Objective
Degree distribution in real-world graphs is irregular and follows power-law distribution.

- The cost of processing high-degree vertices greatly exceeds the cost of processing low-degree vertices.
- This is observed in both computation and communication costs.

**Insight**
- All incoming edges for each low-in-degree vertex are local to the machine on which the vertex resides.
- For balancing the computation, the incoming edges for each high-in-degree vertex are distributed across multiple machines.

**DP: Differential Processing**
- Treats low- and high-degree vertices differently during each iteration in three steps.

1. low-degree vertices are processed multiple times as long as their values keep changing.
2. Multiple updates of low-degree vertices scatter latest values to high-degree vertices.
3. In the end, High-degree vertices are processed exactly once deploying all the changes.

**Turn off/on DP**
- High number of low-degree vertices are active for participation in DP in order to deliver more changes to the high-degree vertices.
- The number of active high-degree vertices also need to be high enough to receive as many changes as possible.

**Delta Propagation**
- Every vertex caches the gathered data when it is processed the first time and maintains this cached data for the rest of the execution.
- Caches are kept updated during the scatter.
- No need to collect the data from unchanged edges during the gather phase.

**Execution Time (s)**
- Baseline and our approach compared across different datasets and query types.