Pushing Open Science Chain Visualization to The "Edge"

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Abstract

- **Open Science Chain** is a decentralized platform that helps researches share reliable scientific data and code by maintaining a verifiable record of provenance for traceability
- I developed a **graph-based visualization to map relationships** between artifacts' connections more clearly
- The **interactive graph** is embedded within each artifact page, allowing users to:
    - Explore the artifact in context
    - Navigate connections to related artifacts

Introduction

- Previous webpage for artifacts on Open Science Chain web portal displayed **artifact details in isolation**
- As an improvement we proposed an **interactive graph augmented** with the artifact page
- Aimed at giving user a clearer view of the broader research ecosystem surrounding the artifact

Methods

- Used the vis.js JavaScript library to render interactive graph of nodes
- Set up API endpoints on Python Flask backend
- Queried and managed artifacts using PostgreSQL database
- Designed specifications to define connection and backend logic

Summary

- The initial graph showed connections, but they were mostly arbitrary and lacked meaning
- As more nodes were added, I reworked the clunky backend for scalability and optimizing data table lookups
- Overtime I also realized that I needed to shift my mindset to the perspective of the user and make the design more intuitive. This came in the form of adding legends, differentiating edge types, and clustering nodes to simplify navigation
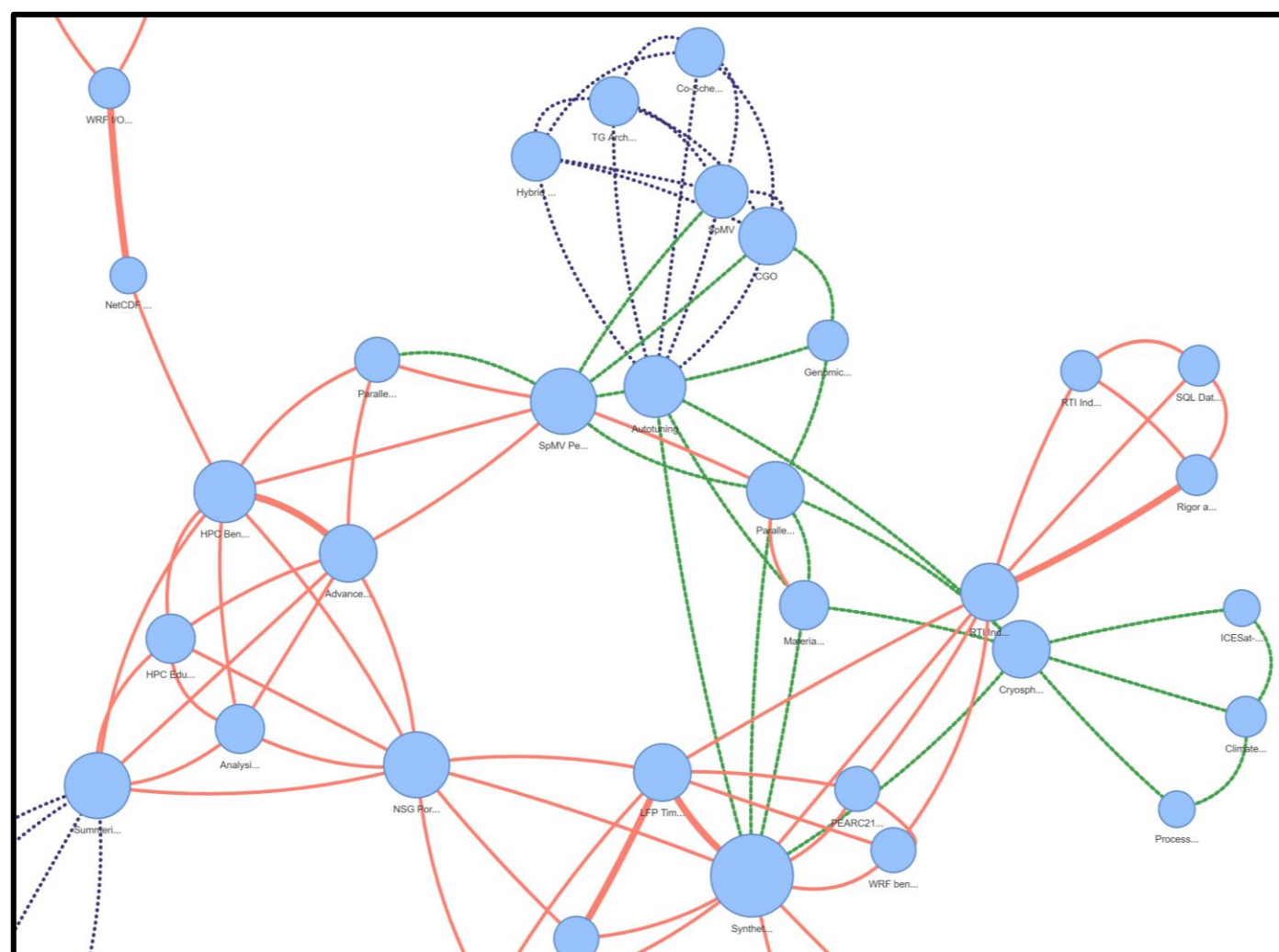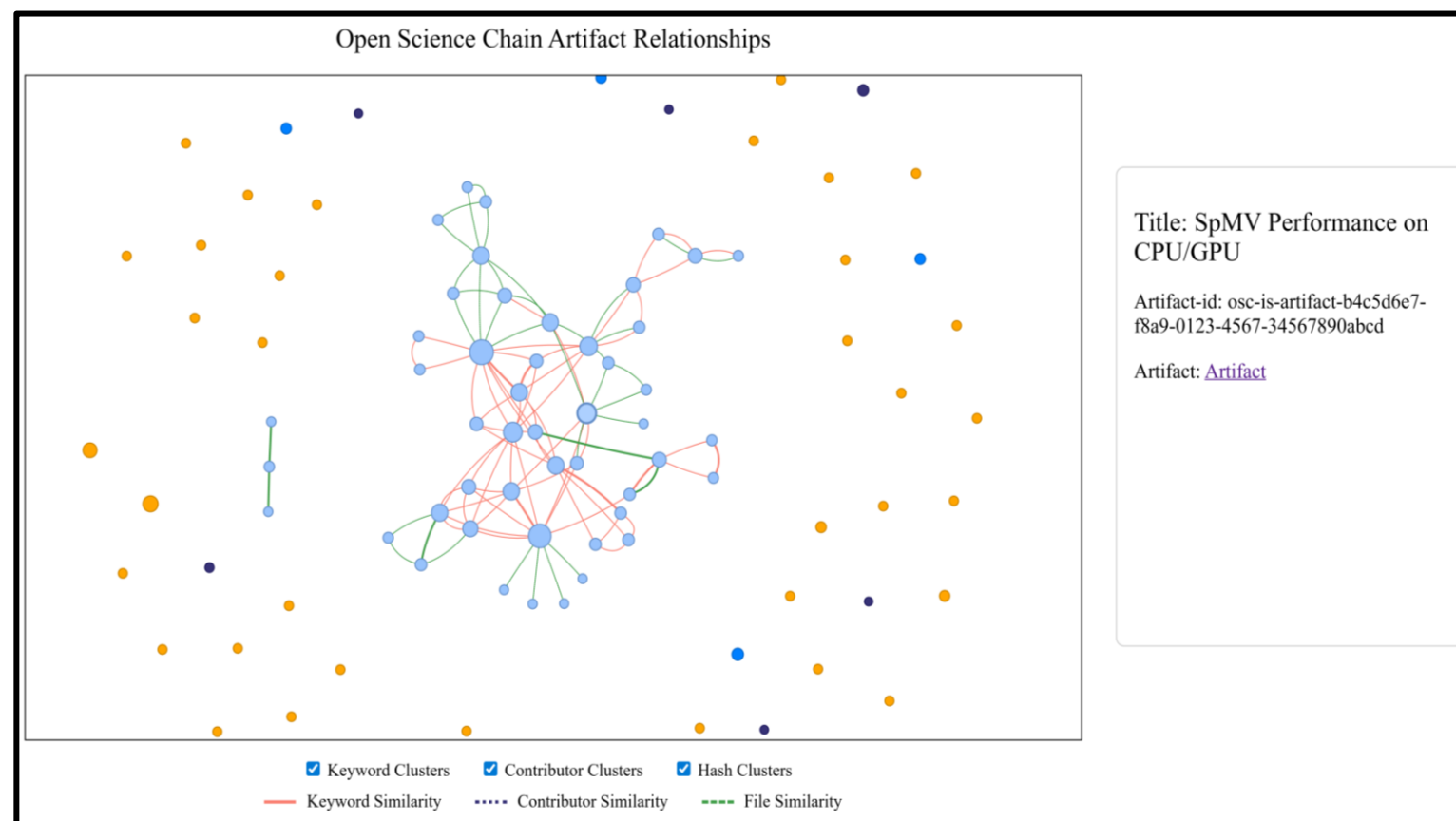
Nodes Can Be Clicked On To Reveal Basic Artifact Information
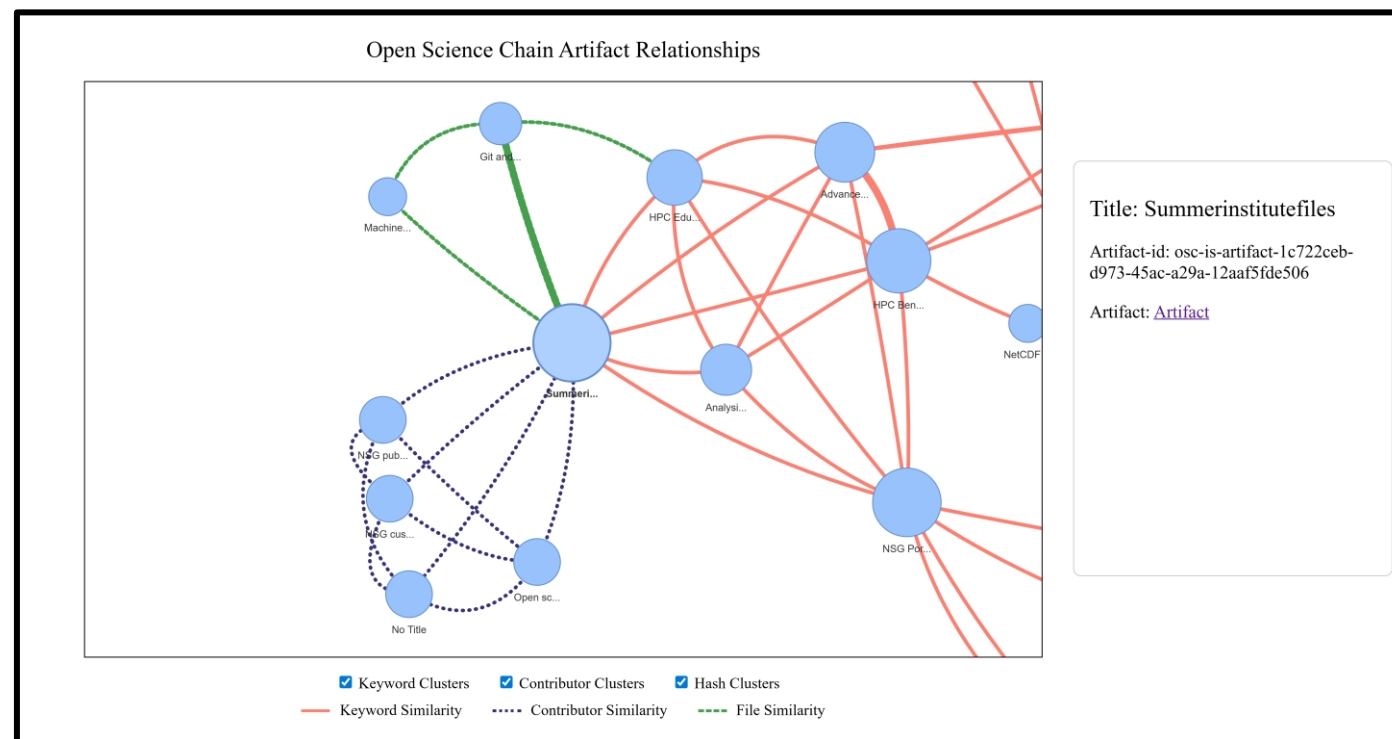
Edges Can Be Clicked To Reveal Similarity Between Artifacts
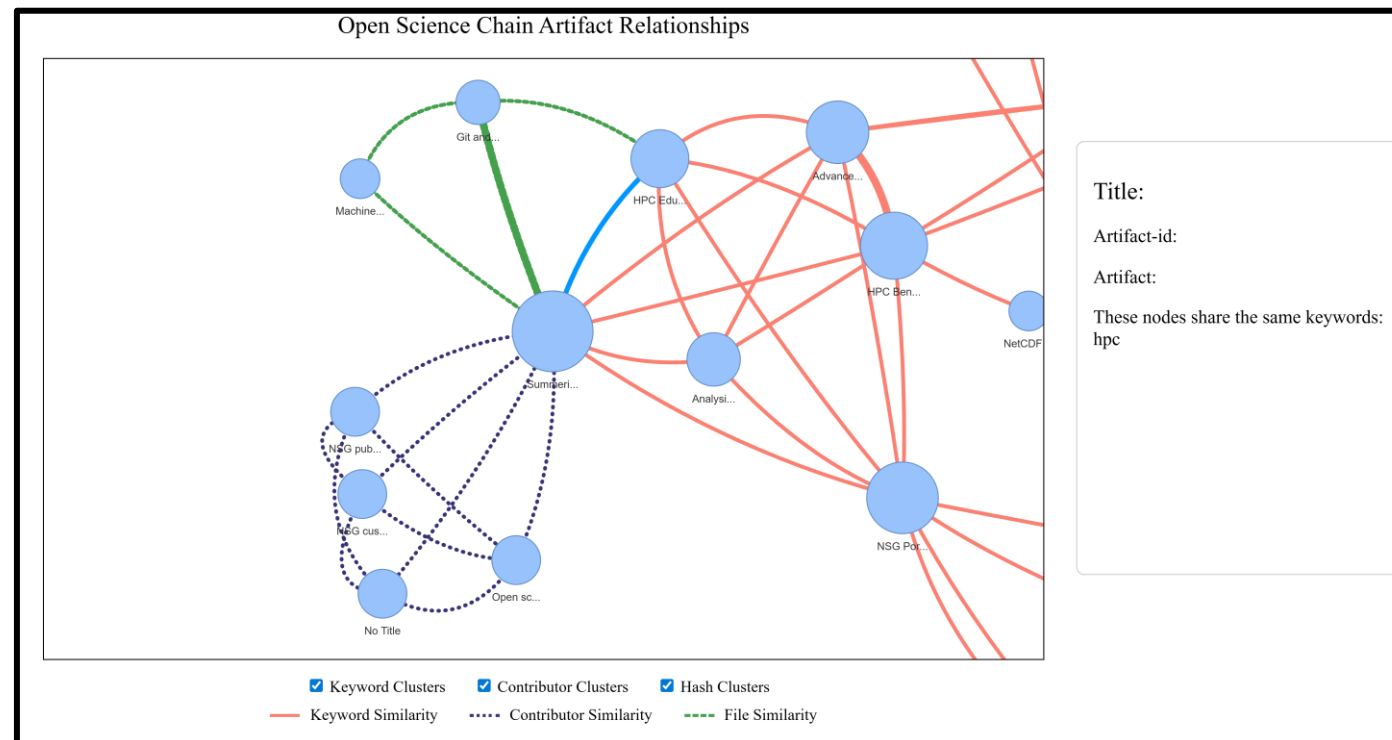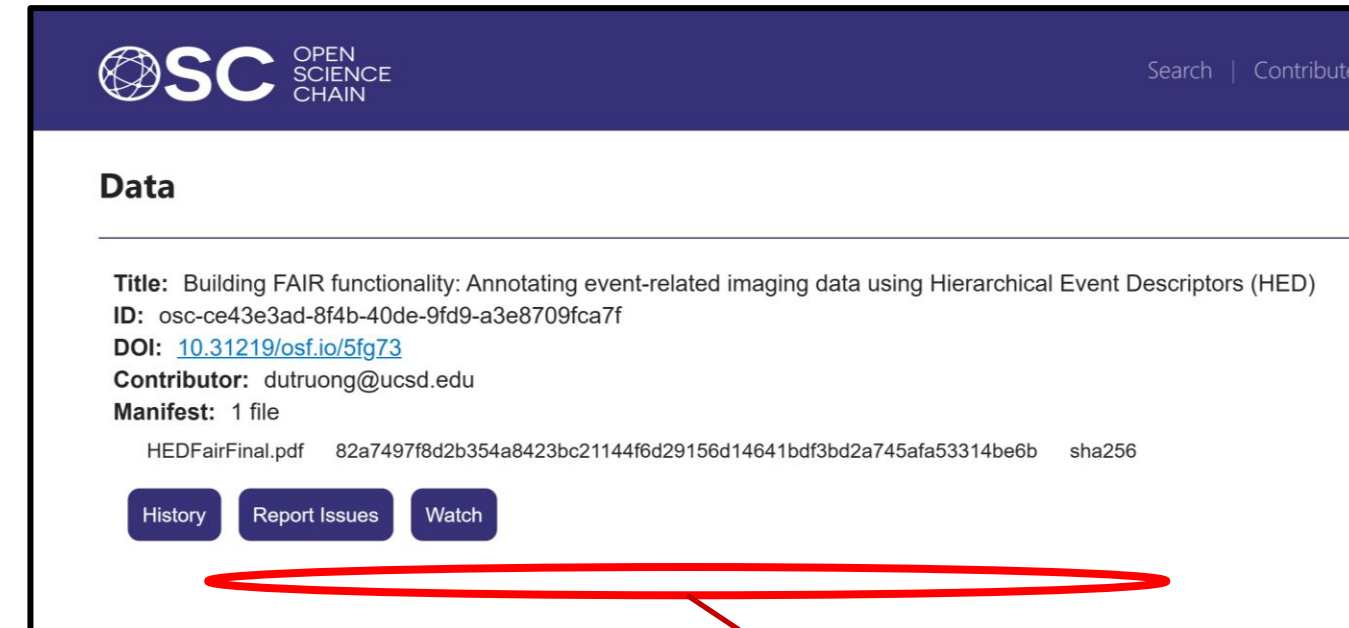

