CUDA simple object detector

GPGPU

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Introduction

This presentation is about how to go from .34 Frames per second to 17 frames per second with an object detection program

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This improvement represents 42X improvement

Grayscale

Figure: Gray scaled image.

Grayscale

Implementation	**Frame-rate (in frames/second)**
CPU	198.2
naive GPU	4.14K
GPU	/

Table: Grayscale Benchmarks

Gaussian Blur

Figure: Blurred image.

Gaussian Blur

Implementation	**Frame-rate (in frames/second)**
CPU	15.23
naive GPU	359.35
GPU	/

Table: Gaussian Blur Benchmarks

Closing

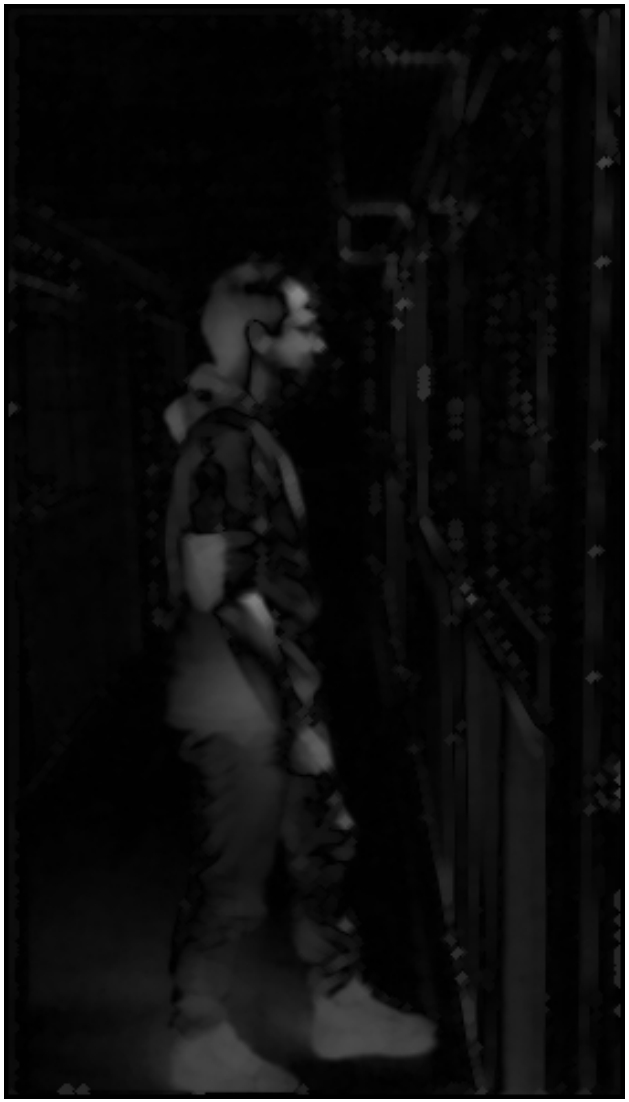

Figure: Closing image.

Opening

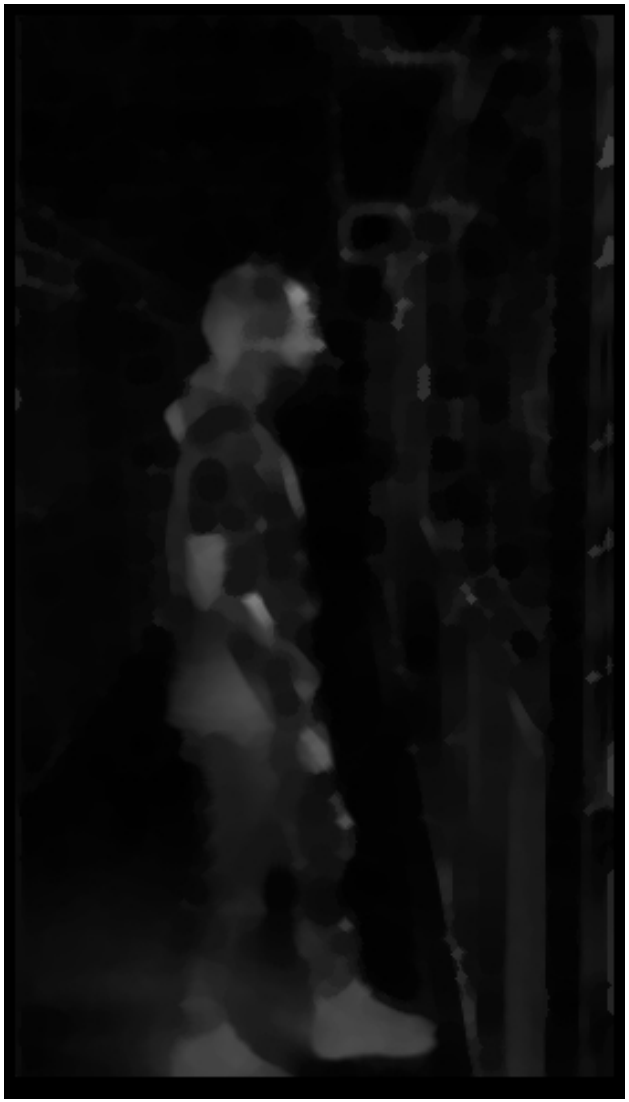

Figure: Opening image.

Closing & Opening

Implementation	**Frame-rate (in frames/second)**
Closing CPU	10.38
Opening CPU	2.15
Closing naive GPU	1.20K
Opening naive GPU	328.00
Closing GPU	/
Opening GPU	/

Table: Morphological Closing & Opening Benchmarks

Thresholds

Figure: 2nd Threshold image.

