



TEXAS TECH UNIVERSITY™



A STUDY ON 3D REPRESENTATIONS

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1. MOTIVATION



+ Lines



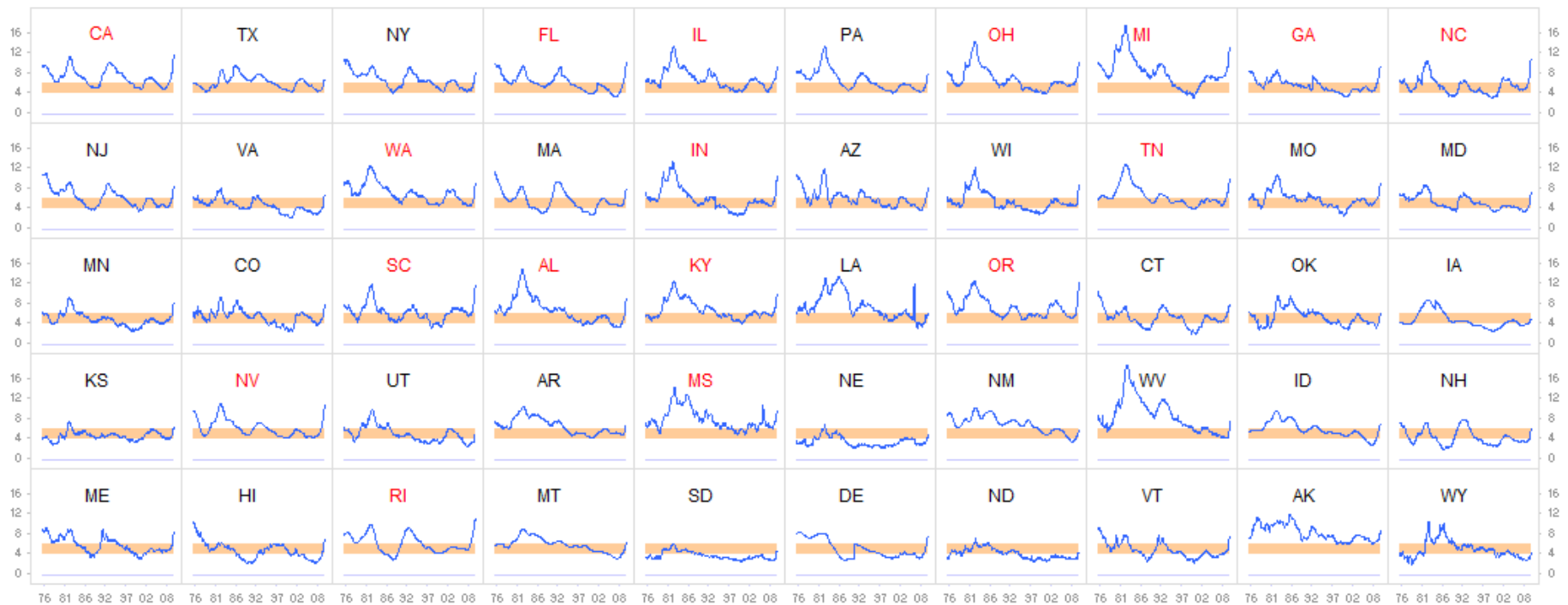
<https://github.com/iDataVisualizationLab/SaturatedThickness>

1. MOTIVATION



+ Small multiples:

