

The Circle Of Thrones: Conveying the Story of Game of Thrones Using Radial Infographics

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ABSTRACT

The use of infographics has proven to be effective in conveying information to an audience. Movie plots, given their complexity and rich metadata, are usually good candidates to be visualized using such an approach. In this project we investigated the problem of visualizing the relationships between the characters of the popular television show *Game of Thrones* inspired by the book *A Song of Ice and Fire* by George R. R. Martin. The amount of information to display and the complexity of the relationships between the characters proved this task to be difficult, therefore we propose a radial layout designed to reduce clutter and enhance readability, which is suitable also to an audience not familiar with the show. Our proposal stands alongside the State-of-the-Art and opens the way to a new class of techniques for the visualization of complex social interactions.

Index Terms: Visualization—Visualization techniques—Radial Layout; Visualization—Storytelling—Infographics

1 INTRODUCTION

The use of infographics and visualizations is an effective and recognized way to tell a story [2, 3, 6]. Movie plots, for instance, represent complex interactions between the characters and have been used as proving ground for many visualization techniques [5], such as storylines [4, 7], “story curves” [1], and others.

In this manuscript we investigate how to visualize, using infographics, a snapshot of the relationships between part of the characters of the TV show *Game of Thrones* (*GoT*) as of the end of the 7th season. The reasoning behind our choice lies in the complexity of the plot, in the popularity of the show and on the availability of a complete dataset (as explained in Section 1.1). With so much information to display, our research question lies in how we can create a readable but accurate and faithful visualization. Therefore, our main contributions are:

- A radial layout of the characters of *GoT*, along with their relationships and status. Our solution is as faithful as possible to the data but also designed to avoid excessive clutter and improve readability;
- A legend, a set of figures and visual cues conceived to help the readers interpret the infographic easily and as intended.

The manuscript is organized as follows: Section 1 introduces the problem, our motivation and the dataset description, Section 2 describes the solution adopted and Section 3 reports our concluding thoughts on the work done.

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1.1 Dataset Description

The dataset is taken from the “International Symposium on Graph Drawing and Network Visualization” contest¹. One of the topics deals with *A Song of Ice and Fire* and contains a snapshot of the relationships among a part of the characters of George R. R. Martin novels. The data is represented as a graph, which is a data structure consisting of elements called nodes and edges (namely pair of nodes) representing the relationships between the nodes. Edges can either be directed, meaning that the edge represents an ordered pair of nodes, or undirected (edges have no direction). The dataset contains labeled nodes (representing the characters) and labeled “multiple” edges in the common *graphml*² text file format. A multiple edge means that several edges may exist between the same pair of nodes, each one with different properties (representing the various kinds relationships between the characters).

The dataset consists of 84 nodes and 216 edges. Nodes store the following information: (i) character’s name, (ii) status (alive/dead), (iii) affiliation to a “house” from birth/marriage and (iv) group affiliation. The information about the character’s affiliation to a house or group may not be found on every node.

The edges in the dataset are following:

- **Killing**, (directed), the source is the character that killed the target;
- **Father, mother, sibling** (directed), the source is father/mother/sibling of the target;
- **Lover**, (undirected), those characters are lovers;
- **Spouse**, (undirected), those characters are (or have been) married (see Section 2.7.2);
- **Allegiance**, (directed), the source character has an allegiance with the target character. Each of those edges has a property describing the type of allegiance which can be (i) “Hand of the King”, (ii) “Member of the Kingsguard (or Queensguard)”, (iii) pledge, (iv) oath, or (v) pet.

2 LAYOUT SOLUTION

Our graph visualization (see Figure 4) has a focus on showing the events in *GoT* and leverages the strong implicit family structures within the dataset. The result is a radial layout with family clusters and generation layers with action edges through the center and allegiances on the outside.

In the following we describe how we depicted the distinguishing features of each character and their relationships. We also describe the decisions that were made to optimize the visualization and to achieve the final layout. The high resolution version of our infographic can be downloaded from the internet³.

