

Problem

Researchers in the field of environmental science require academic search engines as tools while conducting investigations.

Examples of Academic Search Engines:

- Semantic Scholar
- Academia.edu
- Springer

Limitations: The current implementations involve search engines for general terms, and are not specific to Environmental Science. Therefore, researchers in the field of environmental science need a web application that provides domain-bound specific results.

Current System

EnvoScholar v3.0 is an academic search engine in the field of environmental science which contains newly added features:

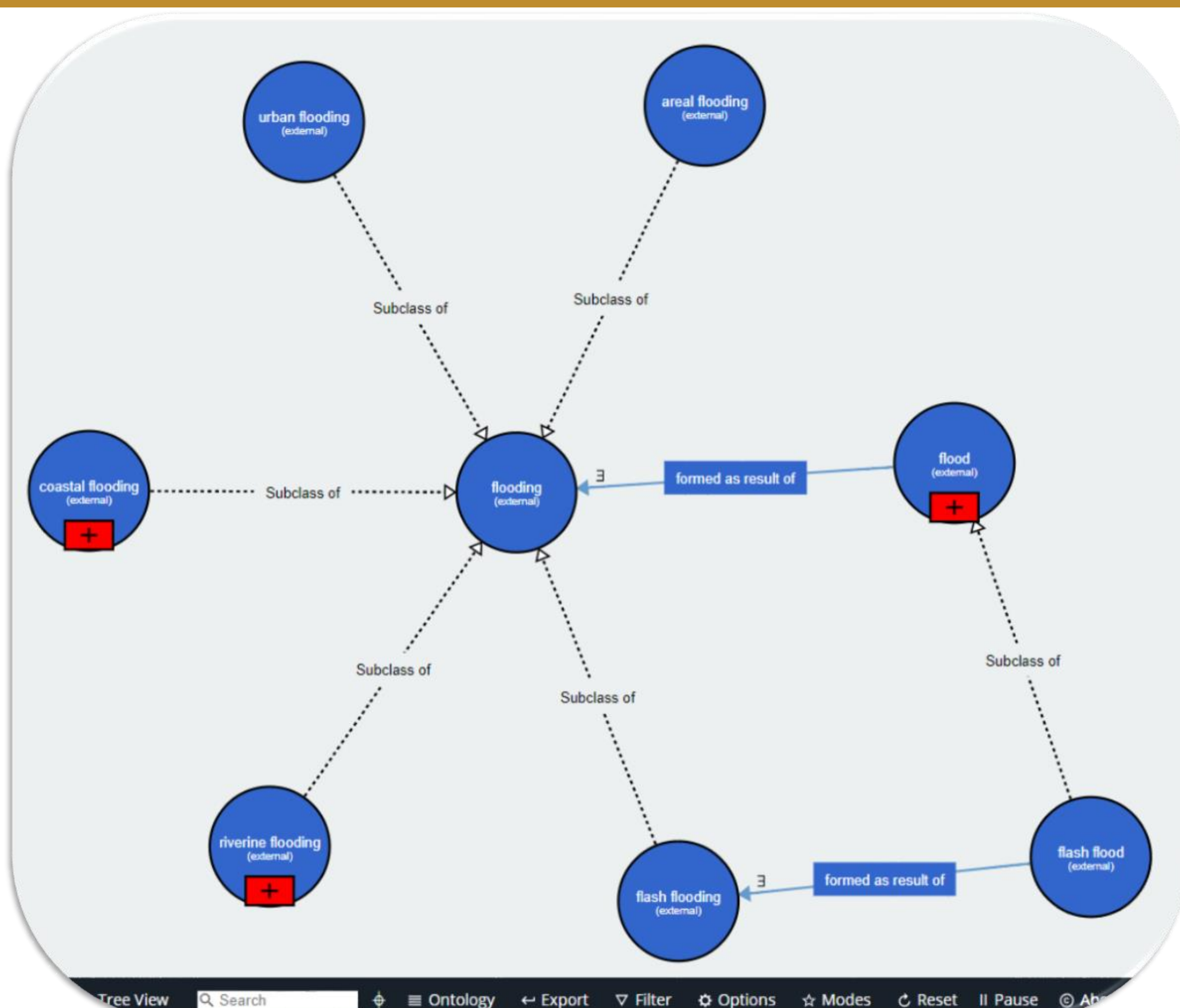
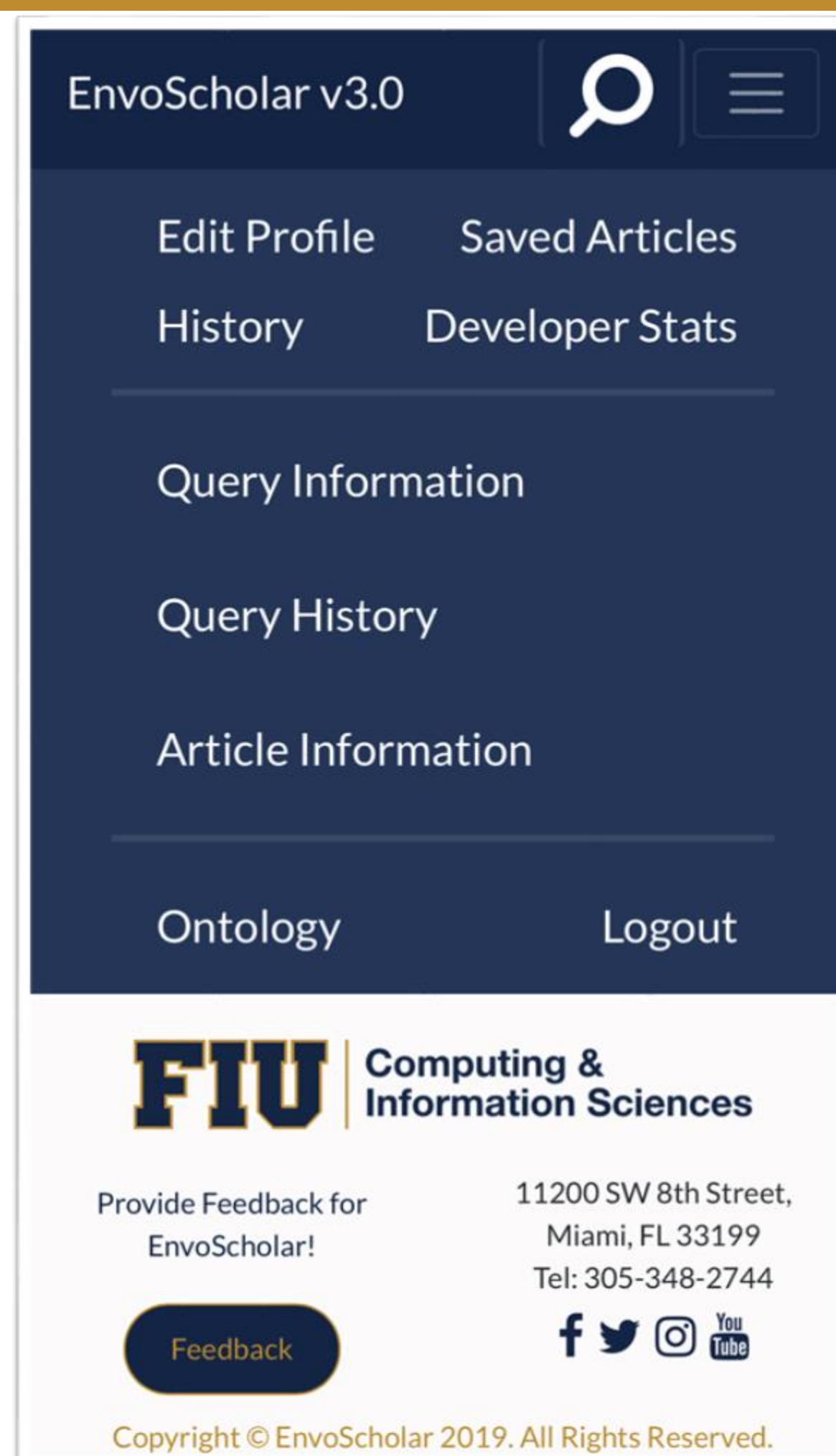
- Complete **server-side** processing and filtering of search results.
- Developer Statistics** that leverage user-based results.
- Dynamic and User-Friendly **Ontology** Visualization that is Searchable and Expandable.
- Improved **Mobile** experience in major components.
- Overhauled User Profile capabilities.

