

Applying Large Language Models to Interactive Information Retrieval: A Practical Exploration

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Abstract

This half-day interactive tutorial provides researchers with practical skills to use large language models (LLMs) for interactive information retrieval research. Through hands-on exercises and real-world research examples, participants will learn to set up LLMs locally, integrate them via APIs, and evaluate their outputs. The tutorial will explain which models suit specific research needs, offering participants a robust toolkit to enhance their work. Attendees will also gain insights into the latest developments in the field, ensuring they stay at the forefront of innovation. Ideal for researchers eager to explore new methodologies in information retrieval, this tutorial offers foundational knowledge and cutting-edge strategies to use LLMs in interactive information retrieval research.

CCS Concepts

• **Information systems** → **Users and interactive retrieval; Language models.**

Keywords

Interactive Information Retrieval, Large Language Models, Methods, Evaluation

ACM Reference Format:

Johanne R. Trippas, Oleg Zendel, and Adam Roegiest. 2025. Applying Large Language Models to Interactive Information Retrieval: A Practical Exploration. In *2025 ACM SIGIR Conference on Human Information Interaction and Retrieval (CHIIR '25)*, March 24–28, 2025, Melbourne, VIC, Australia. ACM, New York, NY, USA, 2 pages. <https://doi.org/10.1145/3698204.3716478>

1 Introduction

The rapid growth of the internet has led to a staggering increase in online data, making it increasingly challenging for users to find relevant and accurate information. The traditional keyword-based search paradigm is no longer effective in handling complex information needs or providing personalized results. In response to this challenge, researchers have been exploring alternative approaches that leverage Artificial Intelligence (AI) techniques, such as Natural Language Processing (NLP), to enhance the user experience [4].

The rise of LLMs has reshaped the field of information retrieval, but many researchers with a more human-centred, qualitative focus have found themselves sidelined by the technicalities of these tools.

This tutorial is designed to bridge that gap, ensuring that “soft-skilled” researchers – those focusing on user experience, human-computer interaction, or ethical implications – have the practical knowledge needed to understand, use, and interpret LLMs. By providing an accessible, hands-on introduction to these technologies, the workshop will empower all researchers, regardless of their technical background, to harness LLMs for deeper, more interdisciplinary insights.

This tutorial will explore the applications and limitations of LLMs for interactive information retrieval. Through a combination of theoretical foundations, real-world examples, and hands-on exercises, participants will gain insights into how these models can be used to improve user experiences in various contexts. By attending this tutorial, researchers and students will develop practical skills and knowledge that can contribute to developing more effective search engines and other applications that leverage LLMs.

Upon completing this tutorial, participants will:

- Understand the theoretical foundations of LLMs for interactive information retrieval.
- Gain practical experience with hands-on exercises that demonstrate the capabilities and limitations of LLMs.
- Have a better understanding on how to run LLMs on their personal computers through applications such as Ollama¹ and use APIs such as Openrouter²
- Develop a critical understanding of the current research landscape and future directions for improving interactive information retrieval.

This tutorial is designed for researchers and students interested in applying LLMs to interactive information retrieval research.

The target audience includes PhD students, postdoctoral researchers, industry professionals, and academics seeking to expand their knowledge on LLMs. No prior experience with LLMs is required; a basic understanding of computer programming concepts will be beneficial.

Throughout the tutorial, participants will engage in hands-on exercises and discussions that foster collaboration among experts from diverse backgrounds. By attending this tutorial, attendees will gain an understanding of LLMs for interactive information retrieval and develop practical skills to design novel AI-powered applications or contribute to ongoing research [2].

