

Visualizing Dense Multivariate Graphs with Adjacency Matrices

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Problem Space

Considering node and edge attribute is crucial for many network exploration and analysis tasks. However, effective visualization of both structure and attributes is a challenging problem, especially for dense graphs.

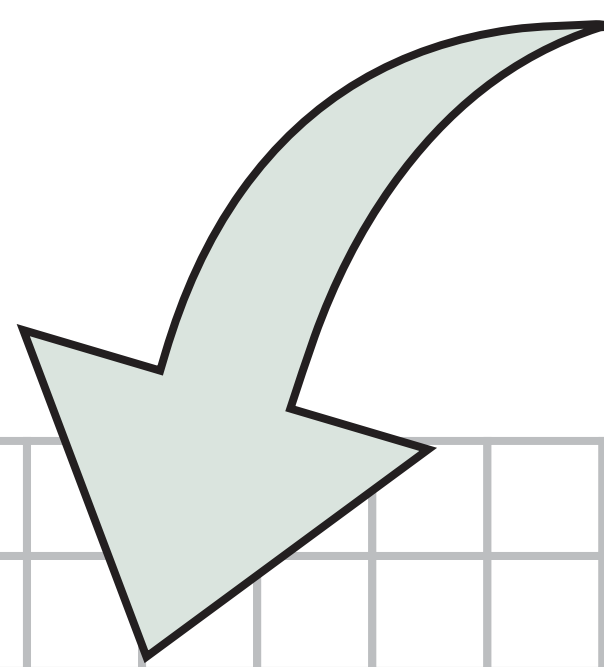
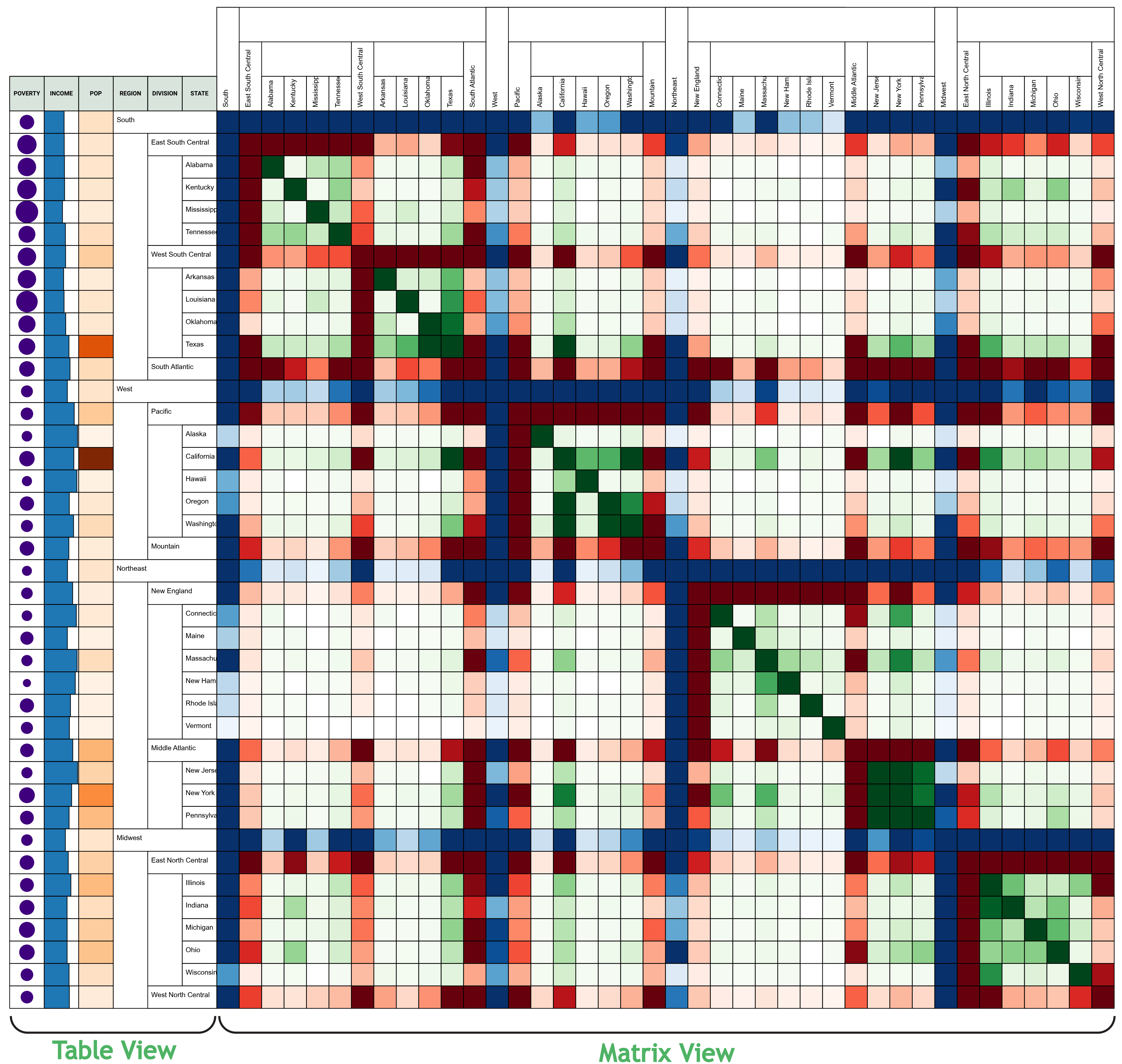
To address this challenge, we introduce TaMax, a novel technique designed to visualize dense multivariate graphs with a diverse set of node and edge attributes.

