

Visualizing Jane Addams: Interactive Archives Through AI

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INTRODUCTION

The Jane Addams Papers Project at Ramapo College contains over 55,000 transcribed documents chronicling the life and work of pioneering social reformer Jane Addams (1860-1935). Despite this rich collection, researchers face challenges navigating the volume of documents, understanding connections between people in Addams' network, and tracking thematic evolution in her work.

Our project created three interactive tools to address these challenges: a network visualization mapping Addams' social relationships, a topics-over-time visualization tracking thematic evolution, and an LLM-powered query interface enabling natural language exploration of the archive. These tools integrate directly with the Jane Addams Digital Edition, enhancing its value as a resource for both scholars and the general public.

RESEARCH QUESTION

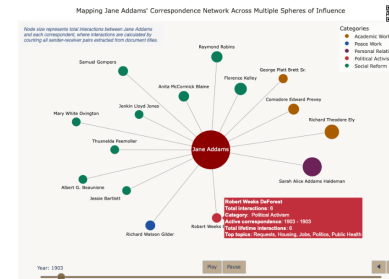
How can interactive visualization and AI-assisted exploration tools enhance researchers' ability to discover patterns, relationships, and insights within the Jane Addams Digital Edition that might otherwise remain hidden in this extensive historical archive?

- How did Jane Addams' social and professional networks evolve over time (1901-1935)?
- What visualization approaches most effectively reveal the changing structure of Progressive Era reform networks?
- How can natural language processing make historical archives more accessible to researchers without specialized technical knowledge?

METHODS

Network Visualization

- Data Prep: Analyzed document titles to extract sender-receiver pairs and standardize name variations for consistency
- Network Modeling: Implemented a bidirectional model in Plotly that categorized relationships into five types: Peace Work, Social Reform, etc.
- Visualization Setup: Developed an interactive interface with node size to represent interaction frequency and color to indicate categories, enabling temporal filtering from 1901 to 1935.



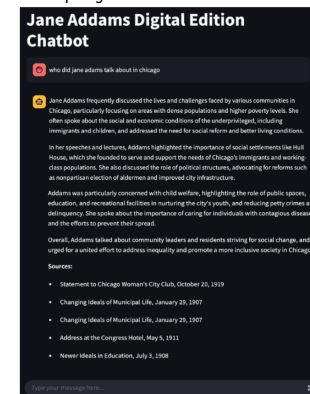
Topics over Time Visualization

- Data Extraction: Extracted thematic metadata from document tags and standardized terms.
- Data Aggregation: Grouped tags by year to determine frequency trends and identify thematic shifts.
- Visualization Implementation: Utilized Plotly and Dash to construct an interactive timeline that supports tag selection, temporal exploration, and hover data display.



LLM Query Interface

- Document Preparation: Generated vector embeddings for over 7,000 documents using OpenAI's embedding models and cleaned texts with BeautifulSoup.
- Semantic Search: Used FAISS for efficient similarity searches, mapping natural language queries to relevant documents.
- Integration: Integrated LangChain for generating conversational responses, enhancing user interaction via a frontend application.



RESULTS

The project elevated the Jane Addams Digital Edition by introducing tools for enhanced archive interaction. The network visualization illuminated social and professional relationships, while the topics-over-time tool traced thematic shifts aligned with historical events. The LLM query interface enabled intuitive access, collectively transforming the archive into a dynamic and accessible resource. The client was satisfied with the results.

CONCLUSION

The integration of interactive visualization and AI within the Jane Addams Digital Edition significantly enhances researchers' ability to explore and understand this monumental collection. These tools transform vast historical archives from static documents into dynamic resources that highlight social connections, thematic evolutions, and accessible content. The project not only makes Jane Addams' work more accessible but also sets a precedent for future digital humanities initiatives to employ similar methodologies.

FUTURE WORK

Network Visualization Enhancements:

- Incorporate multi-level analysis to explore connections between figures in Addams' network.
- Add geographic data overlays to show the spatial reach of her influence.

Topics-Over-Time Visualization:

- Implement sentiment analysis to explore emotional shifts in Addams' writings.
- Add thematic correlations to examine interconnected ideas in her work.

LLM Query Interface:

- Explore cost-effective AI models to increase the scale of indexed documents.
- Add a web search tool integrated within the LLM to allow for more real time knowledge sharing and more accurate results.

ACKNOWLEDGMENTS

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