

Mapping Spatial Narratives from Digital Text

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While maps and images have been the primary sources of geographic information, text documents which record spatial narratives have mostly overlooked. A narrative is a meaningful sequence of events that tell a story of what happened, how it happened, and how it related to others in a context. Spatial narratives constitute events in space and time. The ability to map spatial narratives from digital text not only opens a rich source of geographic information but also allows us to visualize how events propagate and interact in space and time, to integrate events from text into conventional spatial databases, and to cross reference spatial narratives from documents in a common spatial and temporal framework.

To this end, we have been developing a narrative GIS to extract events from text documents, sequence events to form narratives, and create a spatial database for event data management. We assume that each action verb or action noun corresponds to an atomic event. We developed algorithms to extract atomic events and determine the spatial and temporal reference of every event by context analysis. These atomic events serve as building blocks to build spatial narratives. Mapping spatial narratives can visualize event sequences and discover relationships among narratives in space and time.

Our case study built upon two sets of open source documents: *the Richmond Daily Dispatch* and *Dyer's Compendium of the War of the Rebellion* during the civil war. The *Richmond Daily Dispatch* articles provided updates of events in Richmond, the state of Virginia, and Confederacy at large, and news about movers and shakers of the Confederate government and military during the civil war. *Dyer's Compendium* concisely lists regiment movements and battles in every state from April 12, 1861 to May 6, 1866. The case study is used as a proof of concept for mapping spatial narratives from digital text.

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