Requirements

Overall, the UI must be web-based, cross-browser, cross-platform, and interactive for researchers. My specific contributions involved implementing the following:

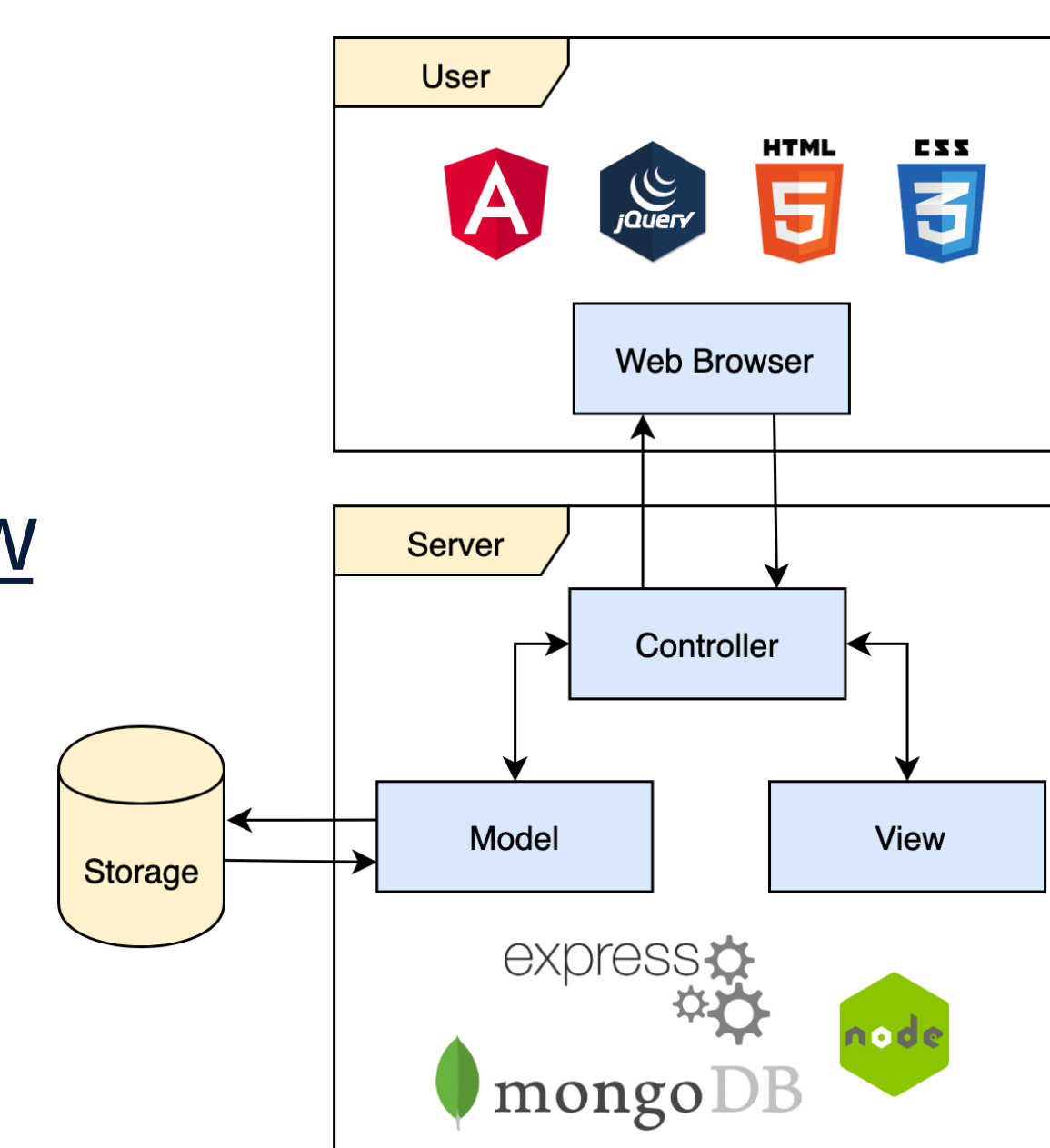
- Server-side loading and pagination** of all search results.
- Dynamic **Ontological** Node Graph Visualization showing relationships using Breadth-First Search Algorithm.
- Exportable **Statistics** useful for future Search Engine Optimization (SEO).
- Mobile** Experience improved all-around.
- Live **Website Deployment** and optimized deployment configuration.

