# GridSet: Visualizing Individual Elements and Attributes for Analysis of Set-Typed Data (Supplementary Material 2—Additional Figures)

This supplementary material includes additional figures that demonstrate large, complex, and extreme cases of visualizing a sizable number of elements and sets with GridSet. For these cases, we visualized two large datasets from our use cases on the 4K display. In addition, we are including a result for a set-dependent attribute. In GridSet, visualizing individual elements and their attributes enables the user to support such set-dependent attributes, which heretofore have not been supported by existing set visualization approaches.

Supplementary Figure 1. This screenshot shows Academy Award nominations for 114 different nomination categories (sets) and 6,315 nominees (elements). As depicted therein, thousands of elements in hundreds of sets can be recognized on the 4K display. In this example, the element size represents the number of nominations, and the element color represents all recent nominations in the prior three-year period. The expert spatially organized any similar award categories based on his movie knowledge. This spatial layout was created by the expert when he conducted his analysis of the dataset.
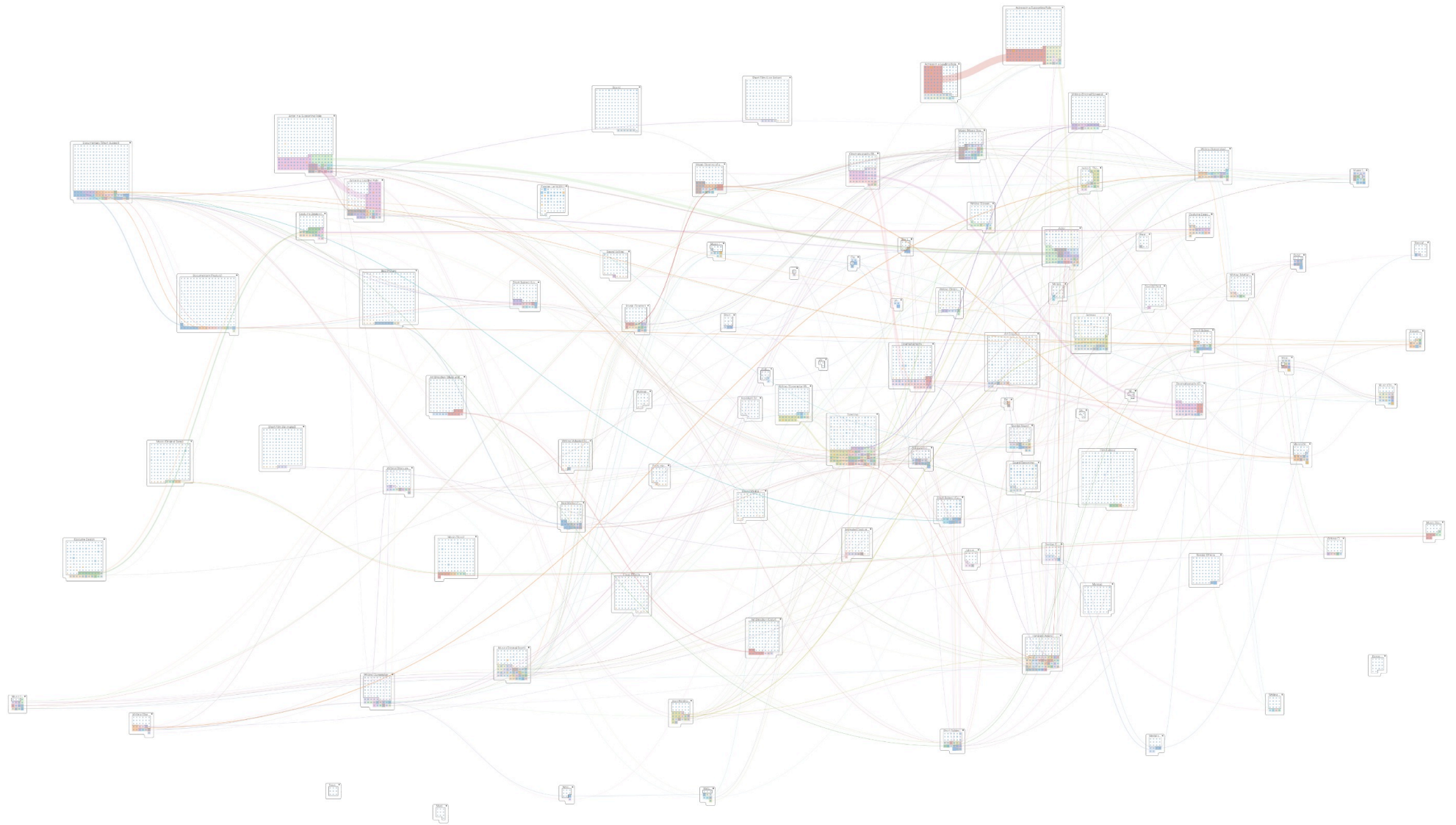
Supplementary Figure 2: This screenshot shows a random layout of the set grids for the same data visualized in Supplementary Fig. 1. Intersections across a large number of sets may result in generating many intersection links and small subdivisions within each set grid, making it difficult for users to recognize the source and target elements of the intersections. Compared with Supplementary Fig. 1, this random layout of set grids generates the occlusions and clutter caused by a large number of intersection links.