Monthly Unemployment Rates by State, Jan 1976 - Apr 2009



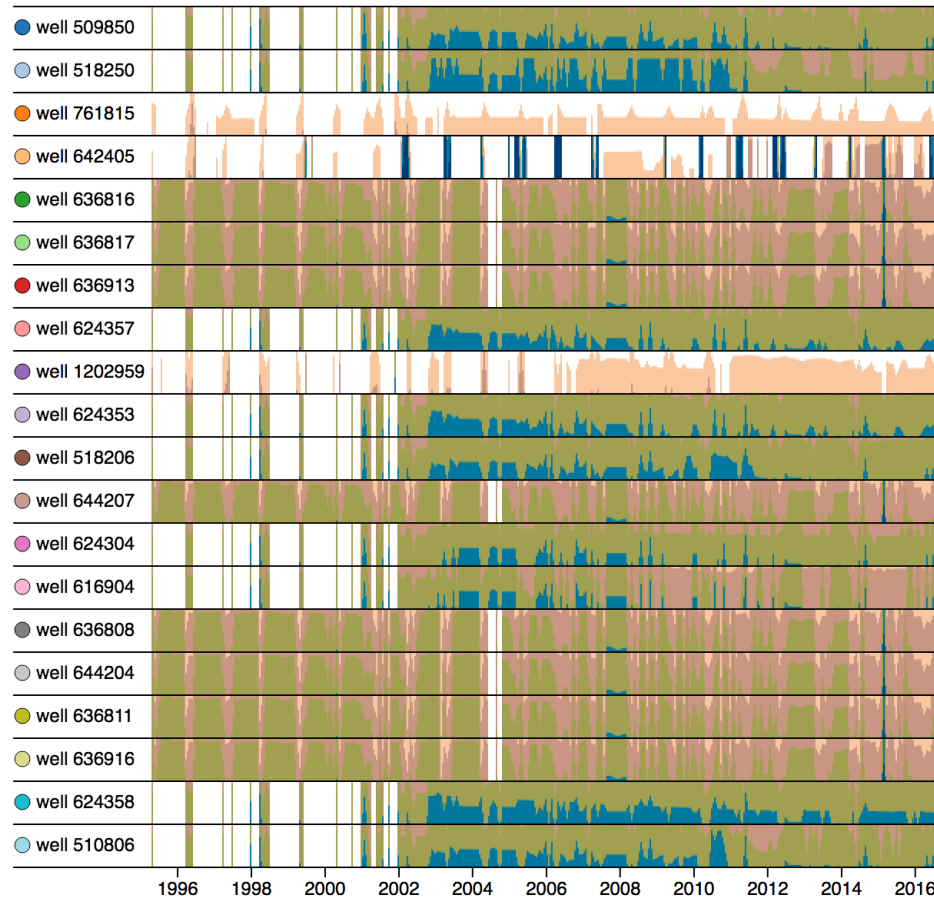
Source: Bureau of Labor Statistics

Notes: The orange band denotes a "normal" unemployment rate (4%-6%);
State code in red: unemployment rate in April 2009 is higher than the US average

1. MOTIVATION



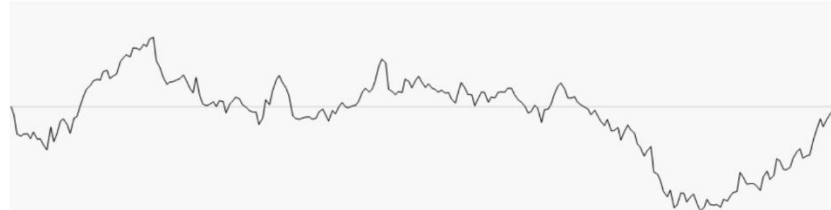
+ Horizon Graph:



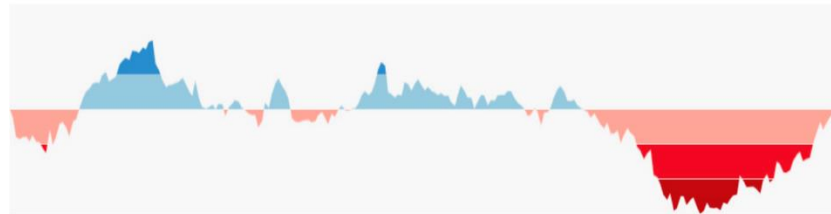
1. MOTIVATION



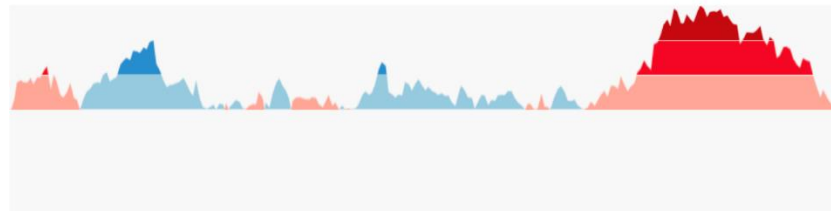
+ Horizon graph construction:



(a) Standard line graph centered around a baseline.



