Integrating thematic Maps into Storyline Visualizations
Master 2 Internship
Vanessa Peña-Araya and Anastasia Bezerianos
{vanessa.pena-araya@inria.fr, anab@lri.fr}

Although we hope to be able to work at the lab, this internship can be done remotely if necessary.

Internship period: starts starting in March/April 2021, 5 or 6 months duration.
Supervisors: Vanessa Peña-Araya and Anastasia Bezerianos
Location: ILDA, Université Paris-Saclay, building 660.

In several domains, the exploration of relationships among entities of different types are part of practitioners’ daily work. For example, in journalism, news articles that report on the cities visited by two politicians during an election campaign can be useful to explain the voting results in those cities later. Datasets that describe such relationships can be difficult to visualize and to explore, especially when dealing with a large number of entities and relationships.

Storyline visualizations, that became popular with Randall Munroe narrative movie charts in XKCD comics [4], can accommodate such datasets and show the relation among people over time. In these charts, each character is represented by an horizontal line, whose length represents their lifespan in the movie. Lines converge to meet other lines when the characters interact in the movie, and diverge when they move apart. Figure 1 shows an example of this visualization for Episode V, The Empire Strikes Back of the Star Wars.

Figure 1: Storylines narrative chart about Star Wars Episode V, The Empire Strikes Back [2]. Each line is a character and their color represents their alignment: blue lines are in the Light side, red in the Dark side, and grey in other.

However, including contextual information about the geographical locations involved in these relationships can be difficult. We could, for example, treat "locations" as characters and add one line for each location. However, this alternative makes the visualization more complex and requires additional rendering styles to differentiate them from normal characters (e.g., make them wider, use different fonts, ...). Alternatively, we could use a spatial dimension [1] or annotations [5]. Examples can be seen in Figure 2. However, none of these alternatives incorporate contextual geographical references of the places they represent: for example the fact that Tatooine and Geonosis are both plants of the Outer Rim.

The goal of this internship is to design visualization alternatives to include geographical data in Storyline visualizations, that they:

1. Maintain some spatial relations as well as possible [3], even if the map(s) are schematic in nature. In other words, as we don’t focus on detailed geographic information like the streets or rivers, but rather on a simplified map that provides enough spatial information to understand where events happened,
2. Include information about the different administrative levels (cities, regions, countries, continents), either at once or on demand.
3. Connect with the rest of the Storylines visualization or other multidimensional data visible in the interface.
The work of the internship will be divided in three main tasks:

1. Review the literature on thematic maps abstractions and general contextual information in Storylin visualizations.
2. Analyze if some of the alternatives found in the previous point are appropriate to incorporate in Storylines visualizations.
3. Propose new designs in case no good options were found in the literature.
4. Evaluate prototypes of the new designs in a user study.

If possible, the intern can also work on the development and incorporation of the resulting designs in a Storyline visualization tool we are currently developing.

Requirements for Applicants: Knowledge of user evaluation and prototyping methods. Although not strictly required, any past experience in information visualization (design or development) and web development is a big plus.

References


