

Declarative Visualization Interaction Language

A DeVIL-ish Approach

to Inconsistency in

Interactive Visualizations

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disorder
disorder

disorder
disorder

consistent
reorderings

sync



disorder

disorder

disorder

disorder

disorder

disorder

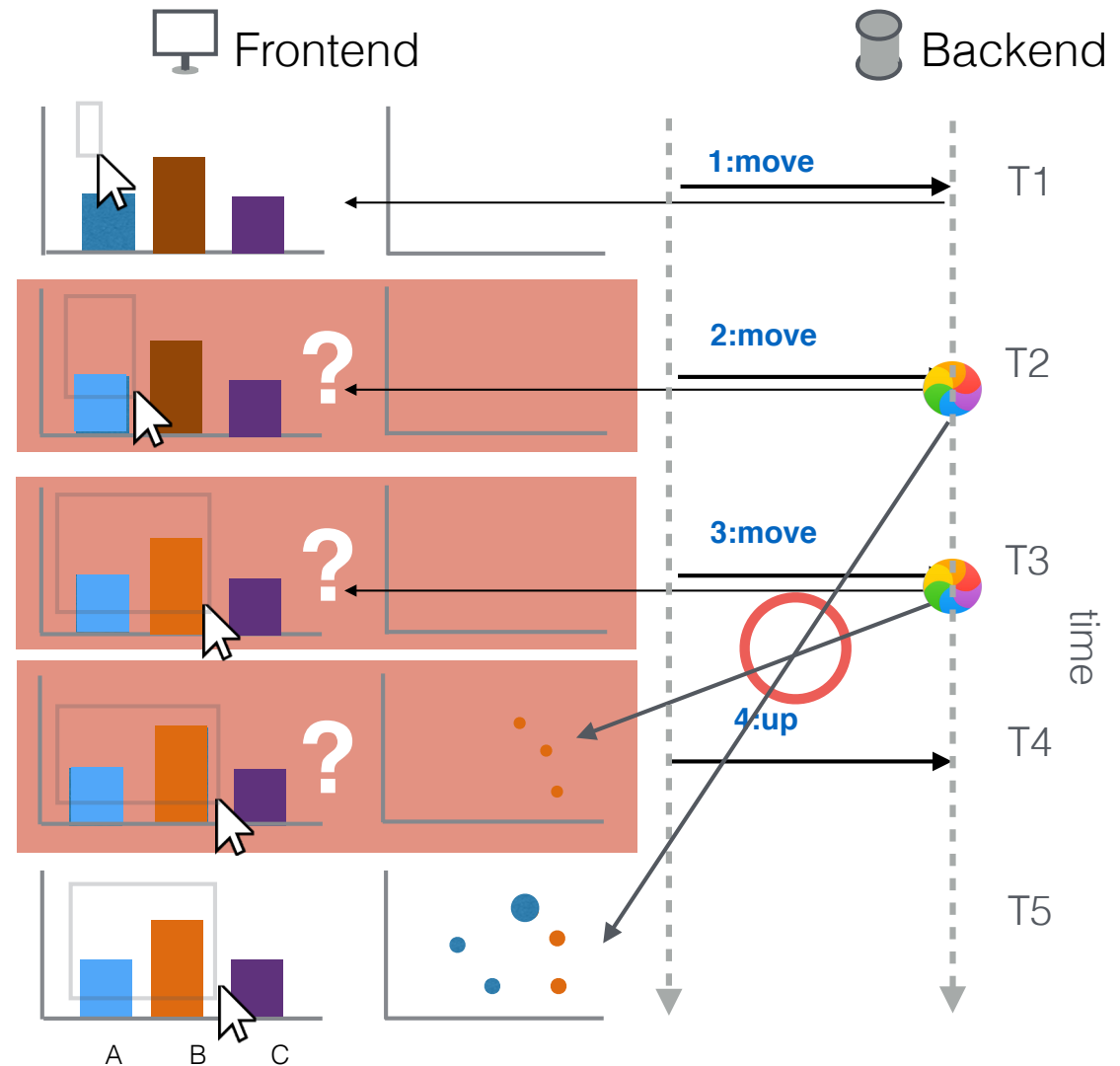
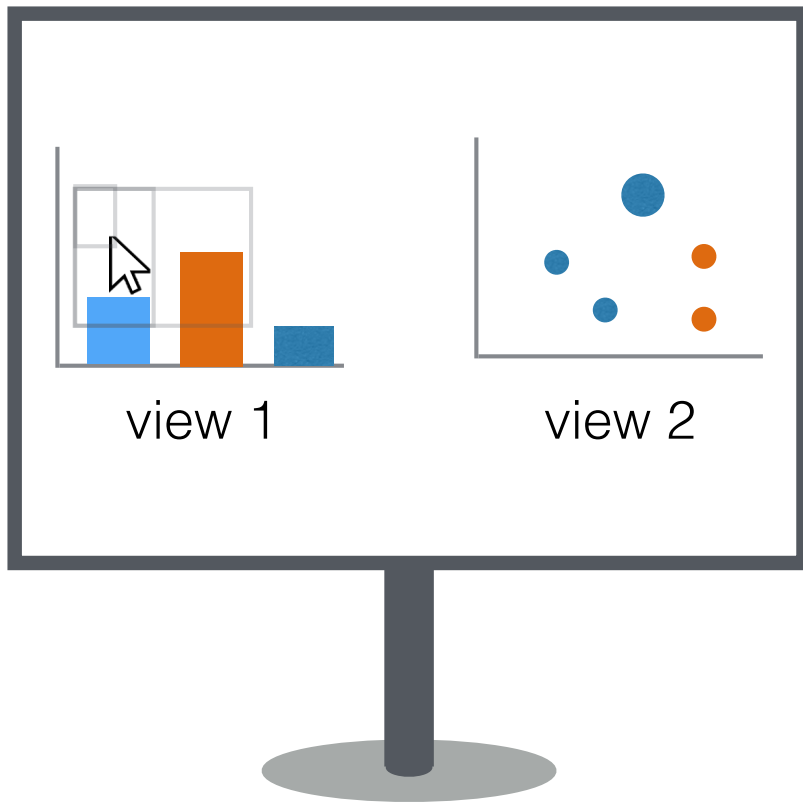
disorder