(b) Color (blue is positive, red is negative) and layering.



(c) Mirroring around the baseline.



(d) Wrapping bands into a single space.

1. MOTIVATION



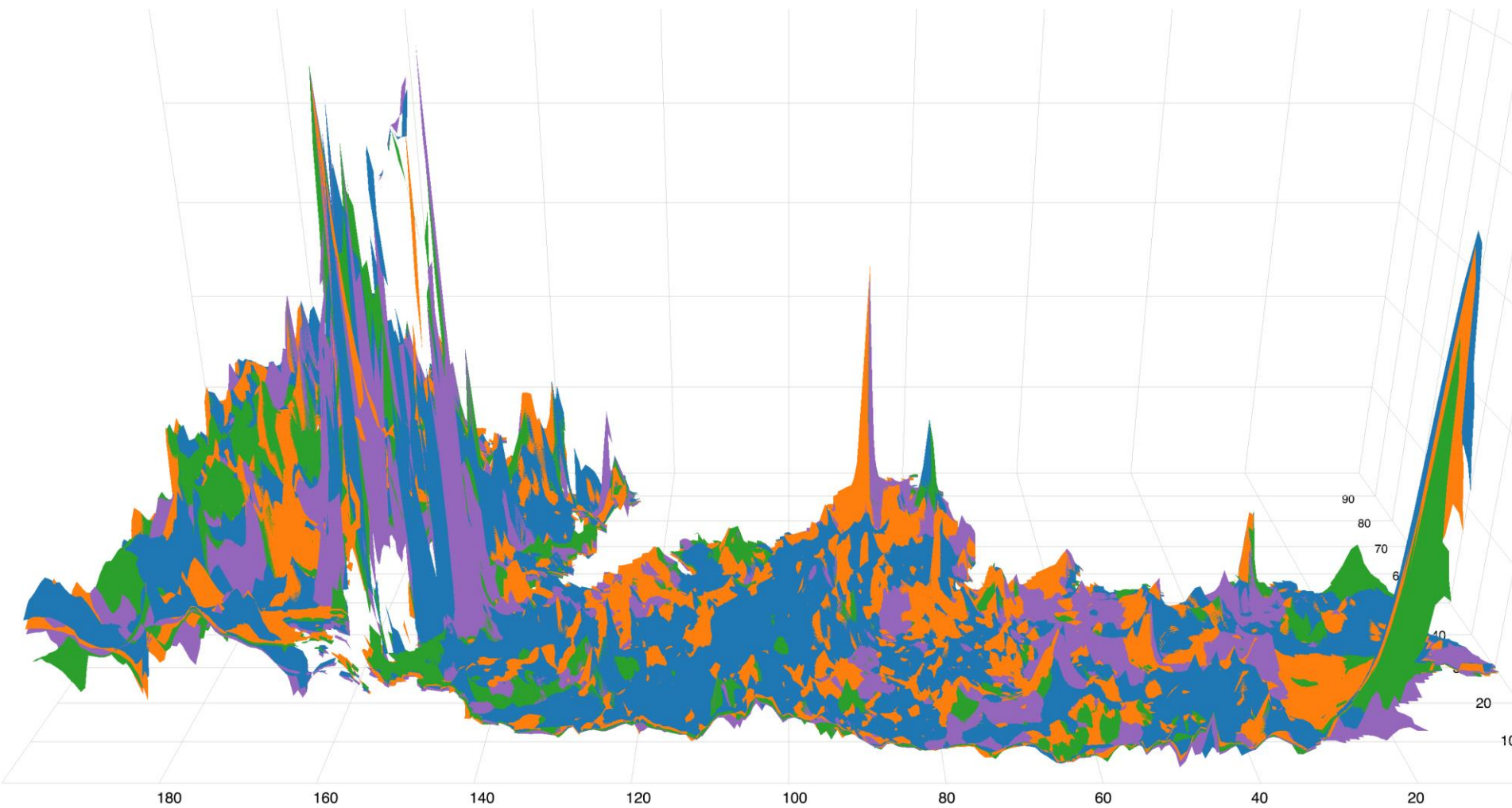
How do these graphs affect to human perception in 3D representations?

