Improving Pinterest Search Relevance Using Large Language Models

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ABSTRACT

To improve relevance scoring on Pinterest Search, we integrate Large Language Models (LLMs) into our search relevance model, leveraging carefully designed text representations to predict the relevance of Pins effectively. Our approach uses search queries alongside content representations that include captions extracted from a generative visual language model. These are further enriched with link-based text data, historically high-quality engaged queries, user-curated boards, Pin titles and Pin descriptions, creating robust models for predicting search relevance. We use a semi-supervised learning approach to efficiently scale up the amount of training data, expanding beyond the expensive human labeled data available. By utilizing multilingual LLMs, our system extends training data to include unseen languages and domains, despite initial data and annotator expertise being confined to English. Furthermore, we distill from the LLM-based model into real-time servable model architectures and features. We provide comprehensive offline experimental validation for our proposed techniques and demonstrate the gains achieved through the final deployed system at scale.

CCS CONCEPTS

• **Information systems** → **Retrieval models and ranking**; **Web searching and information discovery**.

KEYWORDS

Search Recommendation Systems, Relevance Modeling, Large Language Models

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1 INTRODUCTION

Search relevance measures how well the search results align with the intent behind the search query. Using a relevance objective allows search engines to ensure that the content displayed to users is genuinely pertinent to their information needs. Without relevance scores, search engines might overly rely on factors like past user engagement, leading to results skewed towards click-worthy or sensational content rather than truly relevant information, compromising the quality and usefulness of a search engine.

Pinterest Search is one of the key surfaces on Pinterest where users can discover inspiring contents that align with their information needs. Delivering a relevant search feed helps better fulfill users' intent and bring them the inspiration to create a life they love. The visual discovery nature of Pinterest Search poses unique challenges, as most content on the platform is present in the format of images or videos. Additionally, Pinterest Search serves a global audience in real-time, needing to accommodate users who speak over 45 different languages with diverse cultural backgrounds and interests using Pinterest for visual discovery.

To measure the relevance between queries and Pins, we use a 5-level guideline, where higher levels indicate better relevance. Compared to binary relevance judgements, such fine-grained relevance judgments can better capture the complex relationship between queries and Pins. Based on this guideline, we build a search relevance model by fine-tuning Large Language Models (LLMs) to

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