

# Unfolding Edges for Exploring Multivariate Edge Attributes in Graphs

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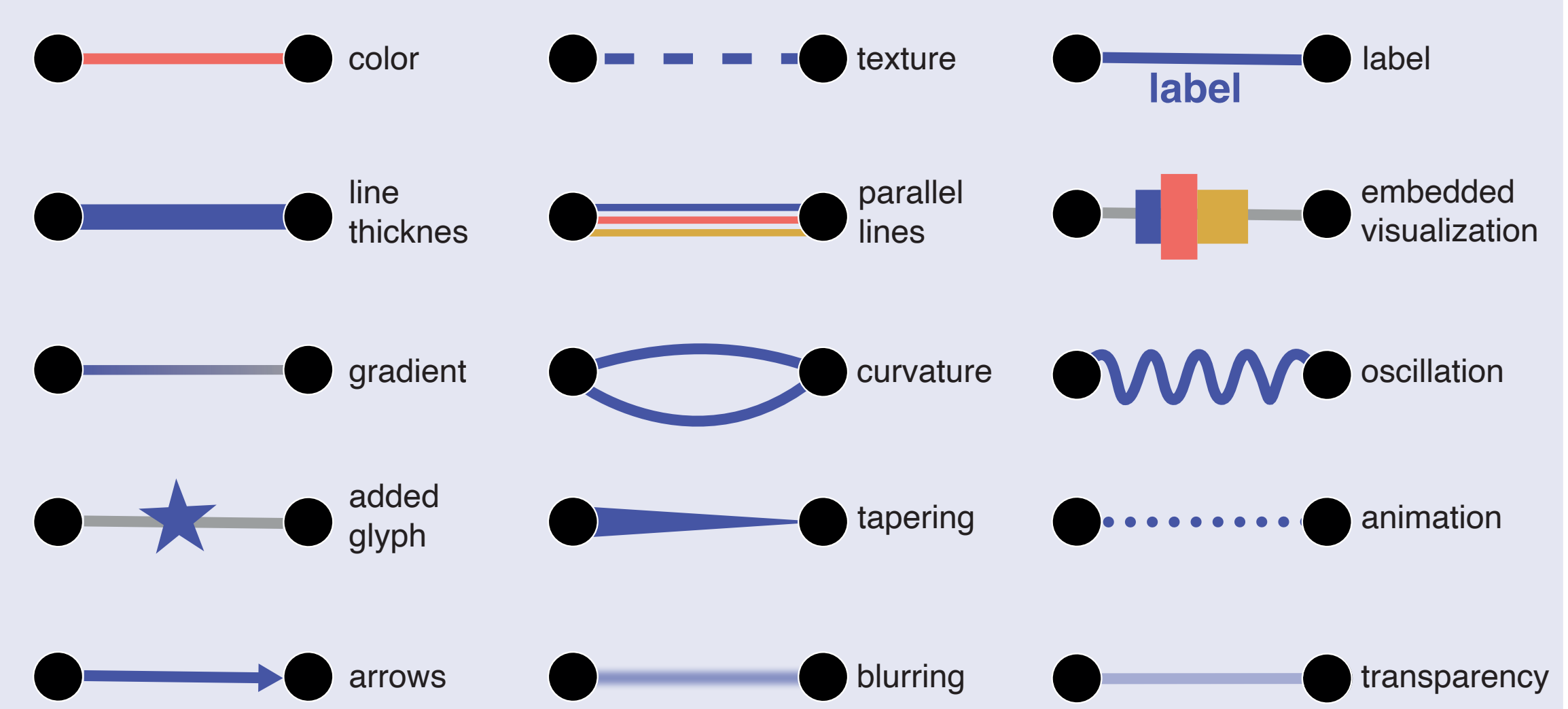
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## WHY?

