Of Spheres and SPORES: Propp's Spheres of Actions and Spatial Hypertext-Based Recommender Systems

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ABSTRACT

Vladimir Propp (1895–1970) was a Russian folklorist, who identified what he considered the 31 fundamental actions of major characters and their consequences for a story, actions which he called *functions*. This paper focuses on one specific part of this principle—*spheres of action*—and considers how they might be explored using *SPORE* and its underlying infrastructure *Mother*, a spatial hypertext-based recommender system developed by the authors.

CCS CONCEPTS

• **Human-centered computing** → **Hypertext / hypermedia**; *Information visualization*; *Graphical user interfaces*; Collaborative interaction; • **Applied computing** → **Hypertext / hypermedia creation**; Interactive learning environments; • **Information systems** → **Recommender systems**.

KEYWORDS

hypertext, spatial hypertext, recommender system, linguistics, storytelling, tropes, education, Mother

1 INTRODUCTION

Vladimir Propp (1895–1970) was a Russian folklorist, concerned with the underlying structure of folktales. This scholarship formed part of a wider early 20th century effort to discern patterns in new areas - see also [17] in the folklore space. By mapping the actions of major characters in 100 examples of the form, Propp identified what he considered the 31 fundamental actions of major characters and their consequences for a story, actions which he called *functions* [15] and which he outlined in his 1928 work *Morphology of the Tale*.

Propp's *Morphology* has been of interest to various scholars of interactive digital narrative, both as a framework for analysis [9, 10] and a model for generating stories [12, 14]. Part of the appeal may lie in its apparent inclusiveness, at least as regards Russian folk tales: "The series of functions [...] represents the morphological foundation of fairy tales in general," Propp argues [15]. Despite subsequent claims that these 31 functions may lie "at the heart of all narratives" [6], actual phenomena "turned out to be messier and less easily explained than proponents had hoped" [8]. It is worth noting that the empirically-minded Propp himself distinguished his approach, best suited to comparative study of specific folk tales, from other models that sought to more widely cover "tales throughout the world" [15].

"Computational modellers," wrote Ruth Aylett, "are attracted to structures as this is what computers are good at" [5]. The appeal of

structuralist approaches like those of Propp or Tzvetan Todorov may be traceable to the appealing idea that there can be a discernable formal structure underpinning narrative generation. If all stories are ultimately composed from the same structures, then creative expression becomes simply another modeling challenge. Plug in a few well-chosen prompts and you have a bespoke, personalised story without the messy human element.

Implausible as this claim may appear, with large language models now going mainstream this approach has rarely had such currency; see its prominence messaging around the ongoing Writer's Guild of America strike, for example.

This paper outlines one particular aspect of Propp's approach—*spheres of action*—and explores how it might be applied to *SPORE* [16] and its underlying infrastructure *Mother* [3, 4], a spatial hypertext based recommender system [1, 2] developed by the authors.

2 SPHERES OF ACTIONS

Propp introduces the idea of *spheres of action* in the following way:

> "Although functions, as such, are the subjects of the present study (and not their performers nor the objects dependent upon them), we nevertheless should examine the question of how functions are distributed among the dramatis personae. Before answering this question in detail, one might note that many functions logically join together into certain spheres. These spheres in toto correspond to their respective performers." [15]

Stories, for Propp, are primarily about what characters *do* [7], perhaps reflecting that motivation and intention are less reducible via scholarly intervention than action can be. These functions, these actions, cluster around specific roles, roles that do not have to be embodied in one character. It is quite possible, for example, for the *sphere of action* represented by the villain to include functions performed by a multitude of individual characters within the story. What matters is the function that the villain-type performs in the particular tale.

To explore this further, we can consider one example of a particular *sphere of action*, in this case the aforementioned villain. Propp annotates these spheres in a particular way, with the marks in parentheses pertaining to particular *functions*:

"The sphere of action of the villain. Constituents: villainy (A); a fight or other forms of struggle with the hero (H); pursuit (Pr)."

Here we see that particular functions or actions fall under the jurisdiction of particular entities.

These functions (and the *spheres of action* into which they can be clustered) have been applied to several projects which sought to
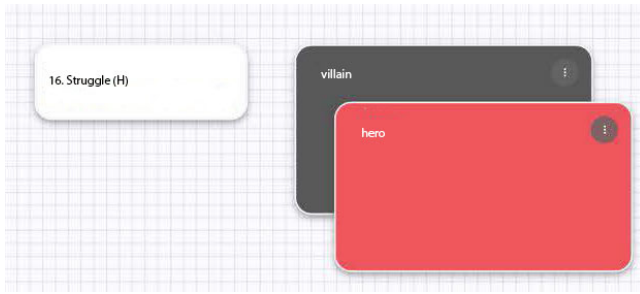

Figure 1: Illustration of villain/hero interaction (mock-up for illustrative purposes)

generate narrative from these fundamental building blocks (see for example [11, 13]) while others have tested their utility for the analysis of other narrative forms. An alternate approach is to explore how these relations might be explored visually, assisting users in understanding the relationships that Propp sought to identify.

Such an exploration should be able to represent (i) the specific spheres of action; (ii) the functions which fall within it; and (iii) how these functions correspond to other spheres and functions.

Spatial hypertext takes care of the former. By representing each domain of action as a node, the associated functions can be visualized as clustering around it. Since many of these functions necessitate another *sphere of action* with which to interact—i.e., a villain cannot struggle without a hero against whom to struggle—an additional node may be generated to represent this other sphere. Better yet, two spheres—hero and villain—can be drawn together, displaying related functions as they are brought into proximity.

It is likely, however, that users will want to see which other functions are available and to which spheres of action they might be connected. The integration of a recommender system allows the suggestion of other potential connections, weighted by their prevalence in the dataset of existing folk tales, borrowable from Propp's *Morphology*.

The rough illustration in Figure 1 shows an example of two spheres of action (villain/hero) and an illustrative function suggested by their interaction.

3 CONCLUSION AND FUTURE WORK

This initial paper outlined in broad strokes the potential value of *SPORE* for the exploration of Propp's *spheres of action.* Its integration

of a recommender system with spatial hypertext allows users to explore Propp's *spheres of action* and the functions they suggest.

In addition to potential pedagogic applications—the teaching of structuralist approaches to folklore, narrative logic—this tool can be integrated into OpenAI and other LLM-based chat systems to generate folktales from these structures. This approach permits users to kinaesthetically manipulate and refine the particular spheres of action before outputting to prose.

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