Table View

Node attributes are visualized in the table view where the rows represent nodes and their attributes are visualized in the columns.

Matrix View

The network topology is shown in an adjacency matrix.



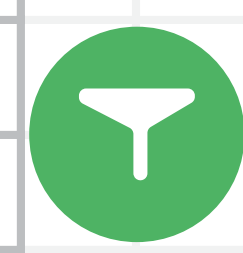
Supported Operations



Sort the rows and columns can be sorted based on the node attributes



Attribute Derivation new attributes can be derived based on current attributes



Filter can be applied to both nodes and edges based on attributes



Aggregate aggregation based on node attributes



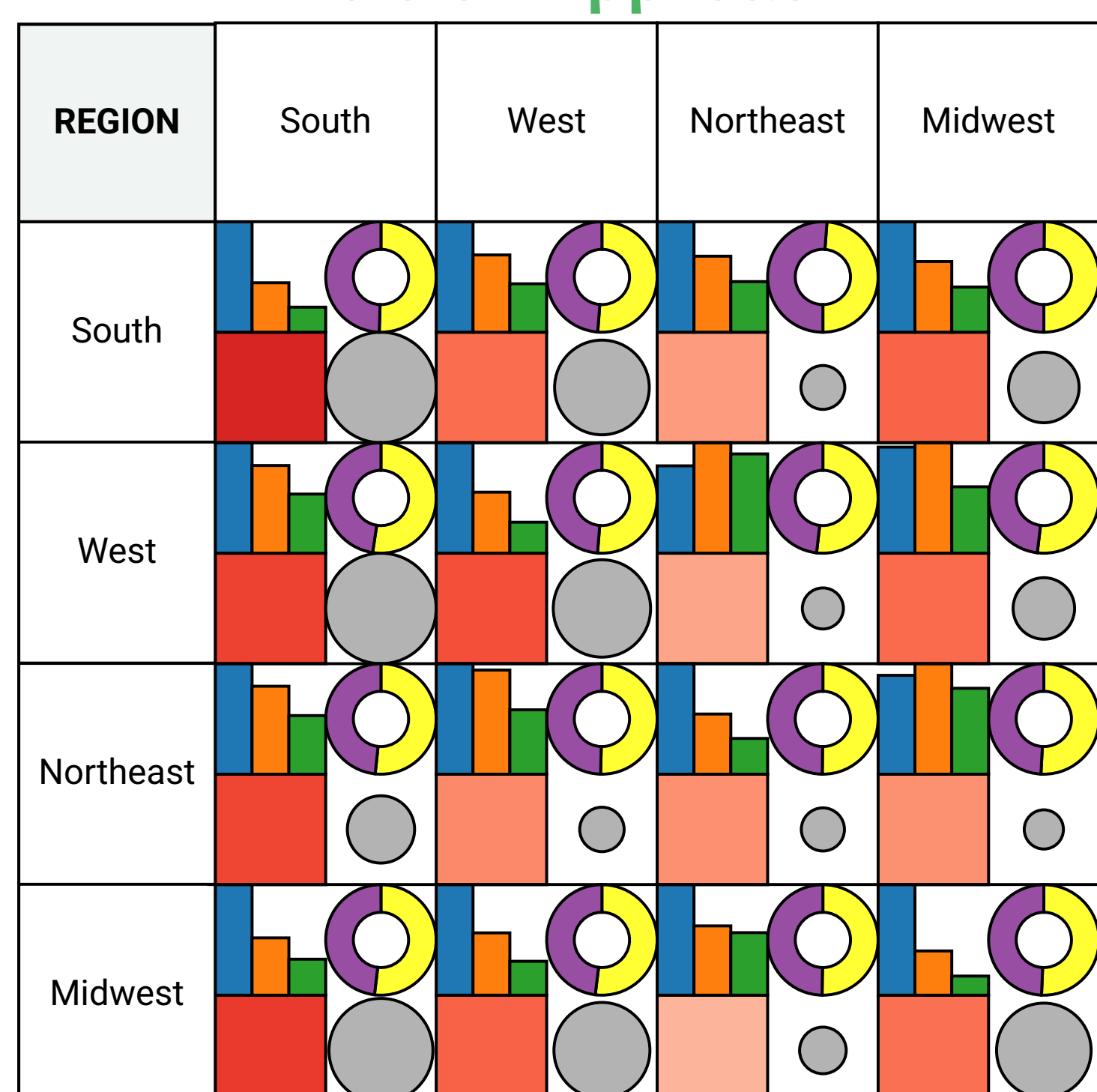
Group flexible grouping based on both numerical+categorical node attributes