¹<http://graphdrawing.de/contest2018/topics.html>

²<http://graphml.graphdrawing.org/>

³<https://tinyurl.com/ybqq2tgt>

2.1 Layout

Our approach is a placed-by-hand radial layout, which is beneficial for depicting the inherent and easily readable structure of the dataset. Nodes are put onto a circumference (with a few exceptions) with the inner part of the circle and outer space left for the edges. The circumference is split into several sectors that represent the great houses; the nodes are put inside each sector depending on their affiliation. We discuss in depth how we visualize nodes in Section 2.2. The circular ordering (i.e. the ordering of the houses) depends on the marriages. We put houses with marriages in common close together. This way, we could visualize part of the relationships with only a symbol rather than an edge, clearing up the picture. Visualization of edges and relationships is discussed in Section 2.3.

Characters which have no affiliation are placed close on the external side of the circumference. However, other constraints might give information about the context. The “Night King”, for example, which is placed in the top left corner of our visualization, roams far beyond the “Wall” (which is, in the book and TV show, a frontier made out of a tall wall of ice), then he is put well outside the radial layout next to a mountain of ice.

2.2 Nodes

To display nodes, we used portraits, frames, gray-scale, glyphs and other contextual information (e.g., a symbol for “*The Hand*”). The portraits show the actors who interpreted the characters in the TV show. The frame surrounding them is used to display if he/she is/was king or queen. The gray-scale is used to show if a character is dead (see Figures 1 and 2) with the frame color following the same principle. “Cersei’s” frame is special to differentiate her from the other kings (she is the one sitting on the “Iron Throne”).

We decided against putting names next to the portraits of the characters to reduce clutter. Our rationale is that names don’t hold any information for an audience unfamiliar with *A Song of Ice and Fire* anyway. On the other hand, people who watch the show will have no problem identifying the given portraits.

2.3 Edges and Multi-Edges

We visualized the different relationships in two ways: “explicit” edges, which are lines with a shield bearing a symbol representing their type, and “implicit” edges, that are relationships represented by other visual cues rather than lines, like proximity, icons, etc. Explicit edges are used to visualize the following relationships and are put both on the inside and on the outside space of the circle:

- **Killings:** killings are represented by curved lines. Their symbol is a sword pointing to the victim (e.g., see Figure 1). Some of the killings are represented in a more “atmospheric” way to give more context and to be more appealing to people who are already familiar with the show: Cersei’s killings are visualized using a green hyperedge (an edge connecting more than two nodes) with a bomb (and not a sword) symbolizing the wildfire burning on “King’s Landing”;
- **Romances:** romances are represented by curved lines with a heart symbol (e.g., see Figure 1);
- **Allegiances:** allegiances are the most numerous relationships after the killings, so they were not put in the middle of the circle but on the outside to reduce the cluttering. Such edges are represented by a combination of curved and straight lines. The turn directions for each edge are indicated, to prevent misreadings at crossing lines as shown in Figure 3. The color of such edges is blue, and the different kinds of allegiances are represented by different symbols. The “Hand of the king” is represented by a stylized hand, the “Kinsguard/Queensguard” allegiance is represented with a crown and the pledge with

a shield. The “pet” allegiance is represented implicitly as described further in the paper.

Moreover, where edges cross into the colored region of a house, the lines become dotted to further improve readability.

The relationships visualized using implicit edges are the following:

- **Family Relationships:** the characters are arranged in the respective sectors according to their family tree. The characters belonging to the same generation are arranged on the same “level”, with the eldest generations on the outer part of the sector and the younger ones arranged going inwards. Therefore, siblings share a level, as well as spouses. Since the hierarchical radial layout already conveys an impression for family structure and generations, we feel comfortable leaving explicit family relation edges out of our visualization. Our visualization focuses more on the story, i.e., killings, romances, so we decided against including the very detailed family tree relations, while still providing the general information about it (see e.g., Figure 2);
- **Spouses:** weddings are represented by a couple of rings that “holds” together two nodes (e.g., see Figure 1);
- **Pets:** pets pledge their allegiance to their owners (except for “Viserion”, see Section 2.7.3). For this reason, we placed them touching the base of their owner’s node and be given special symbol, like dogs and dragons (see e.g., Figure 2).