Screenshots



System Design

Client-Server and Model View Controller (MVC)



Implementation

- The server-side result loading and filtering leverages NodeJS and Express and remains connected to the MongoDB Database.
- The MongoDB database now communicates with the display results page via the Express API to store Developer Statistics.
- The interactive node visualization was created by heavily modifying an existing open-source project named WebVOWL.

Enhanced Mobile Experience



Scan to use
Website

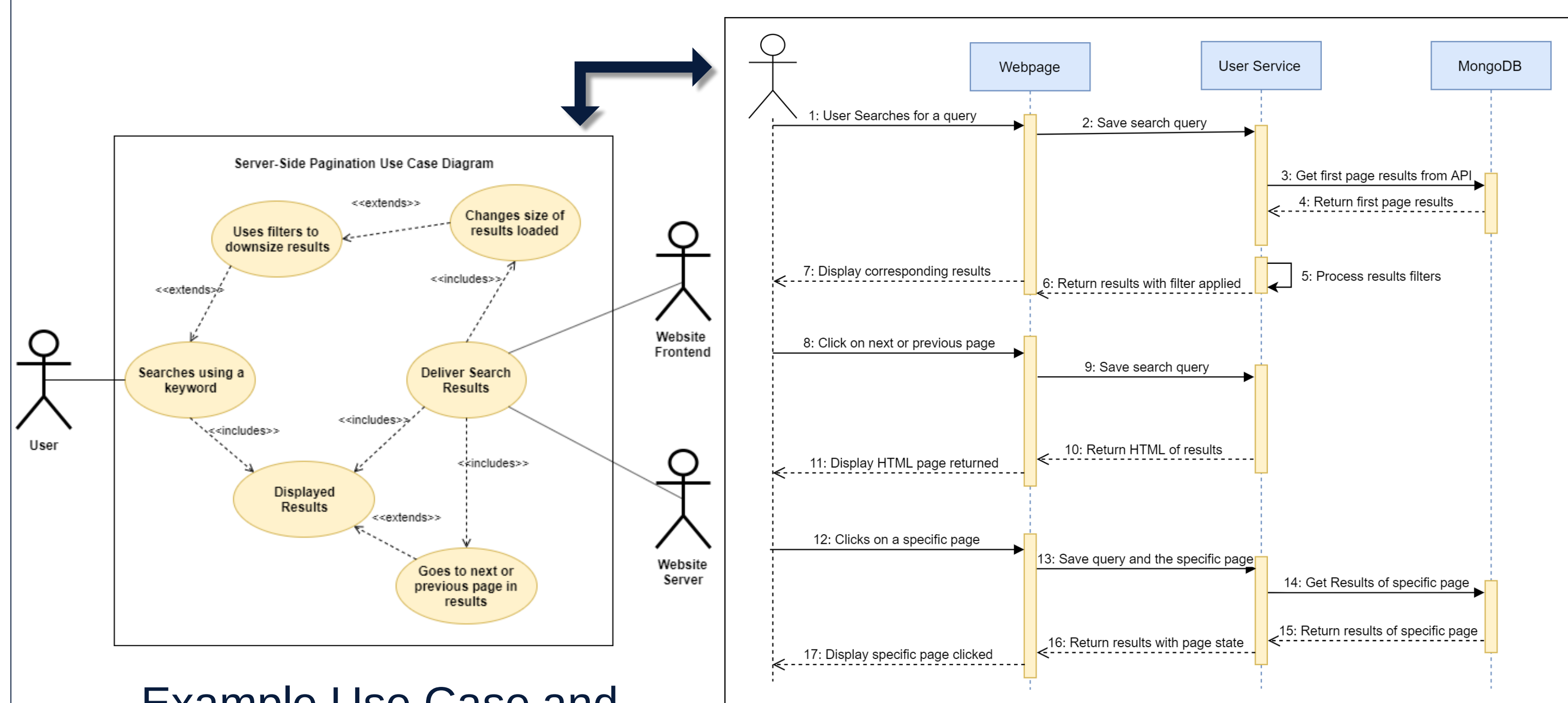
Interactive Node Graph Visualization

