

**LUMI:**  
Legal Understanding and Matching through Interactive Highlighting

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# Transparency in legal search: LUMI highlights what matters most.

**Problem:**  
Transformer-based models excel in retrieval but lack explainability.

**Solution:**  
Dynamic span highlighting to explain document relevance, bridging the gap between black-box retrieval and user understanding.

**Key Features**

- **Dynamic Query Highlighting:** Select a query span to reveal the most relevant parts of retrieved documents.
- **Explainability at Scale:** Use different transformer models for sentence similarity and relevance scoring.
- **Interactive Interface:** Intuitive UI for non-programmers to explore retrieval results.

**Retrieval Process:**

- Embeddings from SBERT models are normalized to unit vectors.
- Dot product similarity is computed between the query and document embeddings.
- Similarity scores are scaled using min-max normalization for better interpretation.
- Documents exceeding a predefined similarity threshold are selected as relevant candidates.

**Highlighting Method:**

- Users specify a query span.
- The system searches the document for the substring most similar to the query span.
- The most relevant substring is highlighted, along with its similarity score.

**Implementation:**

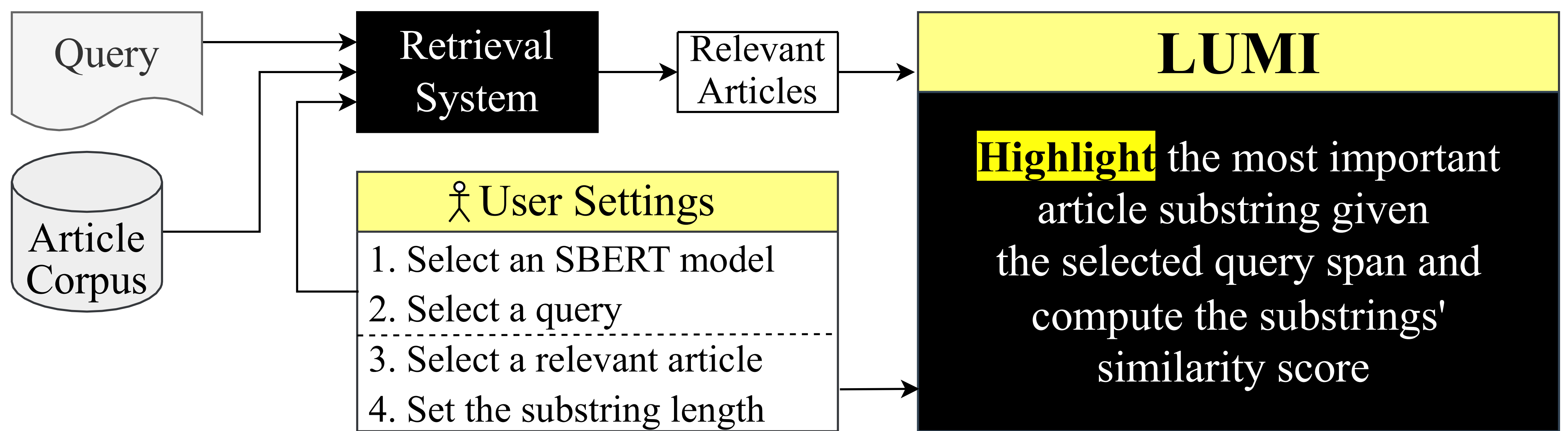
- Backend: Python Flask.
- Frontend: JavaScript.

**Use Case**

- Demonstrated on Japanese civil law retrieval (COLIEE Task 3 dataset).

**Applications**

- **Legal Information Retrieval:** Simplify document review and reduce false negatives.
- **Technical Data Analysis:** Enhance clarity in document relevance assessment.
- **Explainable AI (XAI):** Build user trust in retrieval systems.



Welcome to LUMI

Select SBERT model : BGE-M3(Collee Finetuned) Select query pair : H27-11-E H27-11-E

Query Text :

In cases where dominant land is co-owned by more than one person, if there is an interruption of prescription in favour of one co-owner, such interruption shall also be effective for the benefit of other co-owners.

Select article : article292 article292 Adjust article substring length: 16

Dot Product Similarity between query and selected article : 0.88

Article Text :

Article 292 If dominant land is co-owned by more than one person, and expiry of prescription period is postponed or prescription period is renewed in favor of one co-owner, the postponement of expiry of prescription period or the renewal of prescription period is also effective for the benefit of other co-owners. (Extinctive Prescription of Servitudes) Chapter VI Servitudes

Dot product similarity score between selected query text and the highlighted article text: 0.77

Show Retrieval Details

