

# Discursive Navigation of Online News

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## ABSTRACT

As a response to the current navigational format of online news, which is linear, chronological, and heavily delineated by topics, we propose a more discursive and heuristic model of navigation that will offer readers a variety of lenses, interpretations, and pathways to read through a news site. Through an analysis of two prominent discursive models of knowledge—Foucault’s *Discursive Formations* and Deleuze and Guattari’s *Rhizome*—we can determine an organizational framework that is more representative of human memory and associative connections. This discursive framework is put into practice through the interactive and exploratory medium of data visualization, shown in a sketch-based format.

## Author Keywords

Conceptual Metaphor, Data Driven Design

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

Nearly twenty years since news was translated from its paper form to the online environment, its navigational and hierarchical format has remained quite unchanged. Traditional newspapers are organized from headlines to the least important sections, grouped in columns of text, and supported by single images. While this structural and hierarchical format continues to be apparent in online news—despite its ability to stand as its own medium for quite some time now—is slowly proving to be an unnecessary hindrance to the potential for information to be organized in ways that are more representative of human memory and associative connections [8].

Hence, opportunities that digital news affords are yet to be fully explored in how we structure a readers’ navigation through news. Current navigation of news sites is performed through ‘Related Articles’ sections located at the bottom or sides of a chosen article. These related articles

are chosen through similar keywords within the article’s headline. The chronological format of this navigation limits any deviation and true exploration of online news articles, as movement and article connections within these hyperlinks are incrementally slow and taxing. Through analysis of conceptual metaphors built from Michel Foucault’s *Discursive Formations*, and Gilles Deleuze and Felix Guattari’s *Rhizome*, we can derive a framework to restructure current online news formats in ways that allow online news to be deconstructed and re-contextualized, allowing for digressive and profound associations between news articles. This framework will then be further illustrated in a visualization sketch that displays the discursive navigation in terms of interactivity and visual accessibility.

## BACKGROUND & RELATED WORK

In order to move online news beyond its current linear structure, it is important to consider each article as an assemblage of components: author, title, publishing date, geographic location, and a variety of other components. Sentiment analysis in text provides another facet and brings forward the tone or emotions of an article. Through the combinations of sentiment analysis and meta-data extracted from news, we begin to see more ways of making connections between articles—which are no longer limited by keywords alone. The resulting discursive visualization will be able to provide a more constructive and critical view of online news media as most subjective factors that sway an article are brought forth to the viewer.

There is a considerable history of info graphics and data visualization in both physical and digital news media. News services such as The Guardian with their Data Blog<sup>1</sup> or New York Times Infographics<sup>2</sup> have been using visualizations to reinforce traditional reportage.

Our work draws from examples of text works by artists such as Brad Paley’s classic TextArc<sup>3</sup> and sentiment analysis such as *We Feel Fine* by Harris and Kamvar<sup>4</sup>. Because of their ability to use text and other data to explore

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<sup>1</sup> <http://www.guardian.co.uk/news/datablog>

<sup>2</sup> <http://www.smallmeans.com/new-york-times-infographics>

<sup>3</sup> <http://textarc.org>

<sup>4</sup> <http://www.wefeelfine.org>

relationships, these visualizations begin approaching a multidimensional non-linear model for visualization and navigation. However, they lack the intentions to build a network of associations.

Work that is more specific to our intent is Richard Rogers' *Issue Crawler*<sup>5</sup>, and MIT Visible Language Workshop's, *The Galaxy of News*, as introduced by [12]. The *Issue Crawler* uses what Rogers' defines as co-link analysis between a topic description and its origin in the online context by identifying sources relevant to a happening. It attempts to reveal the strength of connections between topics discussed and their context, effectively eliminating sources that provide shallow contributions. This results in a visual network of related sources that define the key contributors within a discussion. Meanwhile, *The Galaxy of News* primarily considers the computational approach to making associations and their representation within a large network of articles. Similar to our work, it attempts to parse out associative relationships found in news media to display a broad map of connections. Our work differs in three important aspects where we consider the grounding of our theoretical work in Digital Humanities, our focus on a new model of navigation and lastly, in our approach to articles as an entry point that eventually reveal further associations.

More thematically related to our model of navigation and its foundations, we consider the work of [9], which uses folksonomies of temporal, geographical, emotional, and experiential narratives to allow users to build co-constructed online biographies. The team uses the concept of the Rhizome to inform a structure that privileges the building of heterogeneous, and overlapping connections between personal experiences. In addition, [10] builds conceptual relationships between content by tracking the paths a user takes through online content. Multiple views of data are offered by [1] a framework for various visualizations of data through a standard web browser. From this work we can see that the foundation for exploration is found not necessarily in the cohesion of content; but rather the fragmented, heterogeneous, organic connections between content. The main problem with these works is that the content and connections are either entirely user generated or the views remain one-dimensional.