Thresholds

Implementation	**Frame-rate (in frames/second)**
CPU	0.45
naive GPU	1.32
GPU	7.58 (48.6)

Table: Thresholds & Connected Components Benchmarks

Connected Components

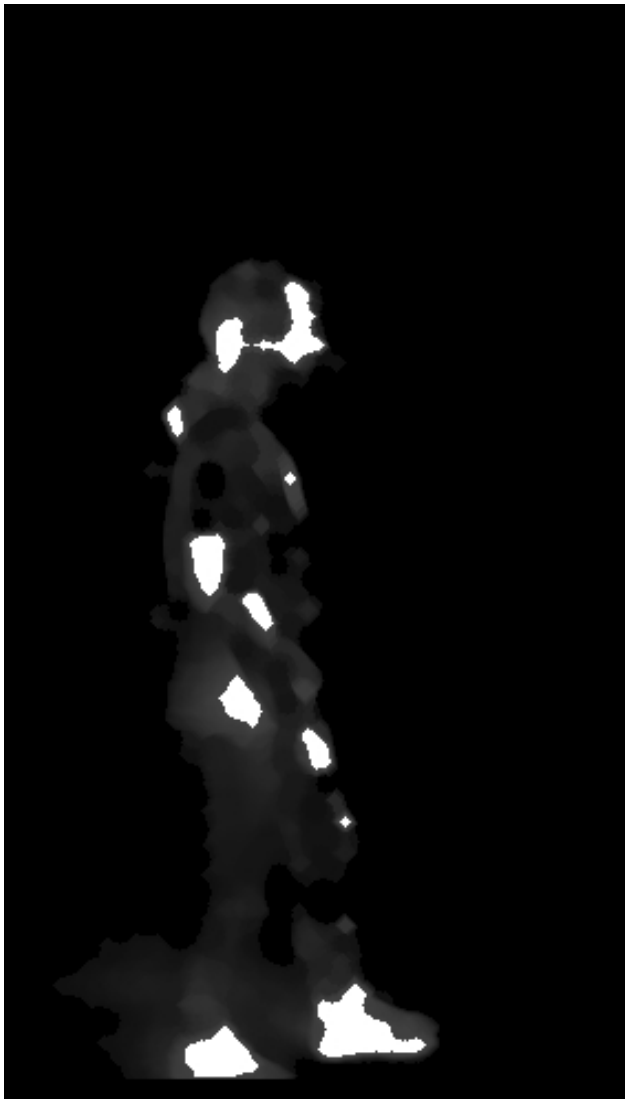

Figure: Connected Components Explanation image.

Connected Components

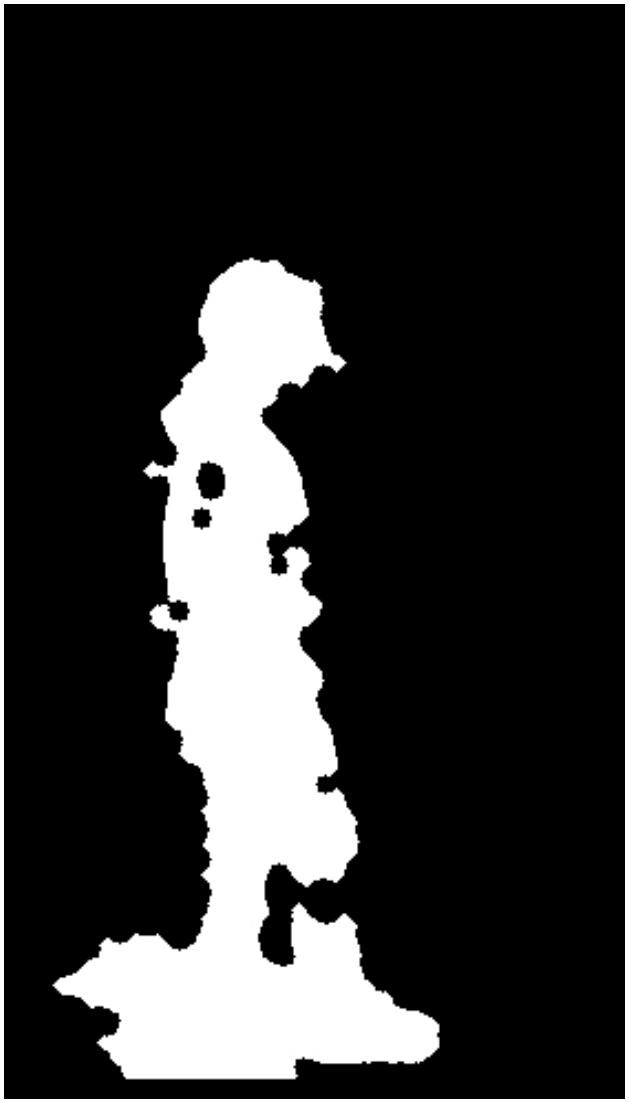

Figure: Connected Components image.

Connected Components

Implementation	**Frame-rate (in frames/second)**
CPU	0.45
naive GPU	1.32
GPU	7.58 (17.9)

Table: Thresholds & Connected Components Benchmarks

Conclusion

Implementation	**Frame-rate (in frames/second)**
CPU	0.34
naive GPU	1.38
GPU	17.29

Table: Final program Benchmarks

Conclusion

Thank you for your attention !