2. METHOD

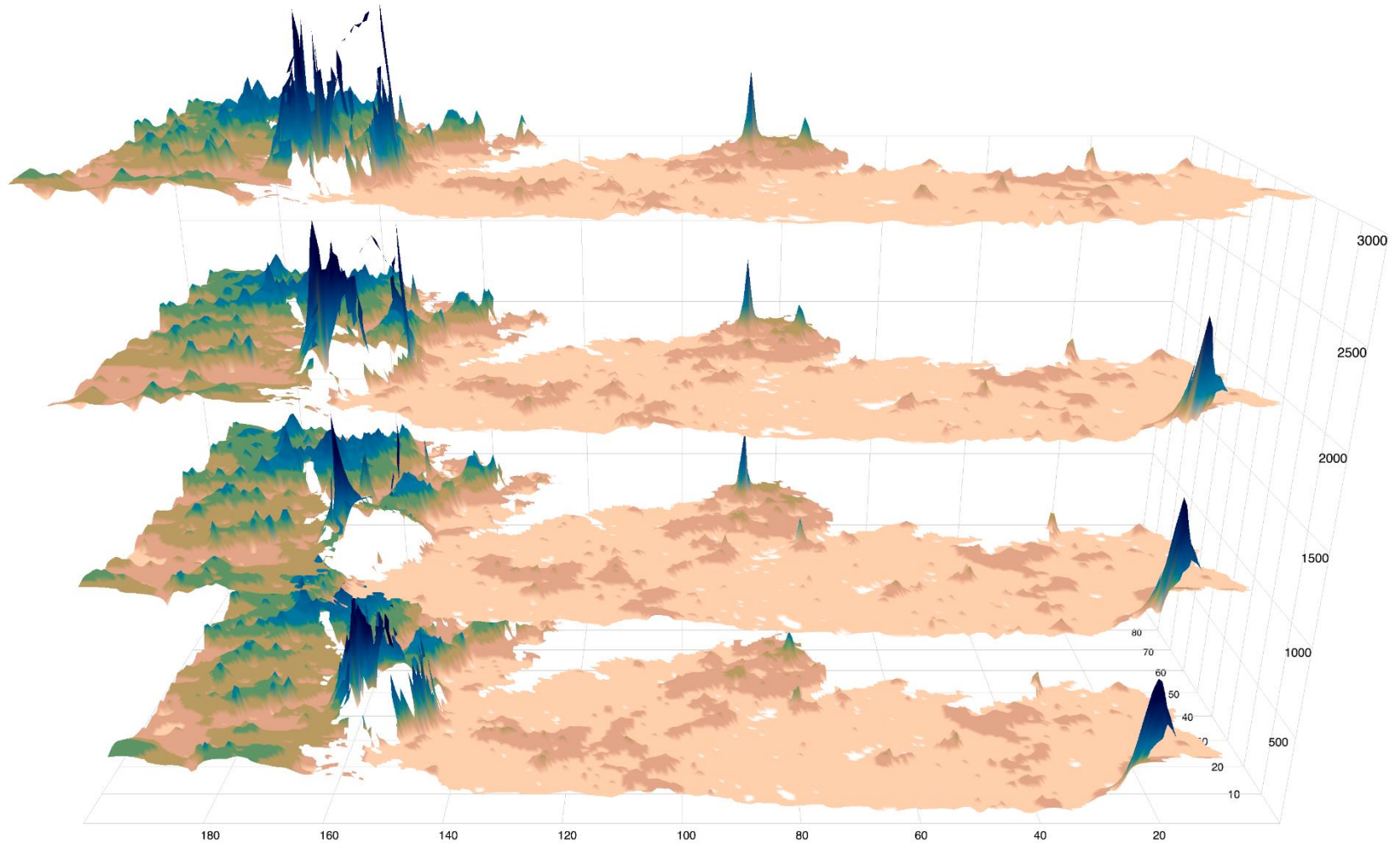


1. Present these techniques in 3D system
2. Design user study
3. Result analysis