Reorder reorder matrix based on numerical edge attributes

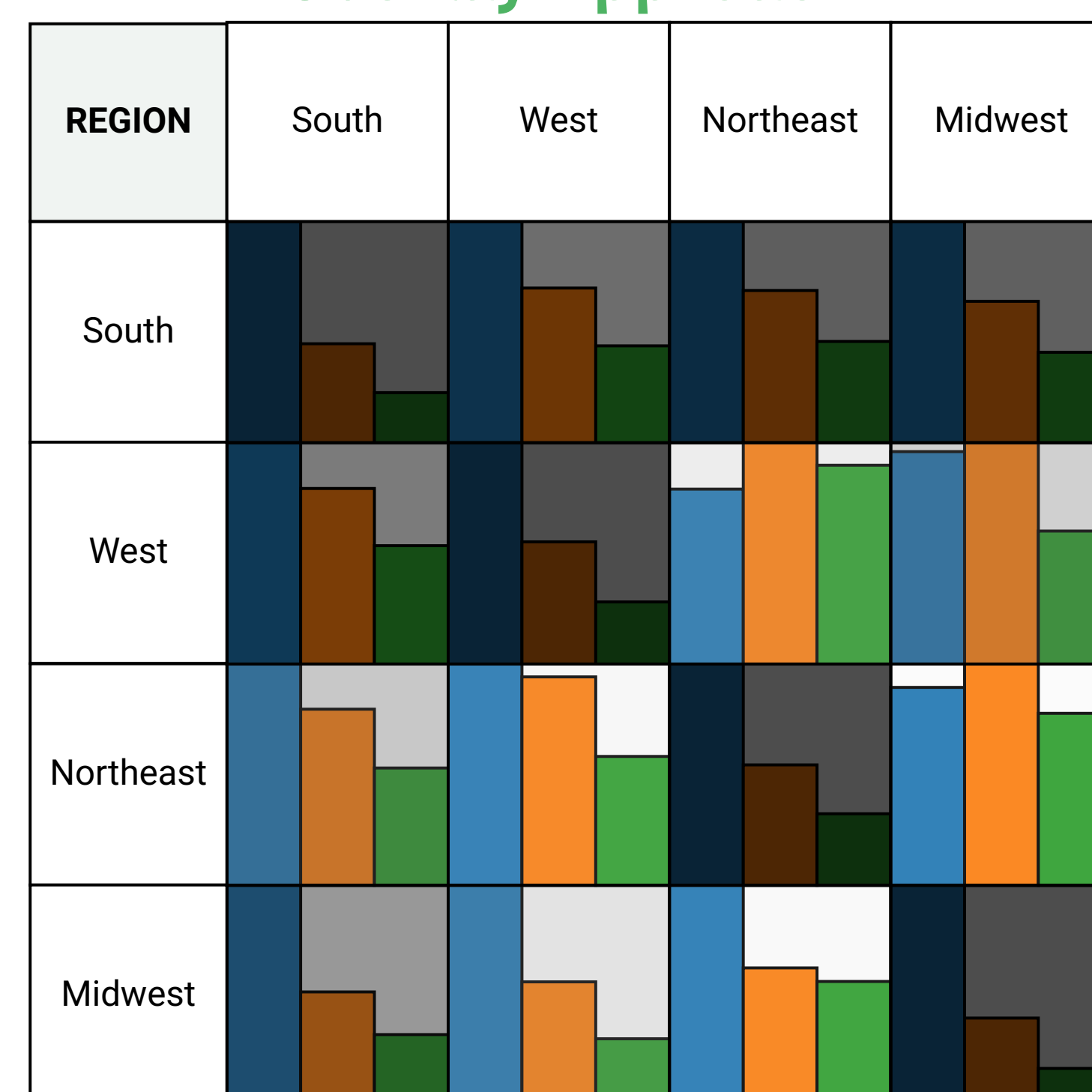
Visualizing Edge Attributes

Division Approach



Each matrix cell is divided into n subcells and the attributes are visualized in them using a variety of different visual encodings: bars, doughnut charts, histograms, nested rectangles.

Overlay Approach



Display two encodings on top of each other. The secondary encoding is achieved by overlaying a transparent rectangle, proportional to a numerical value such as edge counts.