### CONCEPTUAL METAPHORS

Hence, we present two conceptual models of knowledge: Foucault's Discursive Formations, and Deleuze and Guattari's Rhizome, which are dominant themes within new media and Digital Humanities. We do not consider these models as a direct application to our problem; instead we use them to inform conceptual metaphors that in turn can be used in the development of user interactions. Conceptual metaphors are what can be defined as abstract metaphors where an idea—already rich with metaphors and

concepts—is applied to imagine creative systems or critique existing ones [7]. We explain two key concepts that inform the design of a discursive navigation model: Discursive Formations and the Rhizome.

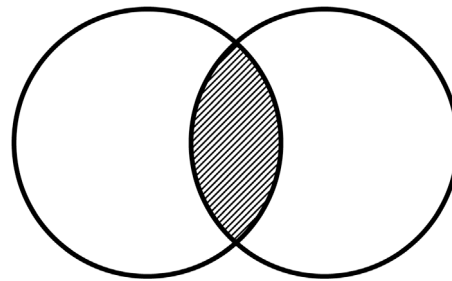


Figure 1. Illustration of Foucault's *Discursive Formations* similar to the model of a Venn diagram.

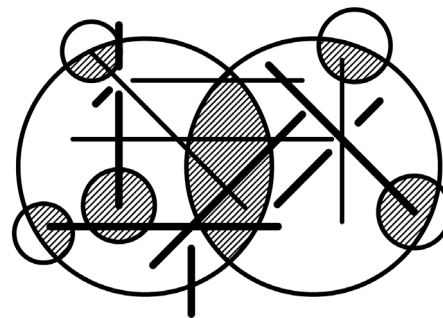


Figure 2. A rhizomatic model of navigation considers all of the possible relations between articles and builds connections from each article to other articles.

### Discursive Formations

Events and topics have multiple dimensions, opinions, causations, and impacts. They can span a variety of disciplines and relate temporally and conceptually to other information. In despite of this fact, raw content passes through a sequence of filters, which shape a once rich network of ideas into the one-dimensional articles portrayed in news [6]. Each article is isolated further by its placement into categories such as *Arts*, *Politics*, and others.

Every topic or branch of knowledge contains concepts, language, and themes, which define the boundaries of a specific topic [4]. These boundaries define what Foucault refers to as *discourse*, and each discourse defines the way in which a topic can be discussed [5]. When discourses overlap (and there is regularity between statements), this creates a *Discursive Formation* [4] (see Figure 1). The important aspect to consider from this idea is that discourse is plural; it does not consist of one statement, text, or source [5]. Discursive Formations provide a model for thinking about relations found within the text of articles—based on a

<sup>5</sup> [http://www.govcom.org/scenarios\\_use.html](http://www.govcom.org/scenarios_use.html)

consistency between statements instead of keywords—that reduce a document down to one or more themes.

An example of these boundaries is found in WordNet<sup>6</sup>, a lexical database of the English language, but the database is limited by the way it structures language. An example of this problem is how in searching the term *genetics* results in relations only based within the natural sciences. Genetics is a word infused with, history, ethics, and politics, which are not reflected in WordNet’s model of knowledge. A way to bridge two terms may be found through grouping both related and unrelated boundary objects found within articles (e.g. Genetics, Birthrate, Ecology).

### The Rhizome

We define the column types, which categorize articles, as contexts. Navigating between these contexts through articles is difficult as each article is explicitly defined by its column type and keywords. The separation of these contexts defines the paths a reader can take through content.

Therefore we find it relevant to include more abstract techniques for finding relations. The abstract techniques can range from making connections between articles based on similarity or dissimilarity among images, writing location, or sentiment. These data types can be passed through various types of processing, geo-location, image analysis, sentiment analysis, and natural language processing, and return qualitative associations between multiple articles. This can be used to build more abstract relations between articles that were not present before.

Our final conceptual foundation attempts to describe the space in which discourses meet—the underlying mechanisms at work in Foucault’s *Discursive Formations*. We use Gilles Deleuze and Felix Guattari’s concept of the *Rhizome* (see Figure 2). Deleuze and Guattari use the rhizome<sup>7</sup> as a conceptual tool for characterizing their model of knowledge. Discourse in this respect is rhizomatic, meaning that it is non-hierarchical, shapeless, and comprised of further dimensions, which are in as well Rhizomes. To complicate things further, a discourse is itself but one dimension of a larger Rhizome. There are other properties of a Rhizome that are important to consider for a model of navigation; any point can connect to any other point irrespective of their commensurability or concomitance. It has no origin, no beginning nor end, and consists of multiple entries and exit points. A real world example of this pattern of navigation can be found in Wikipedia, whereby user defined hyperlinks embedded in wiki pages can connect to any other wiki page. Following this rhizomatic model we treat each article and its metadata

<sup>6</sup> <http://wordnet.princeton.edu>

<sup>7</sup> A continuously growing horizontal underground stem which puts out lateral shoots and adventitious roots at intervals. <http://www.oxforddictionaries.com>

