GPU Device Code for 2-level Parallelism

Gather:

Gather_map:

    parfor each in_edge_array e

   update to edge_update_array using gatherMap(vertex_array[$e.src$])

deviceSynchronizeBarrier()

Gather_reduce:

    parfor each vertex v in the interval:

   update vertex_update_array list using

          gatherReduce(edge_update_array, UserGatherReduce)

Apply:

    parfor each vertex v in the interval:

    update vertex state of v using apply(vertex_update_array[v.val])

    if($v.val$ updated)

        v.active = true

Scatter:

    parfor each out_edge_array e in the shard:

    update edge state of e using scatter(e)

FrontierActivate:

    parfor each out_edge_array e in the shard:

    if($e.src.active$ = true)

        activity_list = activity_list U {$e.dst$}