# **Generating Meaningful Representations from Multimodal Spatial Data Describing Human-Environmental Interactions**

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## Introduction





Challenge #1. Diverse spatial resolution coverage and data format Challenge #2. Incorporation of multiple relations

### **One Line of Work on Capturing Multiple Relations** Understanding Complex Spatial Document





AIN U L S Babbitt A S Marcell

> Post Route Map of the State of Minnesota Showing Post Offices **David Rumsey Map Collection**



**Comprasion between semi-structured document** and complex spatial document

#### Definition of Multiple Relations on Text Labels

- Text relations semantic meaning and word order within the location phrase
- Semantic type relations relationship between **semantic types** of multiple location phrases——
- 'RED LAKE' (County) Visual relations - visual font style (e.g., height, font family) of the location phrase ------'Red Lake River' (River)
- Spatial relations relative positions and orientation of words within the location phrase



{location-phrase : "ITASCA" type : "county" bbox-coord: [[x1, y1],[x2, y2]...[xn, yn]]} {location-phrase : "Big Fork River" type : "river" bbox-coord: [[x1, y1],[x2, y2]...[xn, yn]]} {location-phrase : "SAINT LOUIS" type : "county" bbox-coord: [[x1, y1],[x2, y2]...[xn, yn]]}



'beach' 'lake' and 'park'







