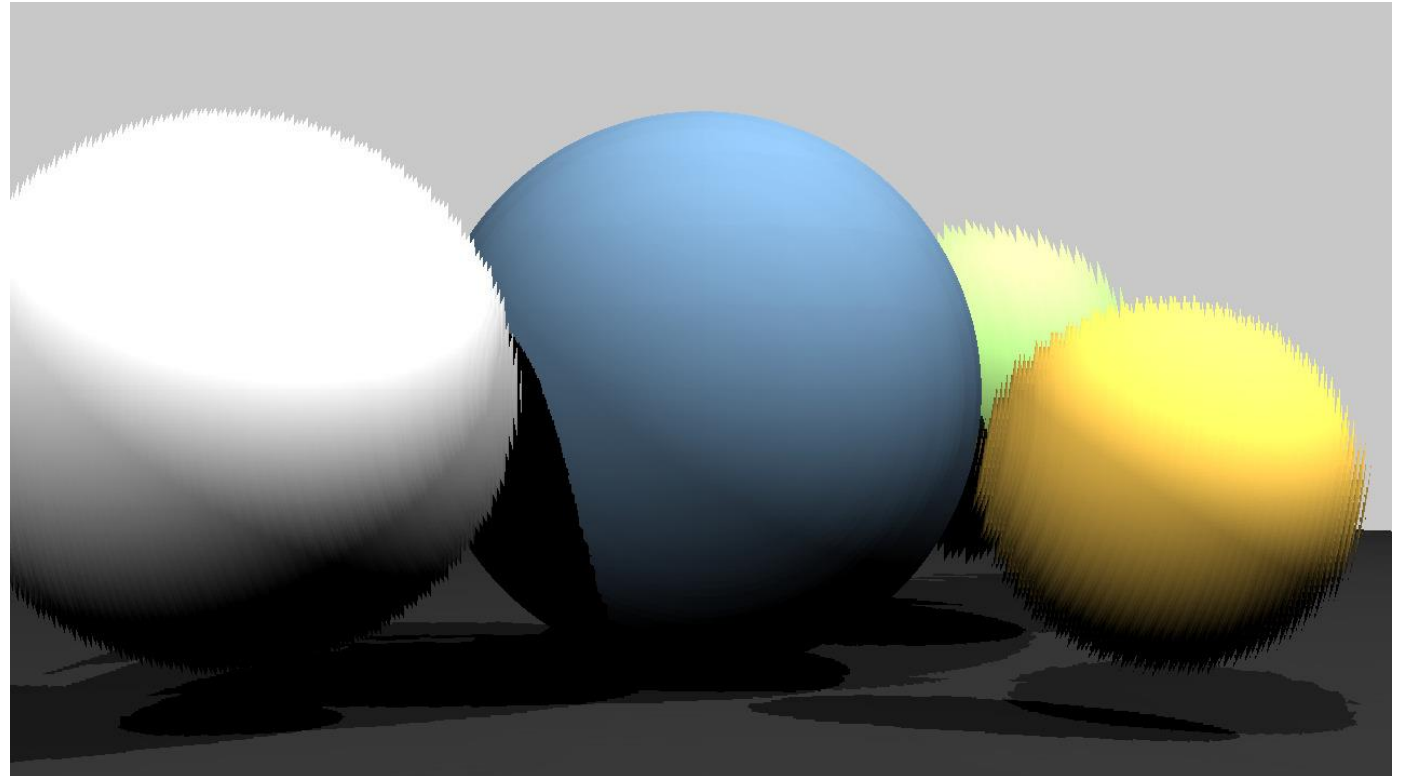# MemPool meets Systolic

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# Ray Tracing

- Implemented in C

- Parallelized with OpenMP

- Quantized for integers
  - Not perfect yet
  - No reflections yet
  - Good enough as proof of concept

- Single core execution: 191520

- Static schedule: 222264 (206611)
  - **86%** of ideal speedup

- Dynamic schedule: 210889 (207286)
  - **91%** of ideal speedup

# Histogram Equalization

- Implemented in Halide

- Three key phases
  - Compute histogram
  - Compute transformation function
  - Transform image

- Parallelizing the first stage is extremely tricky
  - Specialized papers about parallel reductions
  - Our Halide runtime seems off

- Full application not working correctly currently

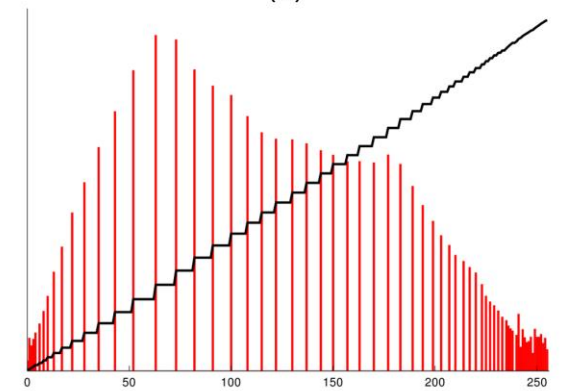- Only parallelizing the last stage gives very poor results



(a)

(b)
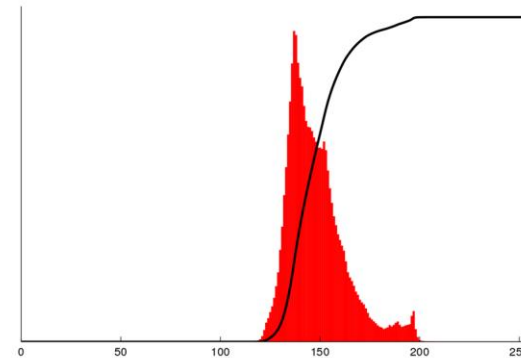
(c)

(d)

https://commons.wikimedia.org/wiki/File:Histogram_equalization.png