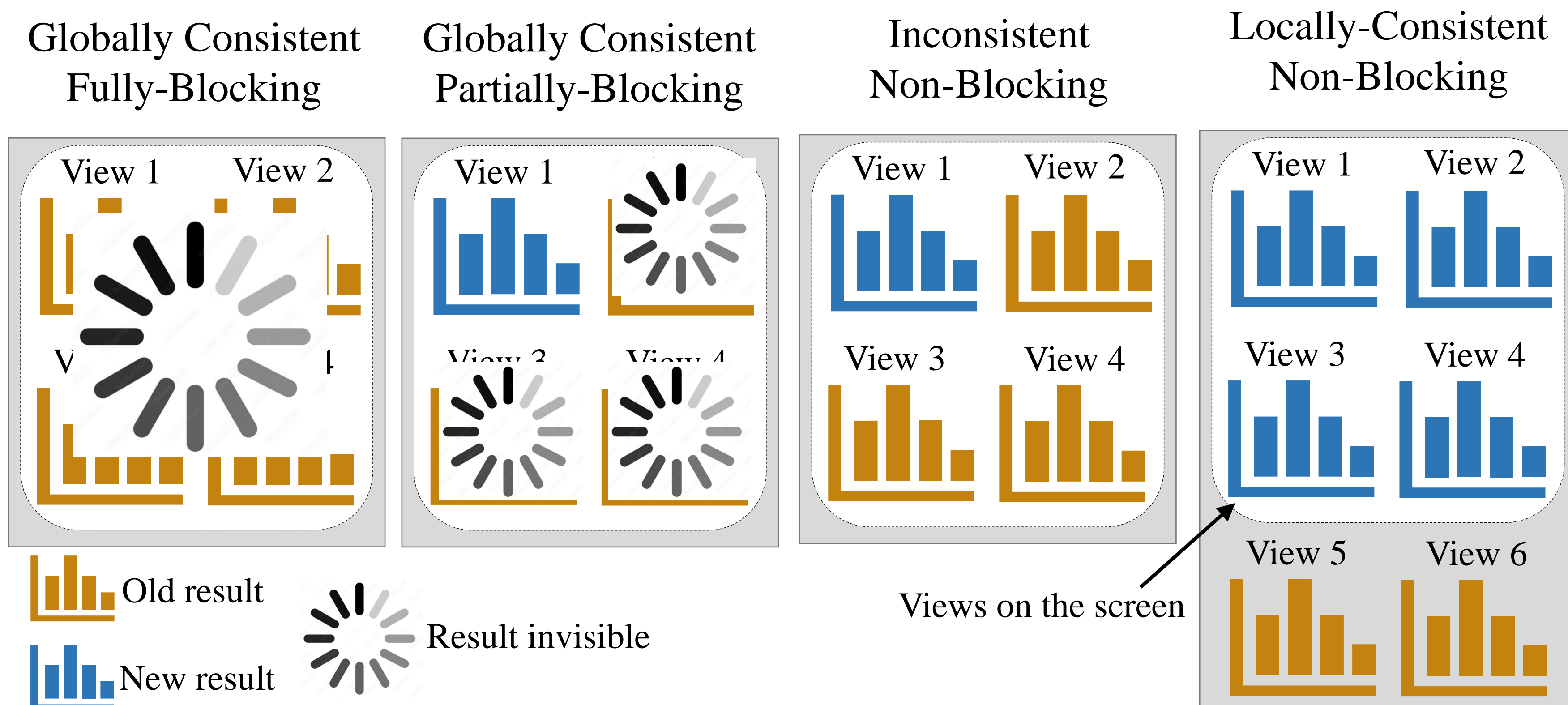


Transactional Panorama: A Conceptual Framework for User Perception in Analytical Visual Interfaces

Dixin Tang (totemtang@berkeley.edu), Alan Fekete, Indranil Gupta, Aditya G. Parameswaran

While refreshing visualizations in a visual interface, how to allow users to **continuously explore results**, while ensuring that **the results are not confusing or stale**?

