3 Database Problems in Data Visualization Management Systems

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“Relational”

1. Lineage
2. Consistency
3. Query Mining

Lineage + Interactions
Lineage: high materialization cost, queries slow

backward_trace()

Result 1

forward_trace()

view_refresh()

Revenue
Profit
Price
Product

Revenue
Profit
Price
Product

Lineage + Interactions
Lineage: high materialization cost, queries slow
Interactions expressed as lineage queries

ID
ID
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ID
Lineage + Interactions
Lineage: high materialization cost, queries slow
Interactions expressed as lineage queries

backward_trace( )

view_refresh( )

People don’t want raw lineage
query(backward_trace(..))
They want to query lineage
avoid materialization costs
lineage query optimization

3 Database Problems in Visualization
1. Lineage
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Perception Push-down

Existing Work
Eyes not perfect
Render approx viz

In General
Model human properties
Use models in viz system
Does asynchrony affect users? When?

Hypotheses
1. User task matters
2. Design tricks can improve completion speed

Task matters
Users self-serialize
MVCC (design) has an effect

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What Interfaces to Build?
2 underserved issues

Many useful UI don’t exist due to
high friction or org challenges

Viz systems go for
coverage over task efficiency

Precision Interfaces

SELECT *
FROM blackholedata
WHERE 1.2 < x AND x < 1.5 AND
60 < y AND y < 60 AND
timestep = -50
```
SELECT * 
FROM blackholedata 
WHERE 1.2 < x AND x < 1.5 AND 
   40 < y AND y < 60 AND 
   timestep = now
```

```
SELECT * 
FROM blackholedata 
WHERE 1.5 < x AND x < 1.8 AND 
   45 < y AND y < 65 AND 
   timestep = now
```
Cost ~ UIComplexity + #Nodes + #Edges

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N Database Problems in Visualization
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4. And more…

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