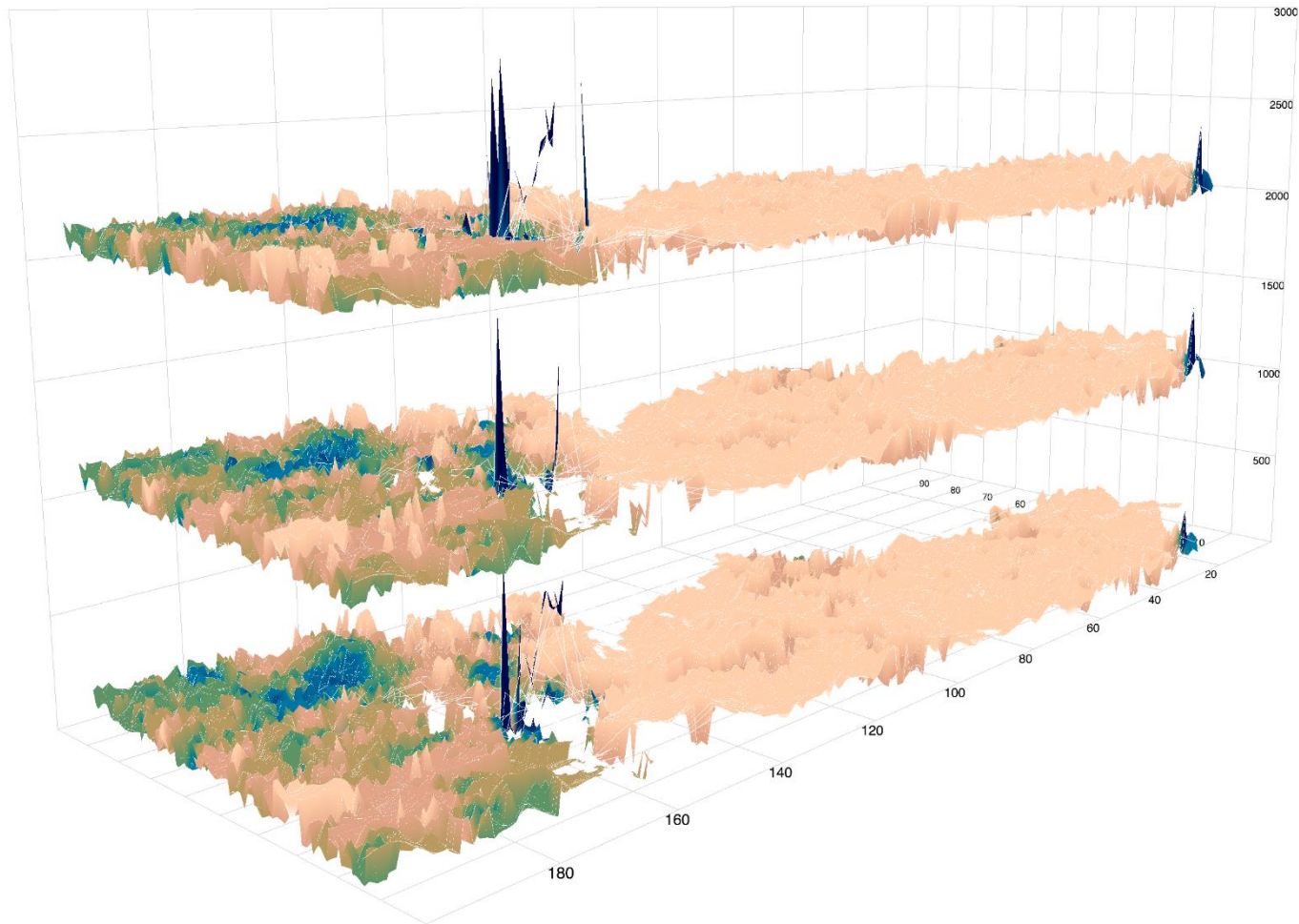
2. METHOD – LINES IN 3D



2. METHOD – SMAL MULTIPLE



2. METHOD – HORIZON IN 3D