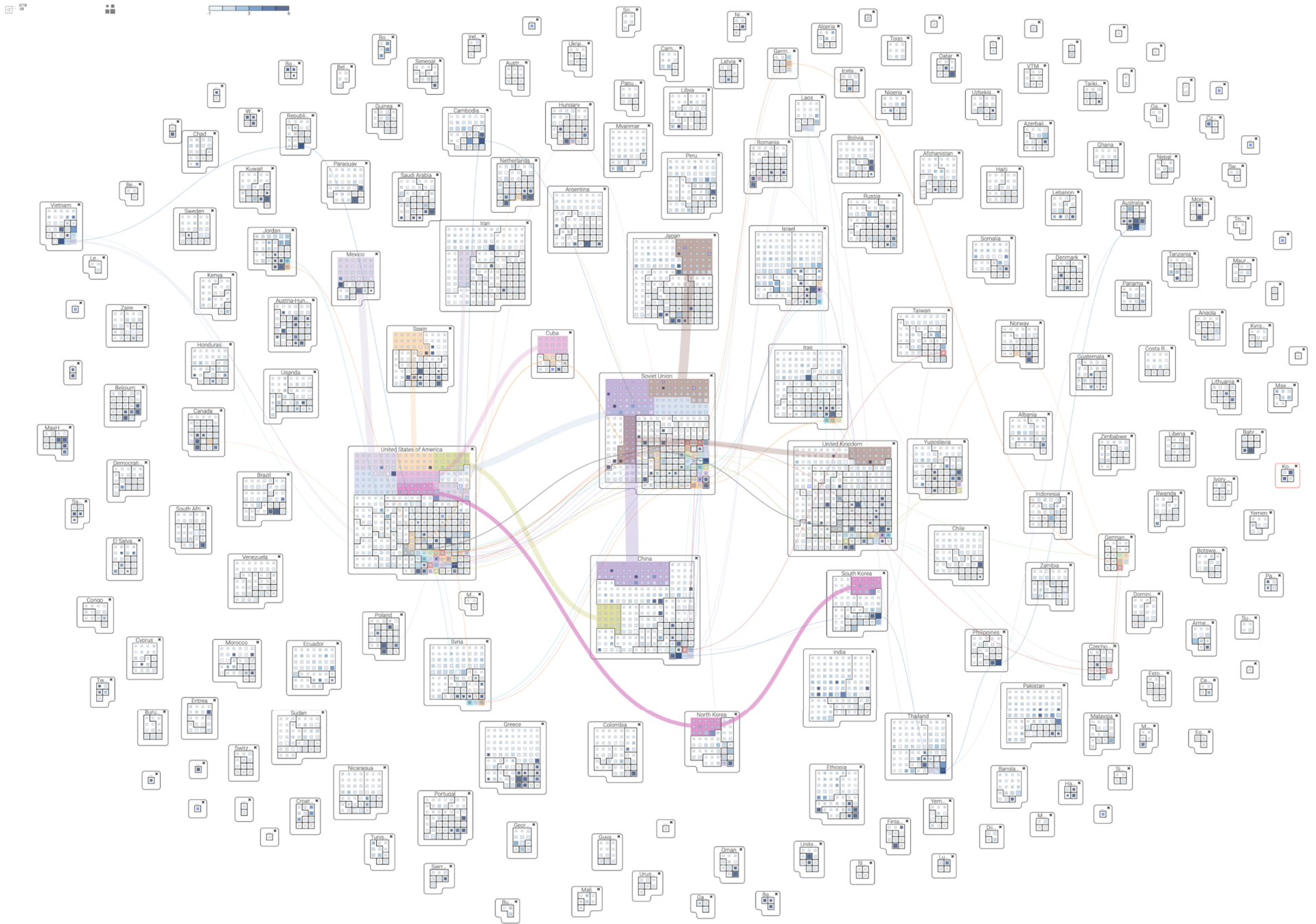
Supplementary Figure 3: This screenshot illustrates a total of 2,561 disputed events (elements) among 392 countries (sets) obtained from a militarized interstate dispute (MID) dataset, which includes a threat, show, or use of force by one state in the international system against another state. For instance, each war and military conflict would involve multiple countries over which the sets were defined. Each dispute was linked to a number of country-specific attributes, such as any military alliances or the hostility level of each country.