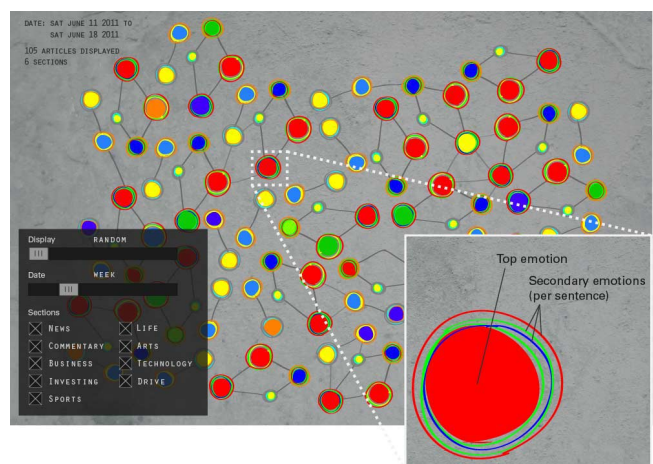
as non-sequential, undefined, points in a shapeless non-hierarchical network. Any article is the entry point and the exit point to the news [2]. Through this nonlinear progression a user is introduced to content associated through semantic and subjective relations.

### METHODOLOGY

Through a charrette-based design process, we combined conceptual metaphors and manual data analysis of available online article meta-data and sentiments to ideate our visualization. Strongly informed by Discursive Formations and rhizomatic models, we used the derived framework as the underlying model for content organization, able to accommodate an interactive navigation of articles. We defined our set of variable types by what is commonly used within online news API. Through user customization of variables ranging from publishing date, author, geographic location, and/or section, we can make digressive, novel and qualitative associations from one context to another. It is imperative that the sketch must allow deconstruction, linking of variable contexts, and multiple navigation entries and exits in order to achieve the desired level of discursive navigation.

### Sketch: Cell Chamber

Inspired by the aforementioned models of Discursive Formations and the Rhizome we set out to sketch an exploratory interface specifically based upon the navigation of news media. To reiterate, Discursive Formations are the result of the overlap and regularity between discourses [4]. A discourse is plural and does not consist of one statement, text, or source. This idea is reflected in how we aggregate and relate data through this sketch. To compliment the associations we use the concept of the Rhizome to structure the connections between nodes; namely the Rhizomes ability and nature to make both concrete and abstract associative connections.



**Figure 4.** This sketch version features a network structure of nodes connected by section. Users can customize the display using the panel in the lower left corner. The arbitrary colours of each node represent the dominant emotions found within the article.

Cell Chamber is comprised of news articles, which represent a single node. We refer to nodes as cells as each article represents an organic assemblage of concepts, interviews, imagery, and captions—components that together compose the entire story. Each cell has the ability to connect to any other cell in the network through heterogeneous connections built from the data that each article contains [2]. Cell Chamber can provide an overall view of the article network or offer the user a single article as a starting point, which expands to more related articles as the user navigates based on relationships alone.

Clicking on each cell expands into secondary rings that surround the article. The smaller rings signify each sentence in the article and how it adds up to the overall emotion of an article. Clicking on any of these rings shows the associated metadata from the article, such as writing location, connections, geospatial, keywords, and emotional score. Making this data visible offers a reader a critical analysis of an article and its authors who contribute to the overall stance of an article.

Similar to Foucault's concept of Discursive Formations, Cell Chamber provides the opportunity to aggregate the articles based on various data types like topic, language consistency, emotional score, author, or writing location. For example, a reader may navigate based upon the writing location of the article. Such a view will reveal patterns that may emerge among author groups who are closer in a physical network. Article locations will also paint a better picture of the environmental factors and events surrounding the author at the time of writing. This brings the user closer to the origin point of the article, allowing for personal curiosity to take over the interpretation of the article and the factors surrounding it. Cells may also be aggregated based on time, positioning article relations on a scale of weeks or months. In this view, Cell Chamber illustrates how articles connect over time, providing a user with a view of how stories or trends unfold.

Cell Chamber offers navigation between articles from different contexts. The organic nature of the visualization allows users to flow from one context to another, as cells are connected through different parameters that contrast the typical connections of related articles often established through keywords alone.

## CONCLUSION

By distilling conceptual metaphors from Foucault's Discursive Formations and Deleuze and Guattari's Rhizome we attempt to illustrate the value of a discursive navigation system of online news. Discursive Formations allow us to

think of articles as plural objects that contain a variety of reference points brought together in an assemblage. Articles can be deconstructed and reconfigured into a visualization that can reveal the underlying structures of knowledge [3]. The Rhizome constructs our network of associations connecting articles to every other article in the network through abstract and non-hierarchical connections. Through these models we shift our view of news as a linear, one-dimensional schema of articles to the idea that news and its component articles can be thought of as an aggregate of abstract data—relatable through even the most fragmented and abstract concepts.

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