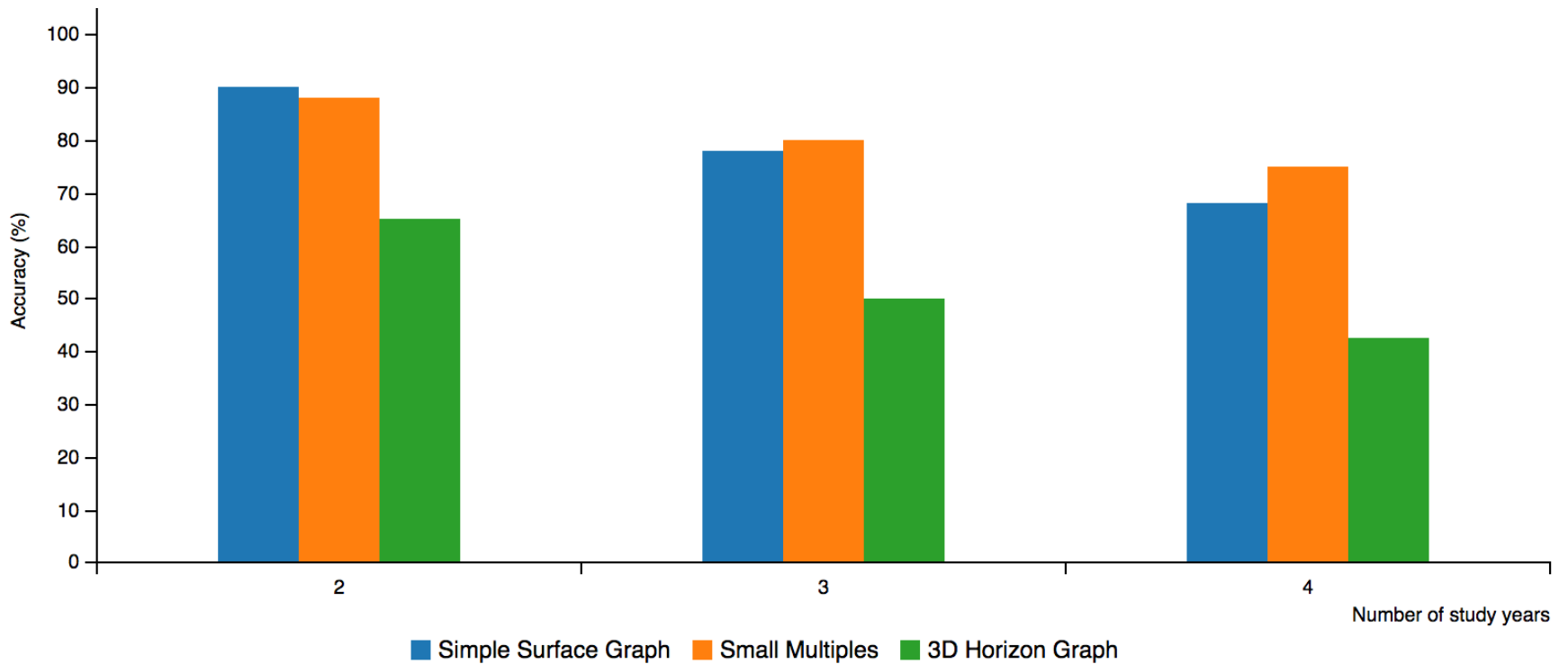


2. METHOD - TASKS

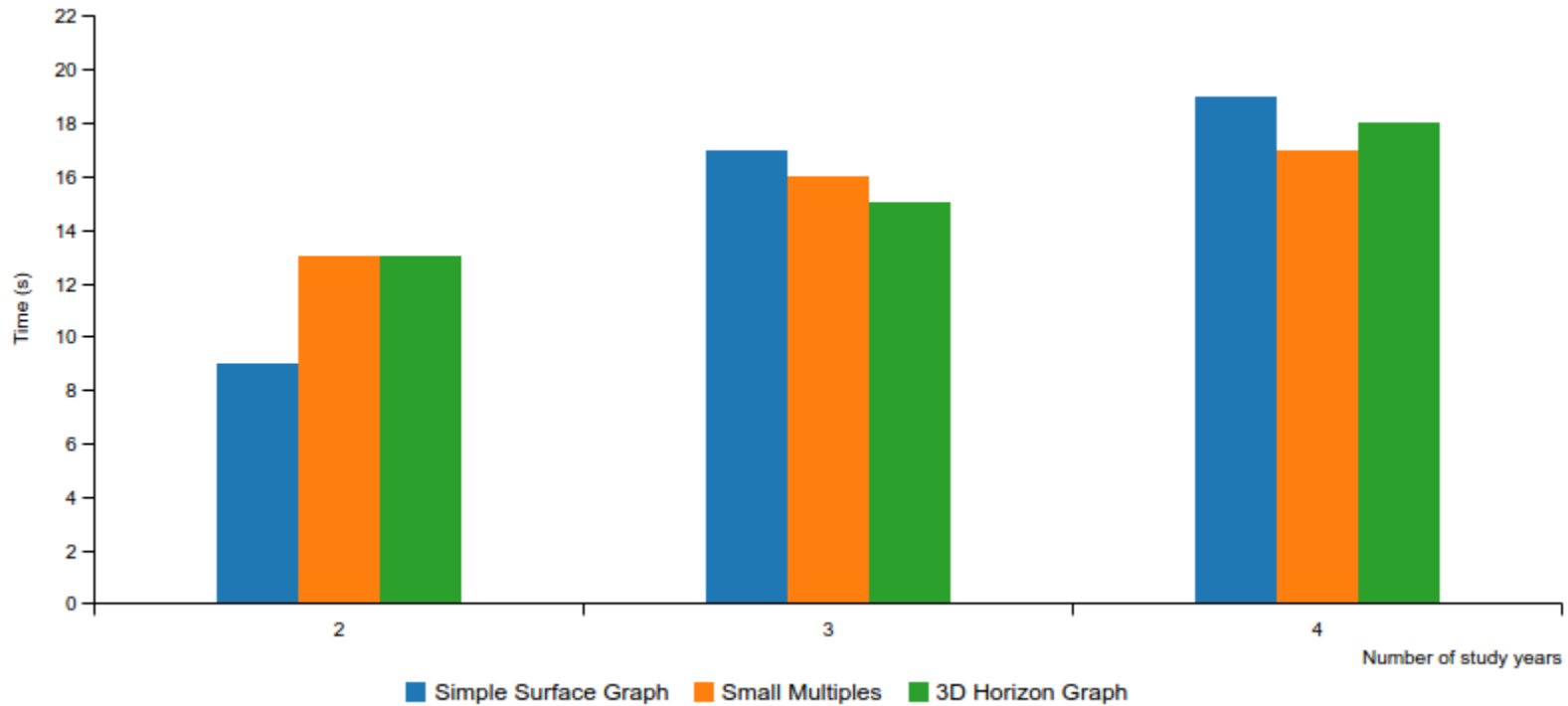


1. Maximum: A simple exact location comparison across all study years (T1).
2. Discrimination: A dispersed location comparison between study years (T2).

