Gunrock: A High-Performance Graph Processing Library on the GPU
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Overview
Gunrock is a stable, powerful, forward-looking, open-source substrate for GPU-based graph-centric research and development. Gunrock offers:
- the best performance on GPU graph analytics;
- a high-level abstraction for graph algorithms on the GPU; and
- the widest range of primitives.

What is Gunrock’s Data-centric Programming Model?
A frontier is a compact queue of nodes or edges. Gunrock’s three operators (below) manipulate frontiers.
- advance: generate a new frontier from the edges or vertices of the current frontier
- filter: generate a new frontier from a current frontier using a user-specified predicate
- compute: run a user-specified computation in parallel on each element in the current frontier

How does Gunrock express graph algorithms?

Why is Gunrock fast?
Powerful load-balancing capabilities that effectively address the inherent irregularity in graphs:
- Scale to multiple GPUs/nodes;
- Asynchronous model;
- Out-of-core and streaming support;
- Expand core operators and new primitives;
- In-depth performance characterization.

Future Work
- Expand core operators and new primitives;
- In-depth performance characterization.

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