IT5712 PROJECT I

From Facts to Verdict: An AI-Powered Legal Judgment Prediction System for Indian Criminal Law

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Base paper:

- C. He, T.-P. Tan, X. Zhang and S. Xue, "Knowledge-Enriched Multi-Cross Attention Network for Legal Judgment Prediction," *IEEE Access*, vol. 11, pp. 89497–89512, Aug. 2023, doi: 10.1109/ACCESS.2023.3305259.

  (https://ieeexplore.ieee.org/document/10216994)

- Y. Le, Z. Quan, J. Wang, D. Cao, and K. Li, "R^2: A Novel Recall & Ranking Framework for Legal Judgment Prediction," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 32, pp. 1609–1622, 2024, doi: 10.1109/TASLP.2024.3365389.

  (https://ieeexplore.ieee.org/document/10439618)

Keywords: Legal Judgment Prediction, Multi-Label Classification, Legal Knowledge Integration, Retrieval-Augmented Generation (RAG), Similar Case Matching, Attention Mechanism, Recall and Ranking (R^2), Precedent-Based Reasoning, Explainable Legal AI, Structured Legal Knowledge, Court-Style Judgment Generation, NLP in Law.

Abstract

- Many citizens in India lack awareness of their legal rights, applicable laws, and potential case outcomes, making legal processes intimidating and inaccessible.
- Hybrid AI framework that predicts charges, IPC sections, and sentence durations from case facts using **retrieval-augmented legal knowledge (RAG)**, **attention-based precedent reasoning**, and a **two-stage recall-and-ranking mechanism**.
- By combining structured law, similar case analysis, and explainable judgment generation, the model empowers both legal professionals and the public with clearer, faster, and more transparent legal decision support under Indian criminal law.