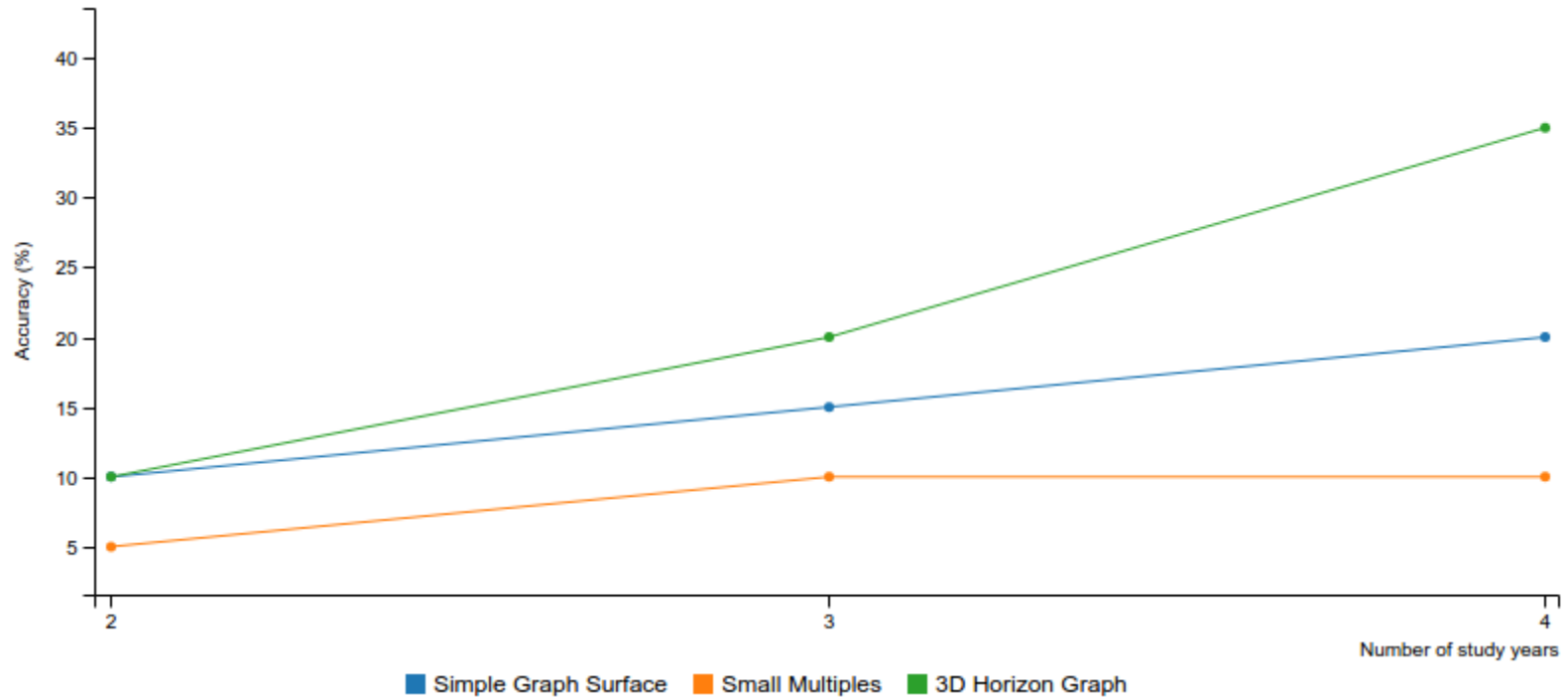
3. STUDY RESULT - ACCURACY



3. STUDY RESULT - COMPLETION



3. STUDY RESULT – ACCURACY DIFFERENCE



4. CONCLUSION



- A few number of simple surface graphs is best for the maximum task.
 - The space that is required to visualize the graph is proportional to the saturated thickness of the graphs.
 - Huge clutter or overlapping with more occurrences.
- The small multiple technique outperforms for larger numbers of study years.
- The 3D horizon graph has the most compact space. But its accuracy is still bottleneck.



4. FUTURE WORK

- Provides more interaction such as a slider to look into any slice of the graph mesh in 3D horizon graph.
- Formal validation methods with support of statistical testing to ensure the correctness of our methodology.

THANK YOU