All Artifact Relationships

Next Steps

- Creating relationships with workflows
- Cleaning up the UI
- Delving more into backend optimization

References

- https://flask.palletsprojects.com/en/stable/
- https://visjs.github.io/vis-network/docs/network/
- https://opensciencechain.org/
- https://graphaware.com/glossary/graph-visualization/

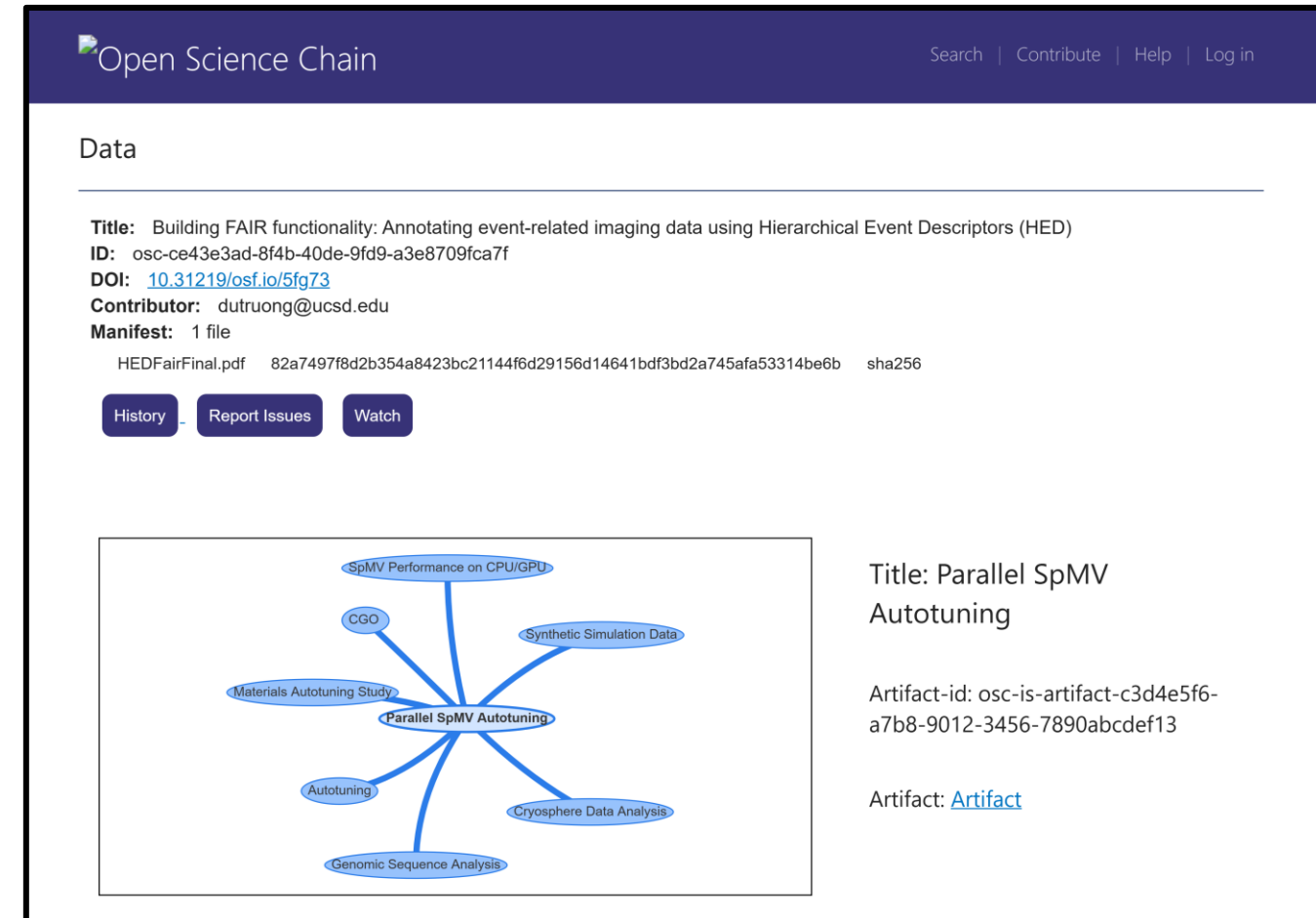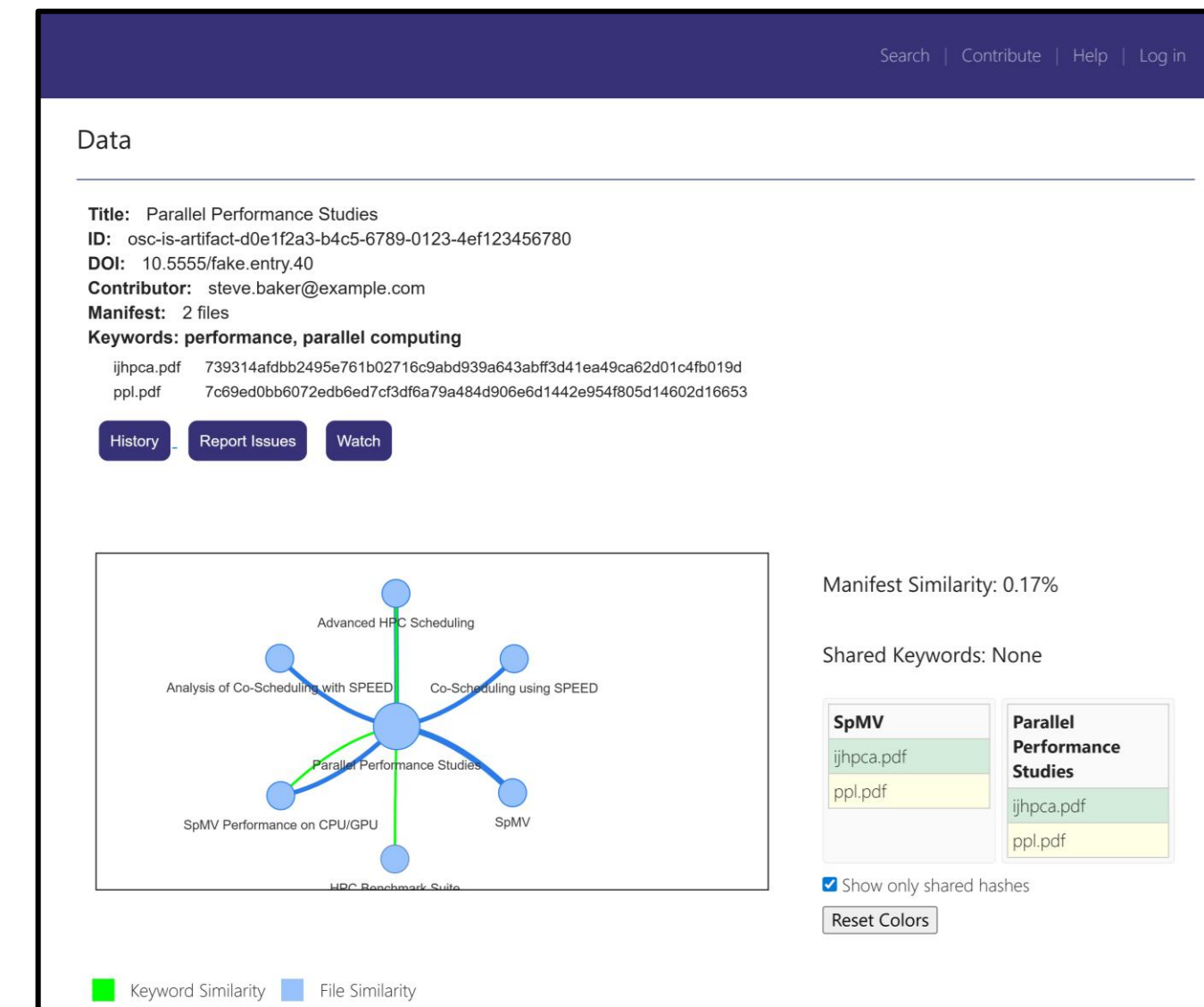## Original Open Science Chain Artifact Page

