A Demonstration of Transactional Panorama: A Framework for Presenting Visual Results in Visual Interfaces

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EPIC DATA lab

How to present visual results under updates with specified properties and performance preserved?

MVC Properties

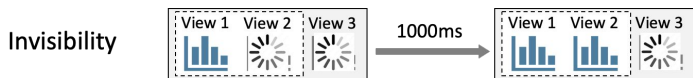**Monotonicity** – Never travel back in time for seeing visualization results

Visibility – Always see a result for all visualizations

Coherence – Results derived from the same version of source data
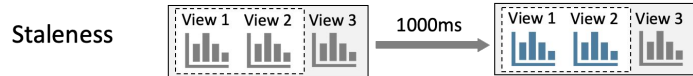
Performance Metrics

Invisible – User cannot interact with the visualization while under computation

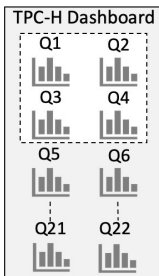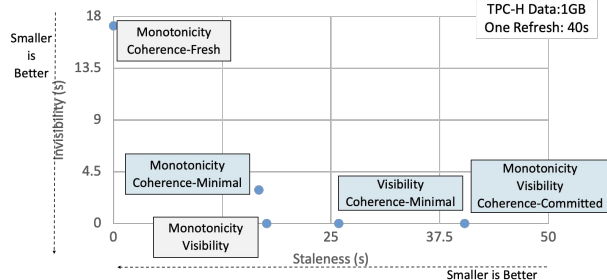**Stale** – A visualization does not belong to the latest version of the query results

Invisibility

Invisibility = 1000ms/2 = 500ms

Staleness

Old Results — Staleness = 2000ms/2 = 1000ms

Performance Tradeoffs

TPC-H Data:1GB
One Refresh: 40s
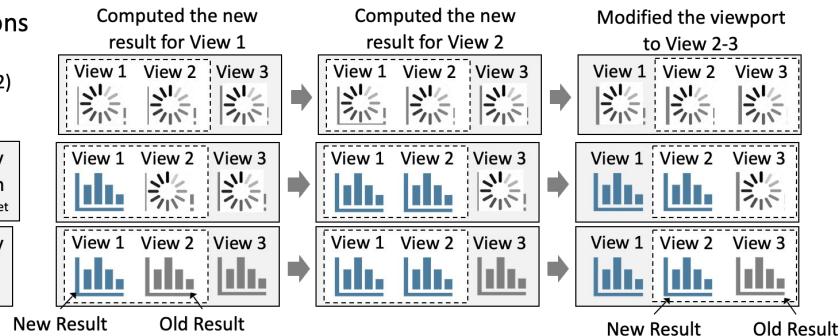
TPC-H Dashboard

Existing MVC Property Combinations

Existing Options

Dominated by (2)
Used in Excel, Tableau

(2) Monotonicity
Coherence-Fresh
Used in Power BI, Superset

(3) Monotonicity
Visibility
Used in Google Sheets

| Computed the new result for View 1 | Computed the new result for View 2 | Modified the viewport to View 2-3 |

New Result — Old Result — New Result — Old Result

New MVC Property Combinations

New Options

Monotonicity
Visibility
Coherence-Committed

Monotonicity
Coherence-Minimal

Visibility
Coherence-Minimal

| Computed the new result for View 1 | Computed the new result for View 2 | Modified the viewport to View 2-3 |

Sacrifice Visibility

Sacrifice Monotonicity