Figure 1: An example of two characters that are married (notice the two rings) and lovers (the pink edge). However, “Littlefinger” (the character at the top) killed “Lisa Arryn” (notice the dark edge with the sword pointing towards her). By looking at the colors of the portraits, it is possible to see that both characters died.

2.4 Colors

For each great house we took the dominant colors of its crest and gave them some more brightness (because they are fairly dark colors) and added opacity so that we can still overlay edges without any color issues (clutter, visibility/readability problems).

2.5 Legend

The legend on our visualization explains all depictions that could be unclear. Some symbols and signs are fairly self-explanatory (e.g., marriage). On top of the legend, a “wind rose” depicts which sector of the large circle belongs to each of the great houses.



Figure 2: The “Stark” family tree. Their pets are shown too (dead pets are the ones whose icons are crossed by a red bar). It is easy to understand who are the surviving members of the family.

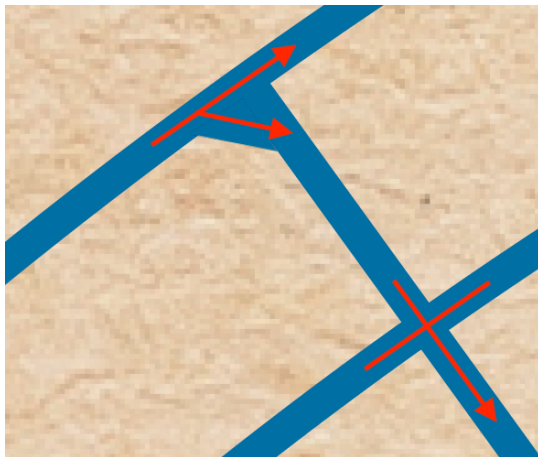


Figure 3: A close-up on the corners used to depict the direction of the edges. If the corner is absent, the two edges just cross.

2.6 Background

We used a thematic yellowed parchment as a background, to further the reader’s immersion into the fantasy world. One can imagine how a maester could have drawn the map by hand in the dim light of a candle in the Citadel in Oldtown.

2.7 Difficulties in Dataset

There are many combinations of nodes and edges that make it hard or impossible to stay true to the intended layout and design. We now will give a brief description of the most relevant cases.

2.7.1 Status Uncertainty

Everybody is *alive* or *dead*, except for “Beric Dondarrion”, whose status is *uncertain*. Here half the picture is colored (indicating aliveness) the other half is desaturated (indicating death). The intended meaning is that he can be dead or alive.

2.7.2 Marriage and Spouses

We tried to put all *spouse* relationships next to each other and link them with the *double ring* symbol for marriage. However, “Sansa Stark” is married to “Ramsay Bolton” and “Tyrion Stark”: it doesn’t make sense to put them all close together. In other cases like “Ned” and “Catelyn Stark” this works fine. Marriages put whole houses next to each other in the radial layout. This is problematic if adversarial houses have some kind of bond in marriage. To avoid the visual clutter in the graph and to not mix up temporal information, we opt to display the last marriage or spouse relationship. That means we only depict the most recent spouse relationships.

2.7.3 Temporal Information

There is also some temporal information within the dataset, such as: (i) John Snow kills and is killed by his brothers of the Night’s Watch and (ii) the dragon Viserion is allegiant to “Daenerys” before and to the Night King after its death. We tried to show this shift of allegiance by simulating the “motion” of the dragon icon from Daenerys to the Night King. It is difficult to convey a sequence of actions in what is otherwise a snapshot of the character landscape.

2.7.4 Small semantic differences

It is often debatable if the reader gains meaningful information from differentiating the different kinds of allegiance: oath and pledge, kingsguard and queensguard and Hand of the King. The options are to group these together for better readability or insert even more different types of edges. We chose to group oath and pledge, as a simpler “allegiance” relationship, while keeping kings/queensguard and Hand of the King as distinct relationships. We chose this solution because it is the one that bears the most information without excessively encumber the visualization.

3 CONCLUSION

With our radial infographic we captured the overall structure as well as intricate details of the given dataset in a visually pleasing and very readable way, while dealing with errors and exceptions as well. We made good use of the inherent structure of the dataset and used many different layout, design, and aesthetic tricks to organize the complex relationships between the characters in *A Song of Ice and Fire*. This approach might encourage the research on radial layouts to effectively convey (and help unfold) the complexity of real-life social interactions.