Wouldn't it be nice to see some of the relationships that this artifact has in a broader context?

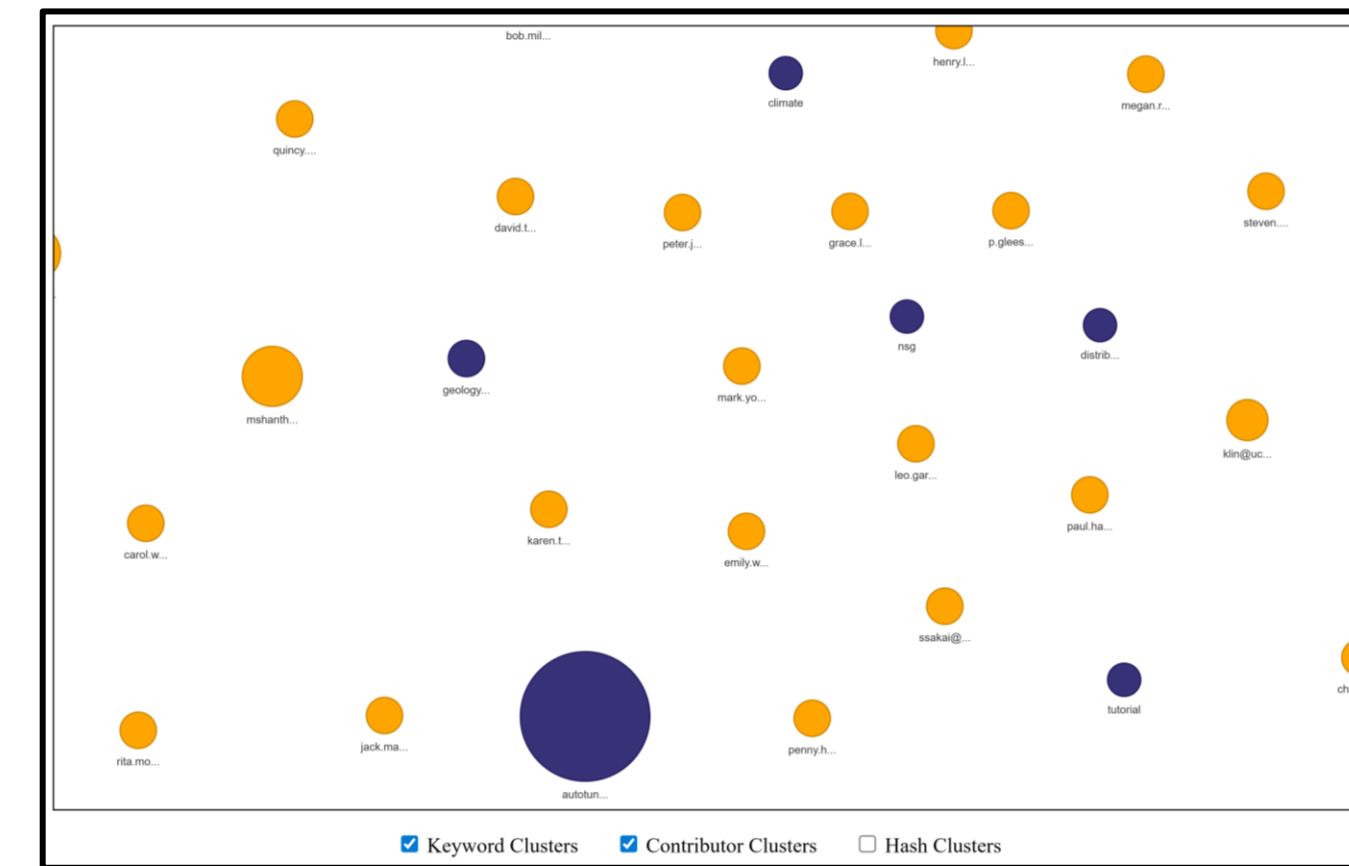## First Version Modeling Shared Hashes

Adding Other Connections (Keywords, Contributors)

Creating a Full Artifact View With Clusters

New Open Science Chain Artifact page