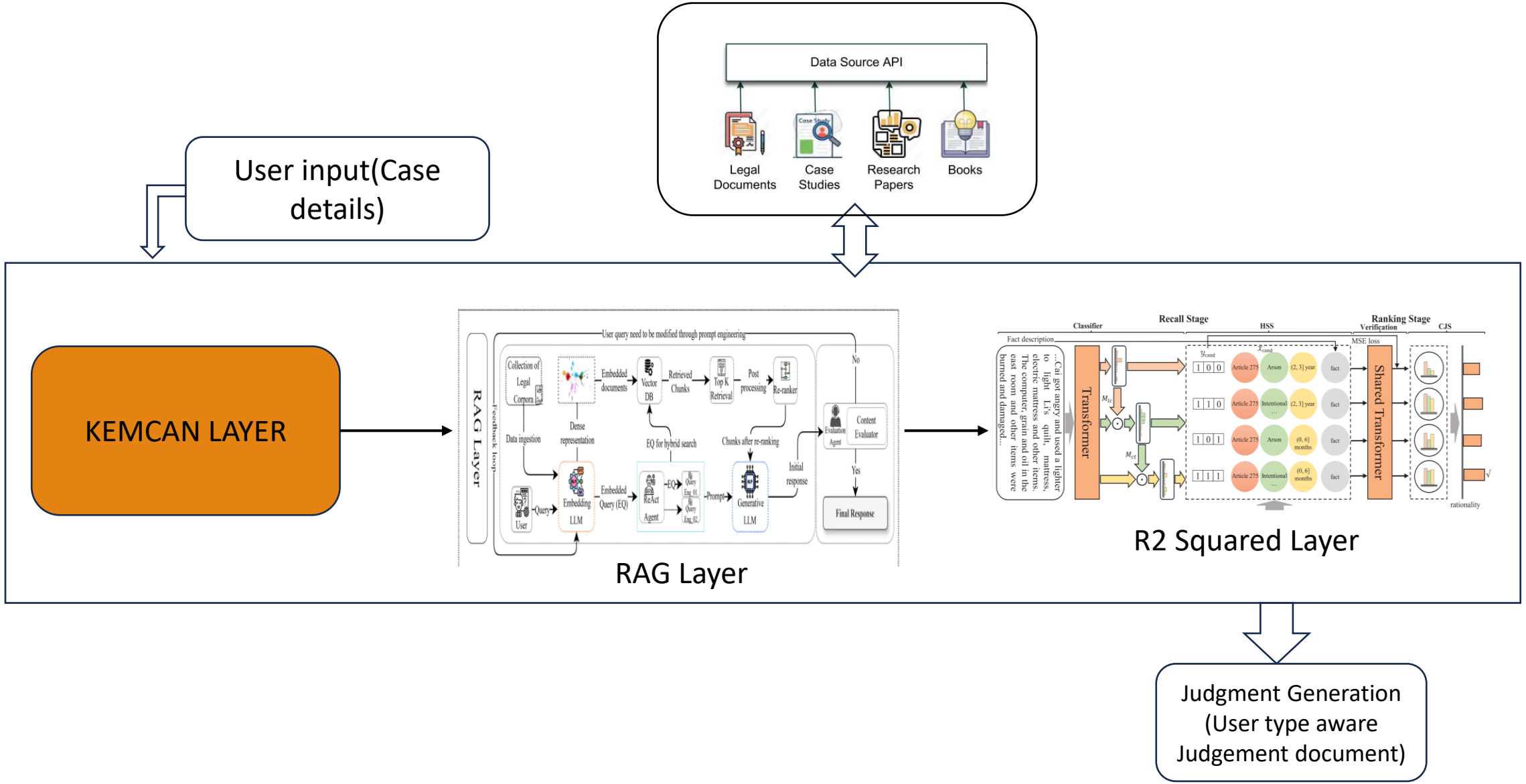
Limitations

- Existing models ignore **similar past cases**, leading to context-insensitive and inconsistent predictions.
- Many models don’t use **actual IPC definitions** or structure — they learn patterns blindly from data, which can lead to legally invalid predictions.
- The models function as black boxes, offering no reasoning, highlighted facts, or legal justification behind their decisions.

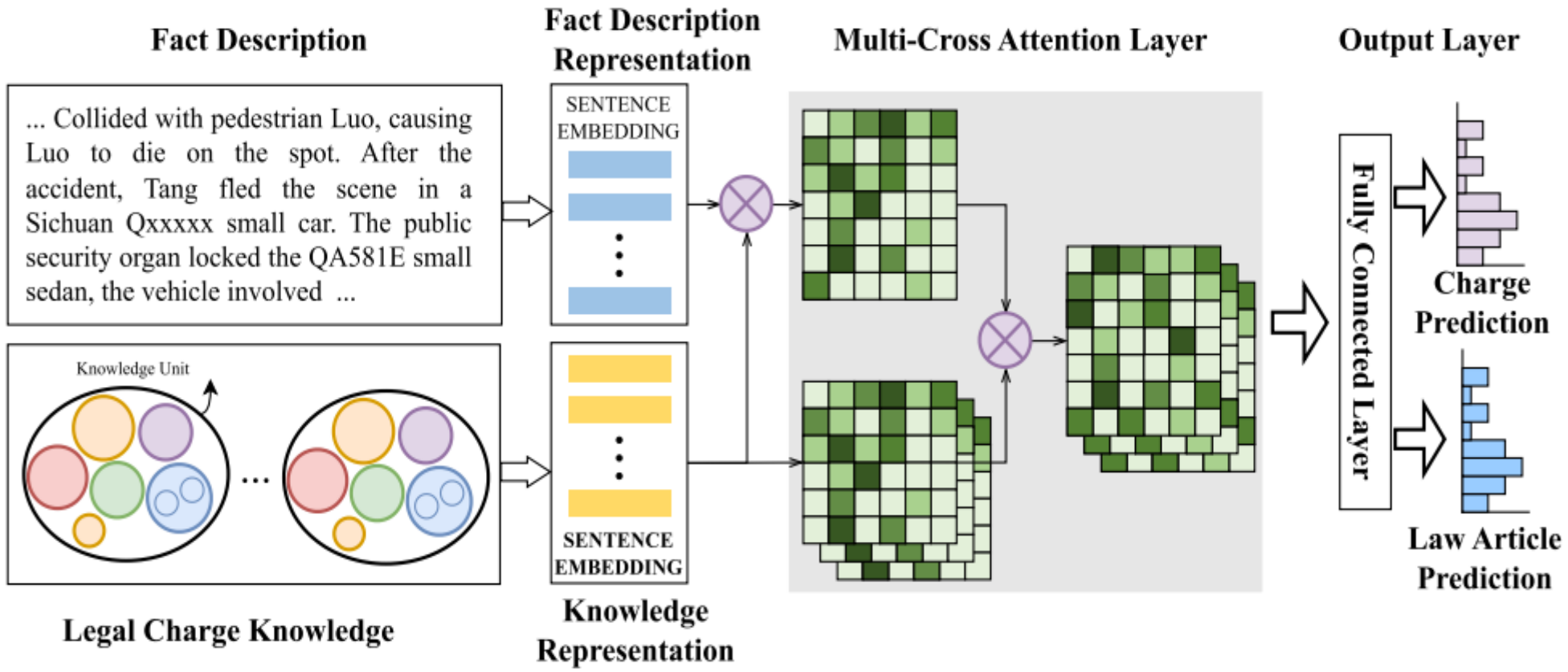
Objective:

- **Develop a multi-task AI model** that predicts charges, IPC sections, and sentence durations from factual case descriptions using structured legal knowledge and language models.
- **Integrate legal reasoning through a 6-tuple knowledge base** (definition, subjective/objective elements, legal context) and **attention-based retrieval of similar Indian cases** to enhance prediction accuracy and interpretability
- **Implement a two-stage recall-and-ranking mechanism** to generate multiple legal outcome candidates and verify them using semantic consistency for confusion-prone cases.
- **Generate court-style judgment documents** with explainable predictions, tailored for both legal professionals and general users in formats that include sections like “Facts”, “Analysis”, “Applicable Law”, and “Verdict”.

Proposed Workflow



Knowledge-Enriched Multi-Cross Attention Network



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