Fixed Trade-Offs by Existing Tools



Lens name	Example Tools	Monotonicity	Visibility	Consistency
Globally-Consistent Fully-Blocking (GCFB)	MS Excel Libre Calc Tableau	Yes	No	Yes
Globally-Consistent Partially-Blocking (GCPB)	Power BI Superset Dataspread	Yes	No	Yes
Inconsistently Non-Blocking (ICNB)	Google Sheets	Yes	Yes	No

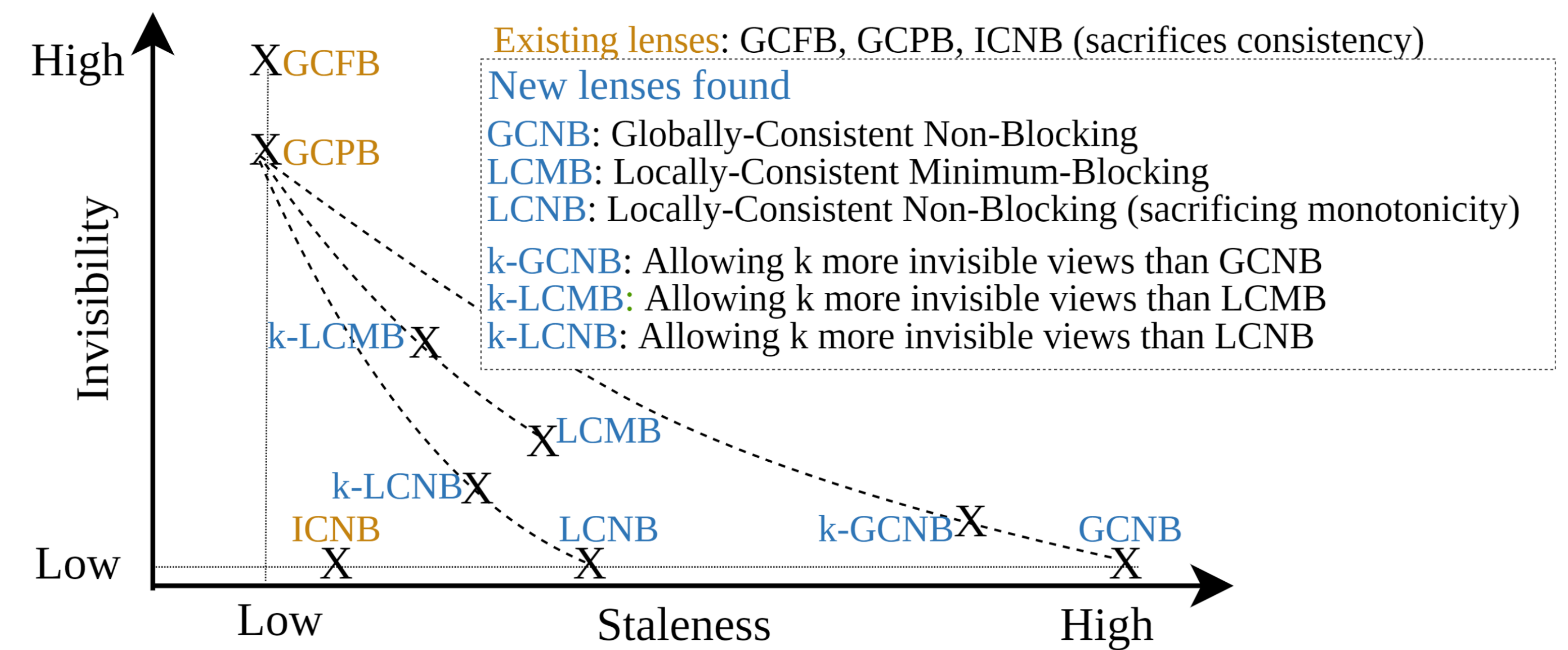
MVC Properties

Monotonicity – Never travel back in time for seeing visualization results

Visibility – Always see a result for all visualizations

