Explainable Conversational Question Answering over Heterogeneous Sources via Iterative Graph Neural Networks

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q^1: *Who wrote the book Angels and Demons?*
a^1: Dan Brown
q^2: *the main character in his books?*
a^2: Robert Langdon
q^3: *who played him in the films?*
a^3: Tom Hanks

integrating information from a mixture of sources with user- comprehensible explanations for answers.

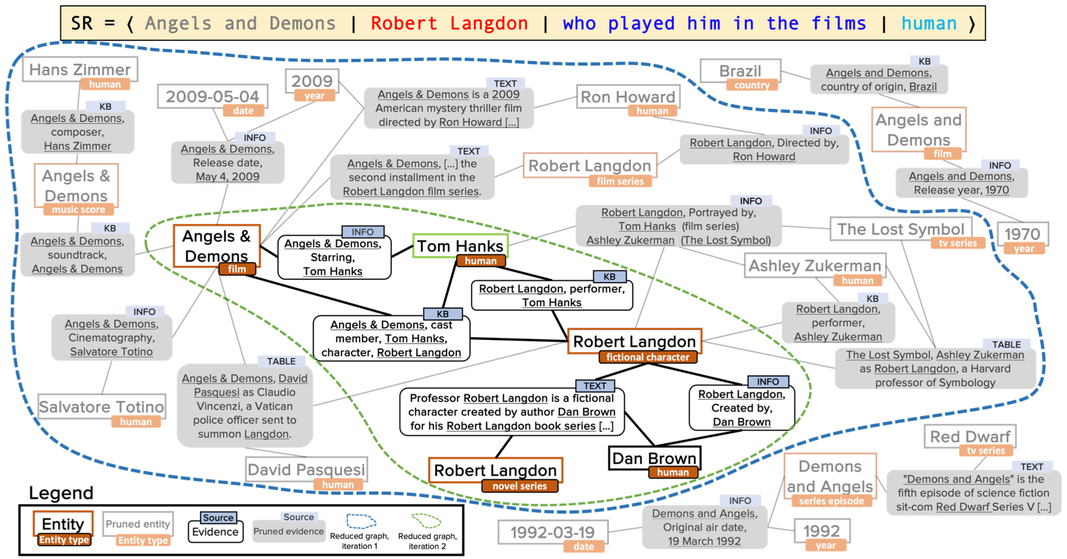

Figure 1: Toy heterogeneous graph for answering q^3, showing two pruning iterations. The graph is iteratively reduced by GNN inference to identify the key evidences. The subgraph surrounded by the blue dotted line is the result of the first iteration, while the green line indicates the graph after the second. From this smaller subgraph, the final answer (Tom Hanks) is inferred.

Construction of a heterogeneous graph from entities and evidence snippets retrieved from a KB, a text corpus, web tables, and infoboxes. This large graph is then iteratively reduced via graph neural networks that incorporate question-level attention,
until the best answers and their explanations are distilled out