disorder

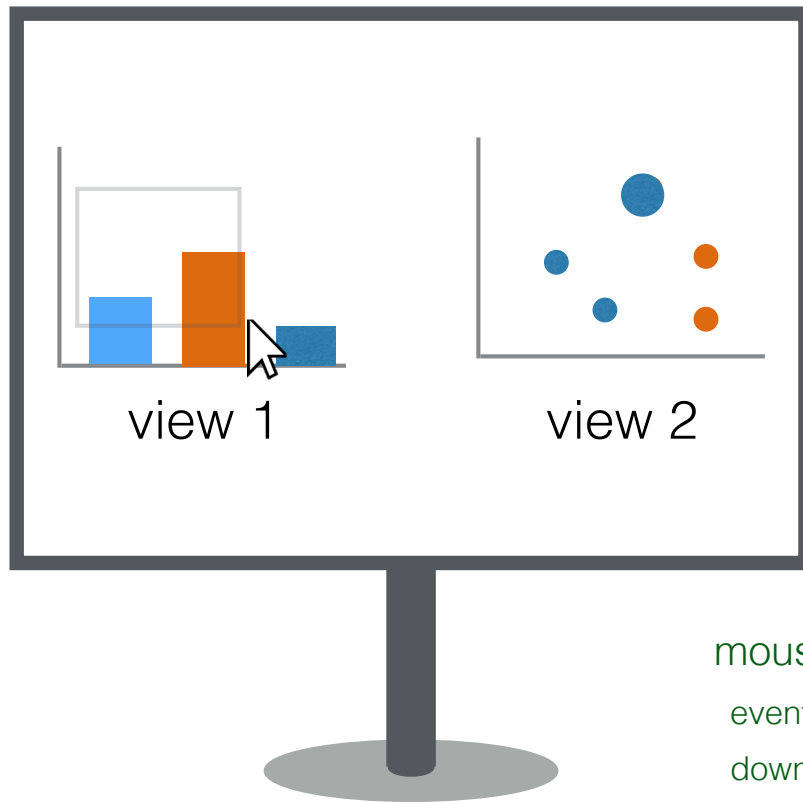
disorder

Partial Evaluation With Nondeterministic Delays

Highlighting and Details on Demand



Relational Model for Interactive Visualization



view 2

cx	cy	r	color
160	90	5	orange
130	140	2	blue

view 1

view 2

mouse event stream

event	x	y
down	50	95
up	50	95



view1_recs @ vn-1

x	y	width	height	color
50	150	5	20	blue
60	150	5	30	blue
90	150	5	60	blue

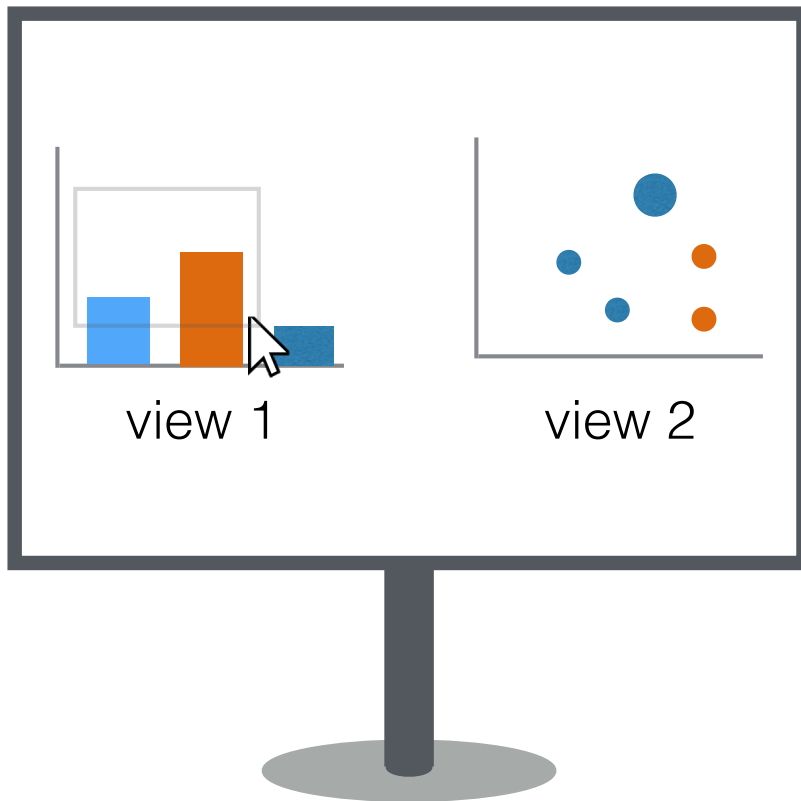
base data

city	stores	sales	reps
SF	50	800	5
NYC	30	300	2
LA	5	100	1
BOS	1	50	1

#1: Database Conflict Detection

X bad reorderings ✓ good reordering

might be too strict



pixel data

x	y	color	lineage
...	...	blue	I1, V1, T1
70	140	orange	I1, V2, T2
...
80	140	orange	I1, V2, T2
...
90	140	white	init
...