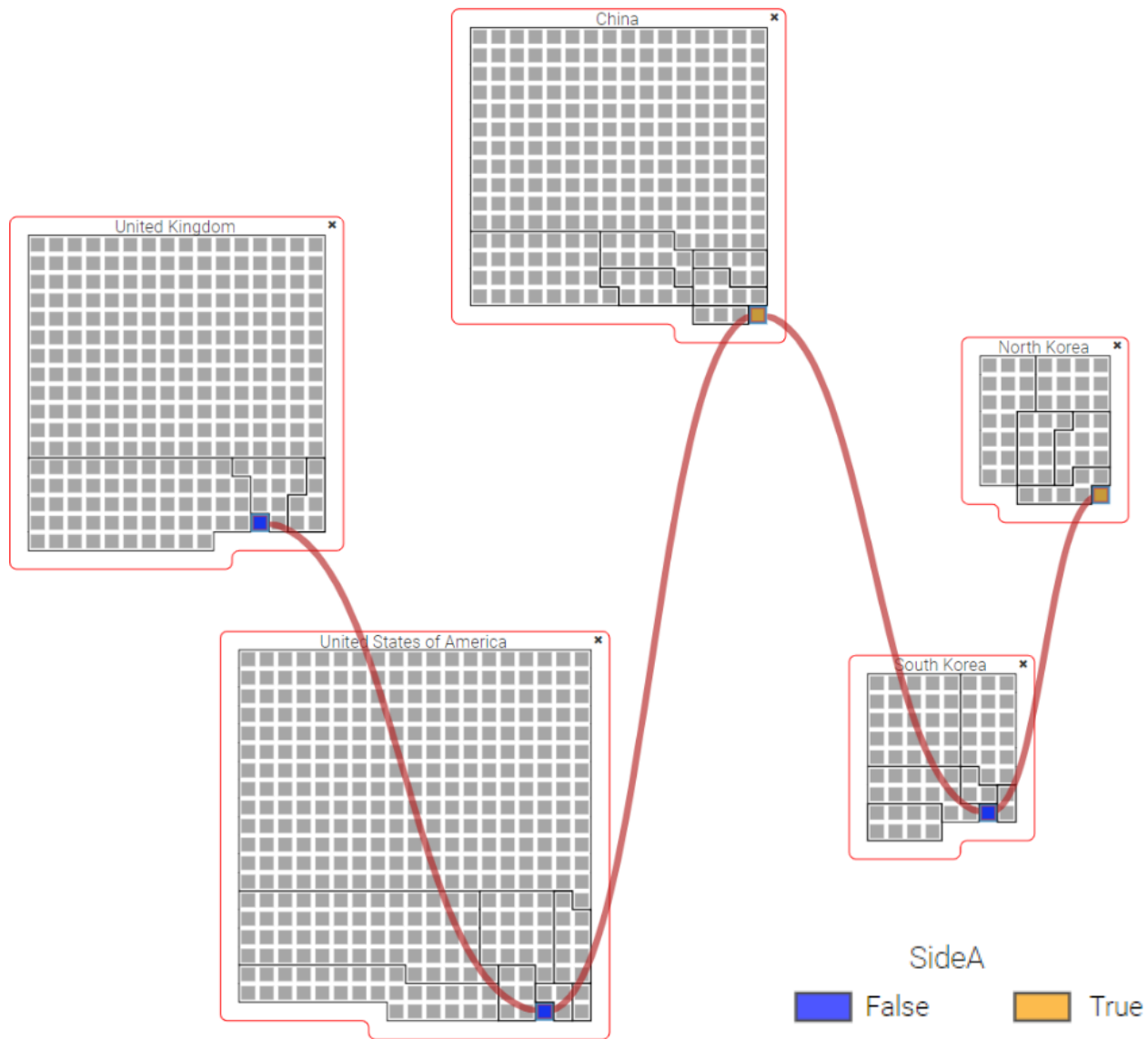
Supplementary Figure 4: The set-dependent attribute is visualized to show the status of allies in the Korea War, which are connected among combatant nations through a red link. Different country sets can be shown to form military alliances for specific dispute events (The ally status as a set-dependent attribute is Boolean.). Since GridSet duplicates elements in multiple sets, it can visualize attributes in a direct way. In this figure, the attribute SideA depicting ally status can be visualized easily with simple color-coding (blue and yellow). Note that South Korea, North Korea, the United States, the United Kingdom, and China intersect the same dispute element (dispute ID: 51—the Korea War), but each country's attribute SideA—again, referring to ally status—has different values. The same color (green or orange) of element glyphs represents ally status in the Korea War.