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# bfs experiment progress

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# 1 bfs optimizations

In order to accelerate bfs on FPGAs using OpenCL, we reorganize the bfs algorithm to a stream manner such that it can fit well with the hardware optimization.

Using the youtube dataset, a straightforward bfs takes 40s while a basic stream bfs takes 3.8s.

Since memory bandwidth is the bottleneck of the bfs performance, we developed a number of strategetic optimizations to the bfs accelerator to reduce the memory accesss and improve the memory bandwidth utilization.

Optimization Strategies	Optimizaed Runtime	Baseline Runtime
top-down	3.8s	3.8s
wide data width	bug	3.8s
customized data path	?	3.8s
duplicate data path	?	3.8s
cache hub vertex	3.4s	3.8s
hw-sw codesign	2.8s	3.8s
codesign + bottom up	2.2s	3.8s
codesign + bottom up + pipeline	1.6s	3.8s
codesign + top down + pipeline	1.2s (bug)	3.8s