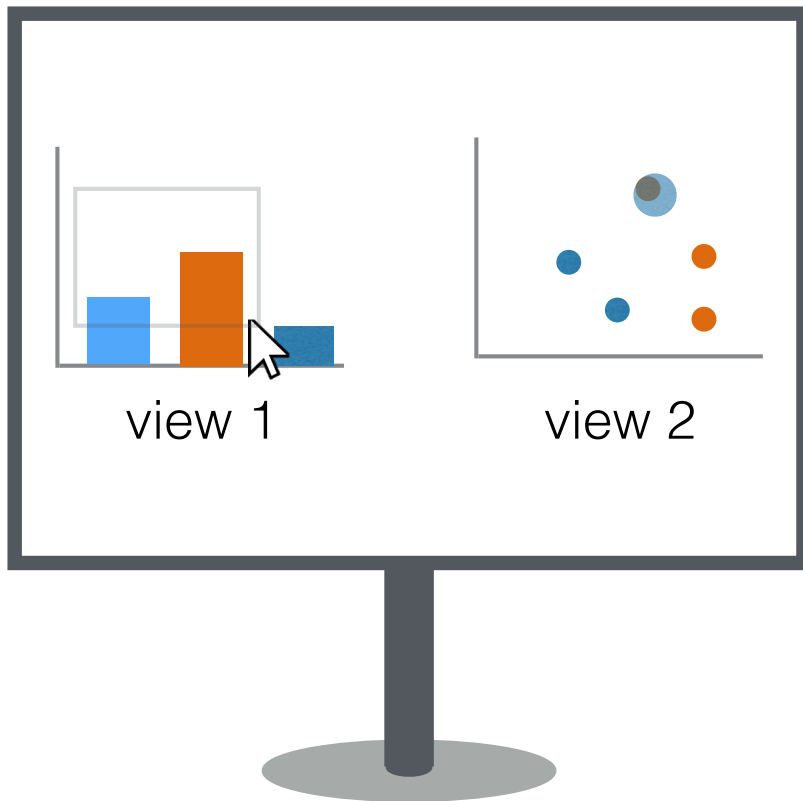


current_interaction: I1, I2

#2 Merge Functions

commutative: $f(x,y) = f(y,x)$

might not cover all semantics



pixel data

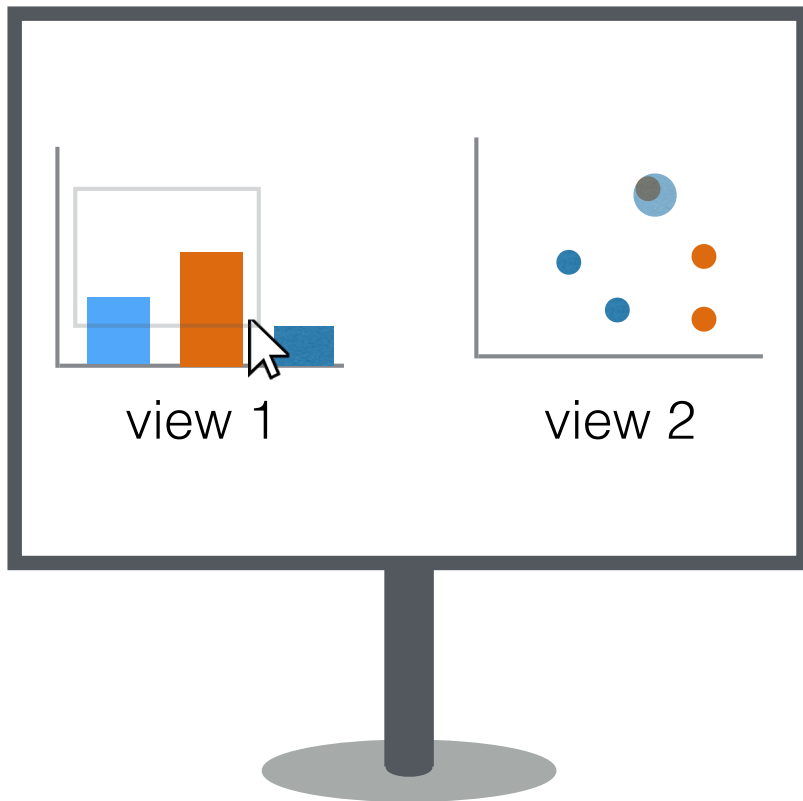
x	y	color	lineage
...
70	140	blue	I1, V1, T1 I1, V2, T2
...
80	140	orange	I1, V2, T2
...
90	140	white	init
...

```
merge_func(p1, p2) :  
  [p1, p2].map(p ->  
    p.lineage.mark.transparency = 0.5)
```

#3 Interaction Constraints

similar to database constraints

+ sampling



```
lineage(view1).sample_set  
    ==  
lineage(view2).sample_set
```