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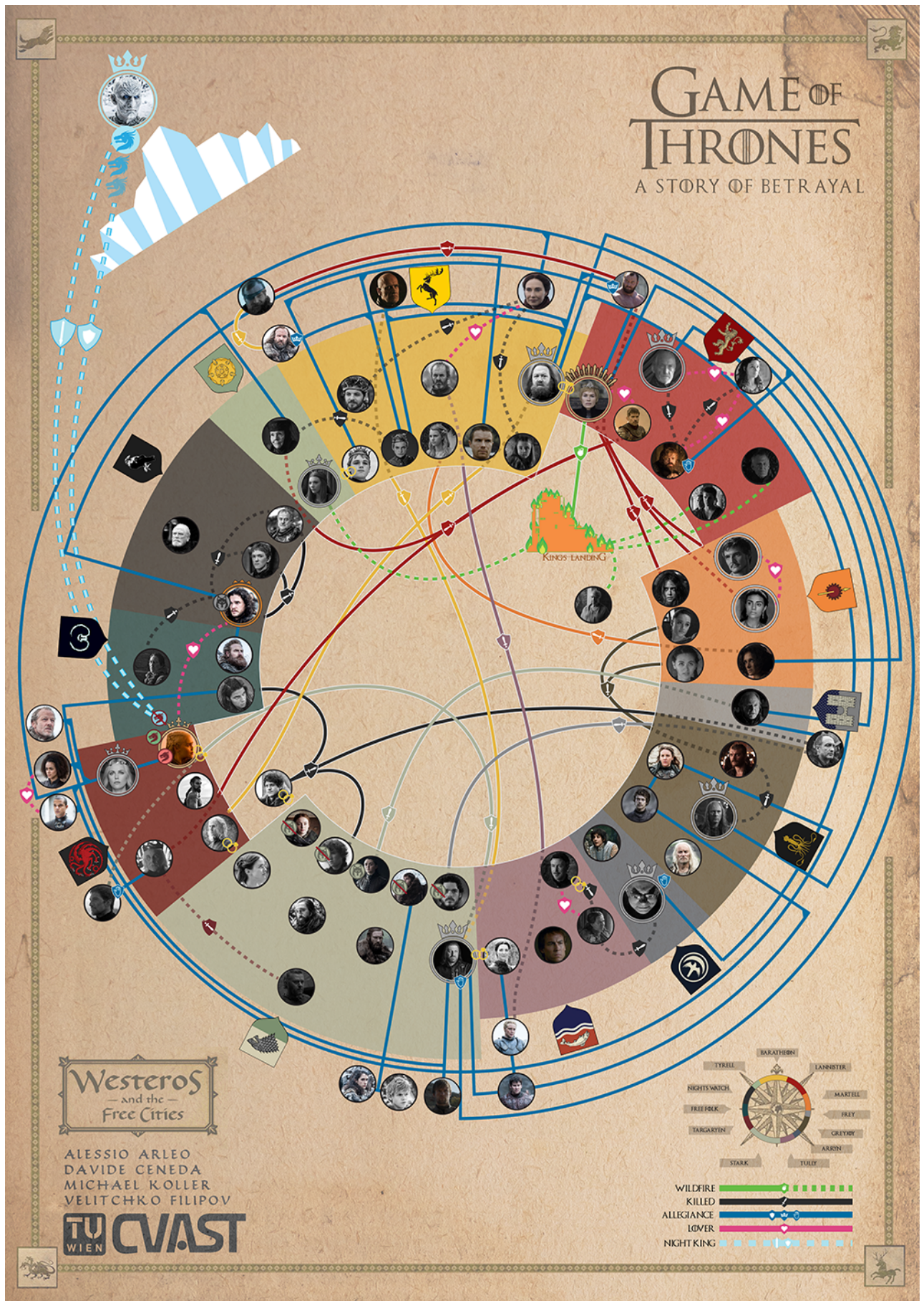


Figure 4: The complete infographic. In this figure the whole picture is shown. Please refer to Section 2 to find the link to download the full resolution version.