### MOTIVATION & PROBLEM STATEMENT

- in fields like historical network analysis observations of individual links between nodes and their attributes can be central factors for interpretation of and trust in a visualization
- typically multivariate edge attributes in node-link diagrams are visualized through forms of on-edge encoding
- restricted available space and representation of edges as lines limits the potential for multivariate on-edge encoding possibilities
- adding on-edge encoding globally to all edges of a graph, oftentimes leads to over-plotting and clutter
- only few techniques are available that focus on addressing space limitations of edge attribute representations through interaction

### TYPICAL EXISTING EDGE ENCODINGS



## WHAT?

### APPROACH: UNFOLDING EDGES

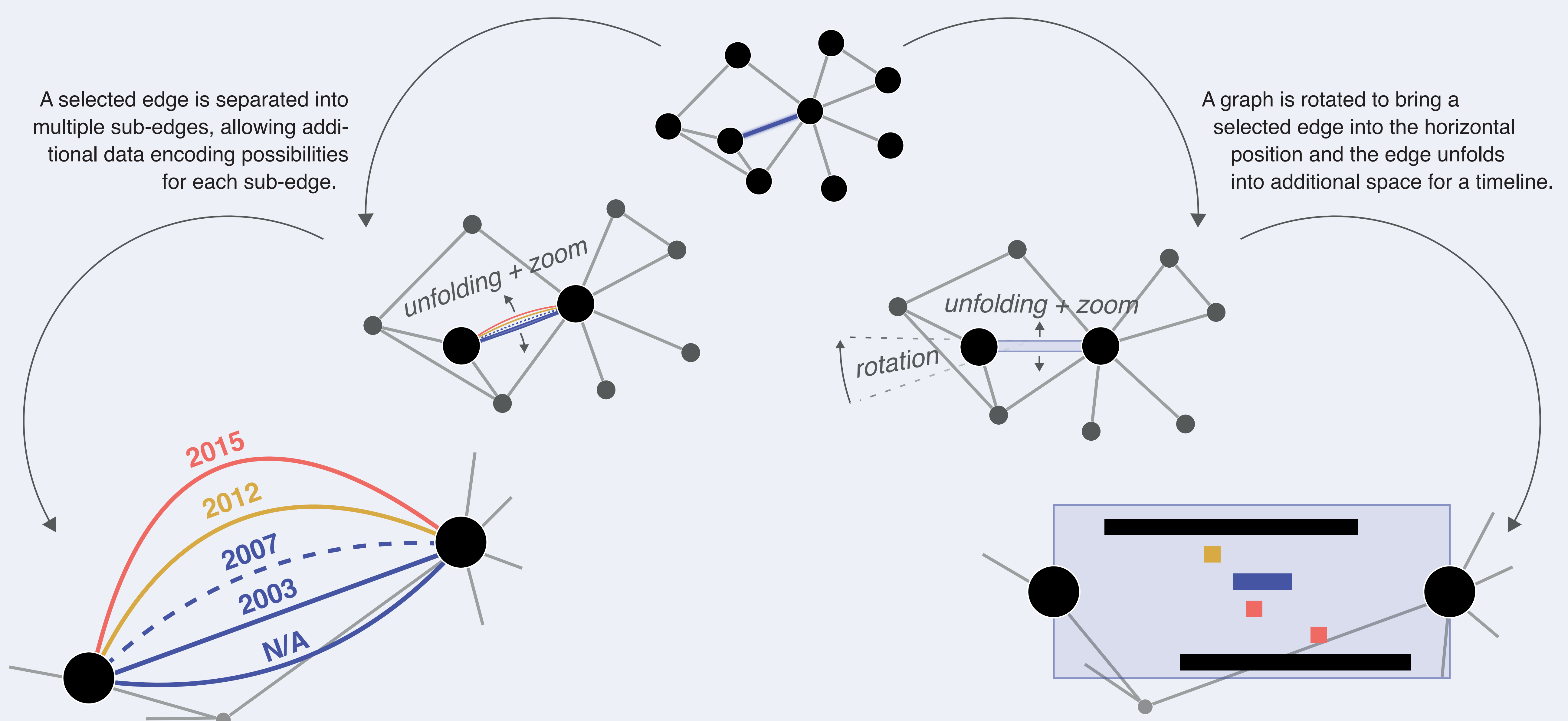
Building up on existing techniques for edge encoding and interaction, we propose »Unfolding Edges« as an approach to network visualization that expands the capabilities for interactive exploration through on-demand detail enhancement of edges and their multivariate attributes. In contrast to techniques that are intended to reduce overall complexity and to minimize occlusions, our aim is to interactively add more detail to selected edges.

- situated & transitioned detail enhancements of edges induced through interaction
- individual and combined use of edge attribute encoding strategies without additionally cluttering a visualization
- detail enhancement of edge attributes without losing global context, facilitating open-ended exploration of other nodes and edges

## HOW?

### TWO EXEMPLARY VARIANTS

Selection of an edge (top) triggers a dynamic rearrangement by transitioning (middle) towards a new on-demand visualization state with increased edge details (bottom).



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