Consistency – Results derived from the same version of source data

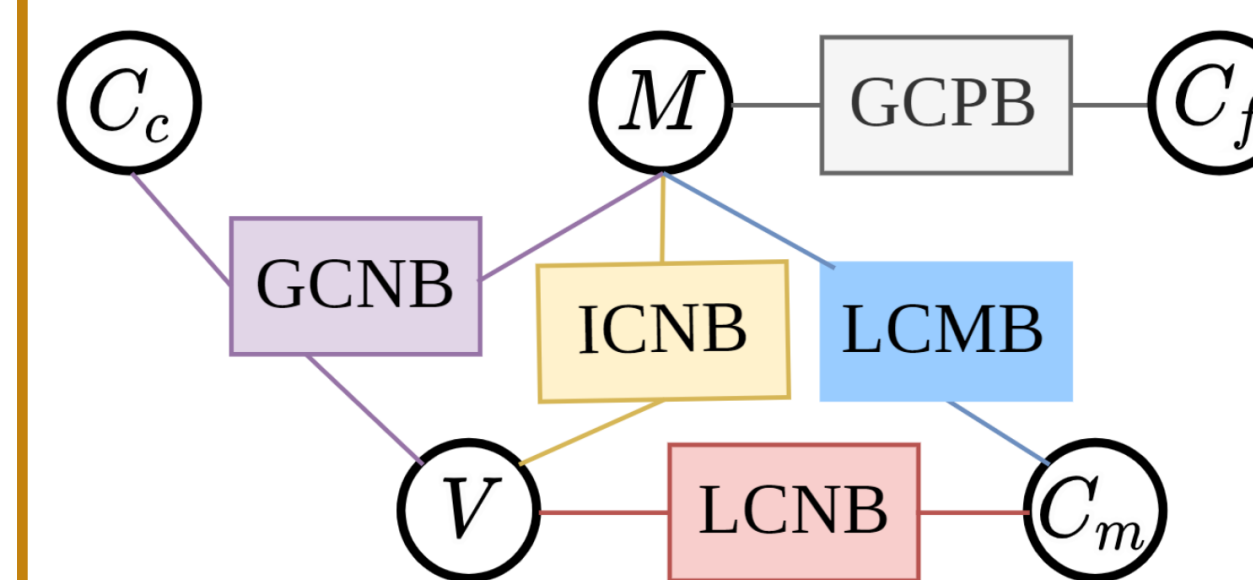
Transactional Panorama: Exploring Visual Results with Properties Guaranteed through Transactions



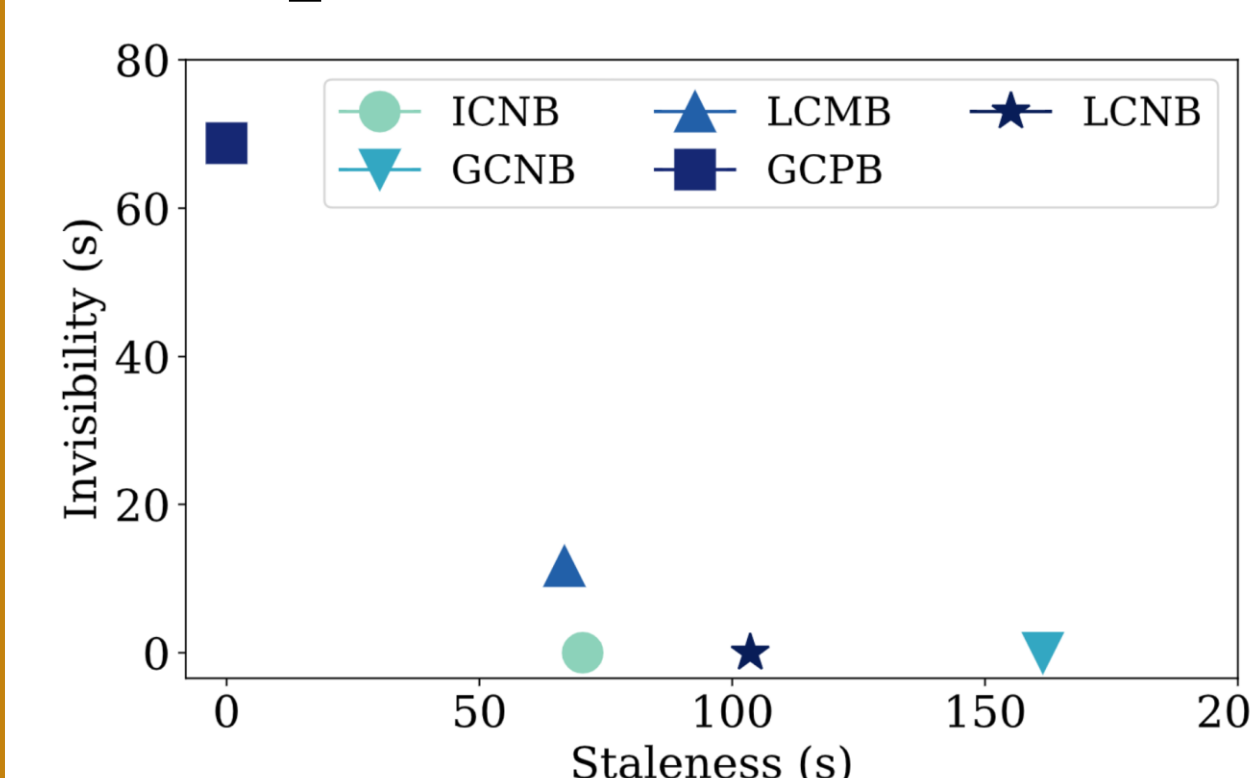
Staleness – The total time when the user reads stale results

Invisibility – The total time when the views read by a user are invisible

Possible Property Combinations



Experiment Results



Choosing the Right Lens

