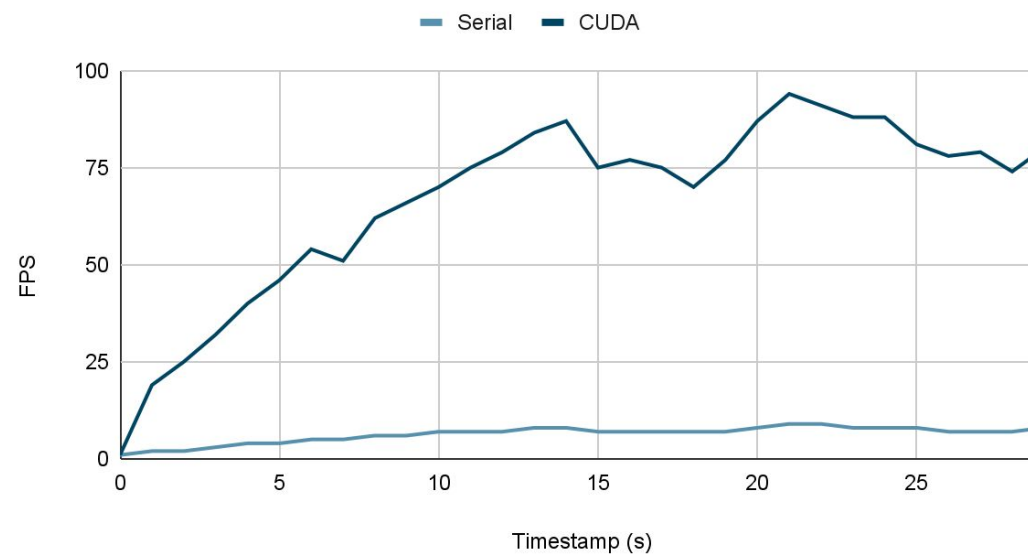
1. Fixed list len.
2. Bounded memory usage.
3. With evicted particles cleanup.

Benchmark

Impact of display resolution vs FPS

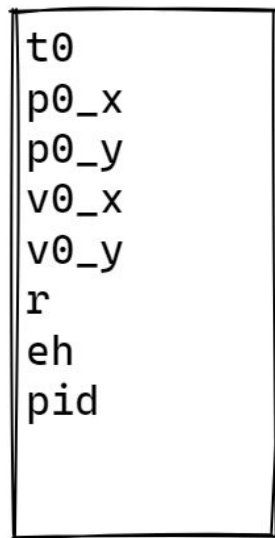


FPS between serial and parallel

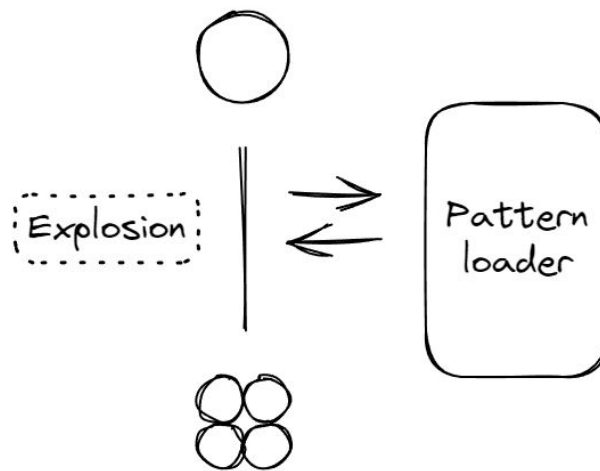


Extensibility and flexibility

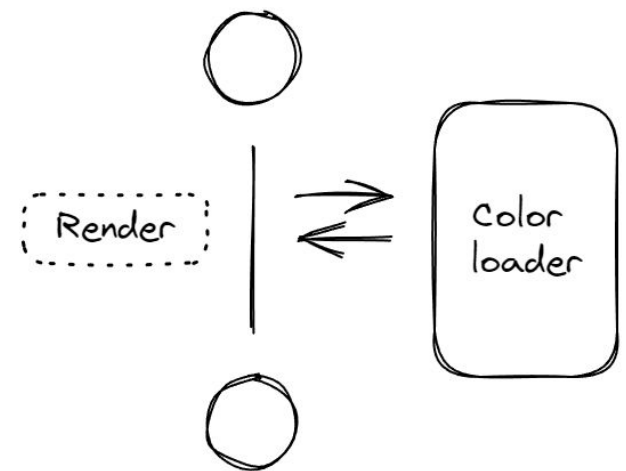
Design your own fireworks show!



Custom fireworks schedule



Custom pattern



Custom color