Export Table as CSV			
Query Name	Amount of Query Searches	Amount of Article Clicks	Amount of Relevant Articles
drugs	176	13	12
water	99	17	56
immaterial entity	39	3	6

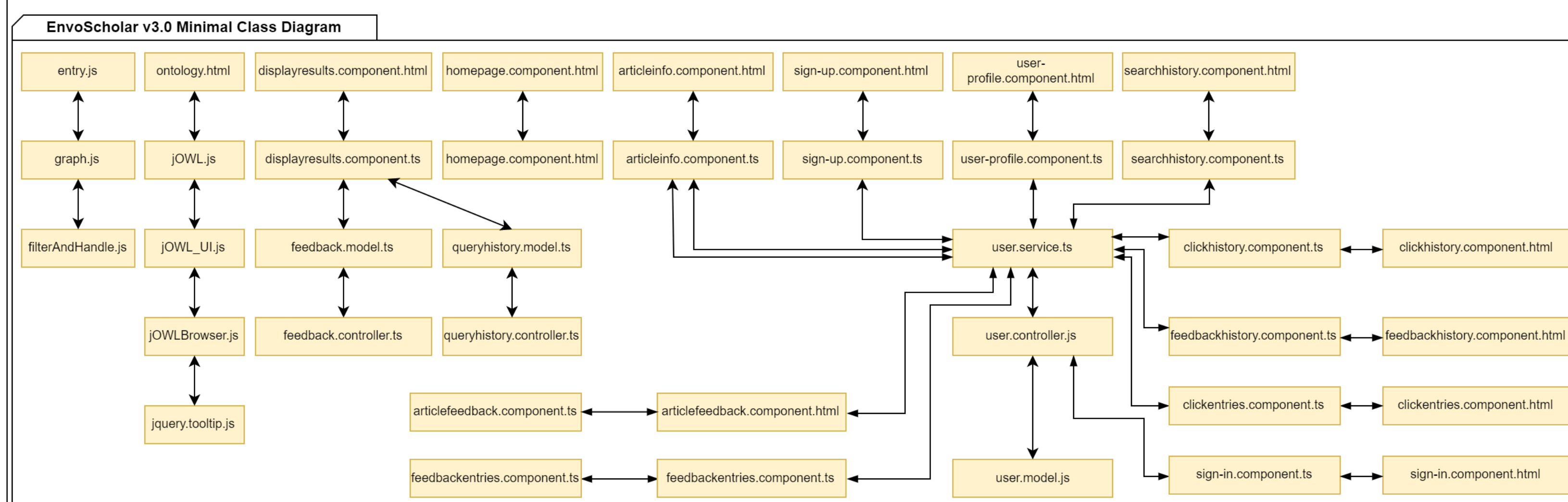
Website Deployment and Configuration

Exportable Aggregated Statistics for Search Engine Optimization.

Object Design



Example Use Case and Sequence Diagrams for Server-Side Pagination



Updated class diagram depicting new abstracted structure of all models, views, and controllers in the system and their interactions

Acknowledgements

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