2 Syllabus

This half-day tutorial provides first exploration of the theoretical foundations and practical applications of LLMs in interactive information retrieval research. Through a combination of lectures,



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CHIIR '25, Melbourne, VIC, Australia

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ACM ISBN 979-8-4007-1290-6/25/03

<https://doi.org/10.1145/3698204.3716478>

¹<https://ollama.com/>

²<https://openrouter.ai/>

discussions, and hands-on exercises, participants will gain a solid understanding of how to effectively use LLMs in their research. Additionally, they will learn to critically select the right LLM for their tasks while considering various constraints, such as data privacy, response time, reproducibility, and hardware limitations.

- **Part 1: Theoretical foundations:** Participants will gain a foundational understanding of how LLMs contribute to interactive information retrieval, exploring the core principles underlying their use in enhancing search and retrieval outcomes.³
- **Part 2: Practical skills development:** Participants will develop practical skills by applying various LLMs to real-world information retrieval scenarios. They will learn to use LLMs for a small labelling task used as a running example.
- **Part 3: Critical evaluation of research landscape:** Finally, participants will critically assess the current landscape of LLM-based research in interactive information retrieval, examining the latest advancements, potential, and limitations of these technologies.

3 Learning Outcomes

- **Install and configure LLMs:** Learn how to set up and run large language models both locally and via APIs to support interactive information retrieval tasks.
- **Better understand LLM capabilities:** Gain a clear understanding of how LLMs function, their strengths, and their limitations in the context of information retrieval research [5].
- **Apply LLMs in human-centred research:** Use LLMs in research that emphasizes user interaction, experience, and ethical considerations, ensuring inclusive and interdisciplinary applications [1, 3].
- **Stay current with advances:** Identify resources and strategies to stay updated on the latest developments and tools in LLMs and information retrieval research.
- **Collaborate across disciplines:** Work effectively with both technical and non-technical teams to integrate LLMs into diverse research projects.

4 Target Audience

This tutorial is designed for researchers and students interested in using LLMs for interactive information retrieval. It welcomes PhD students, postdocs, industry professionals, and academics looking to expand their expertise in LLMs and integrate them into their research. No prior experience with LLMs is necessary, though a basic understanding of programming concepts will be helpful. The workshop also emphasizes making LLMs accessible to human-centred researchers, ensuring that those with qualitative or user-focused backgrounds can effectively use and interpret these models in their work.

5 Presenters

Dr Adam Roegiest is the VP of Research and Technology at Zuva, a Toronto-based legal AI startup. Adam's research has focused on the application of information retrieval and machine learning

technologies to legal retrieval tasks. More recently, he has extended his research into how these technologies interact with human-computer interaction and accessibility. Adam previously organised both iterations of the TREC Total Recall track, one iteration of the TREC Real-Time Summarization track, and a workshop at CHIIR 2024. Adam is also a steering committee member for CHIIR.

Dr Johanne Trippas is a Vice-Chancellor's Senior Research Fellow at RMIT University, specializing in intelligent systems, focusing on digital assistants and conversational information seeking. Their research aims to enhance information accessibility through conversational systems, interactive information retrieval, and human-computer interaction. Additionally, Johanne is part of the NIST TREC program committee and is an ACM CHIIR steering committee member. They serve as vice-chair of the SIGIR Artifact Evaluation Committee, workshop chair for ACM CHIIR'25, and program chair for ACM CHIIR'26. Johanne has organized the ACM Conversational User Interfaces (CUI'24) conference, workshops (CHIIR'20-22, '24, ECIR'24-25), a TREC Track (CaST'22), and tutorials (CHIIR'21, SIGIR'22, WebConf'23, and ECIR'24).

Dr Oleg Zendel is a Research Fellow at the ARC Centre of Excellence for Automated Decision-Making and Society (ADM+S) at RMIT University, Melbourne, Australia. His research focuses on information retrieval, with an emphasis on query variability, search system evaluation, and user experience in search systems. Dr. Zendel has extensive experience applying large language models (LLMs) to various information retrieval tasks, including classifying the cognitive difficulty of search topics, assessing document relevance, and generating query variants for given topics.

Acknowledgments

This work is partially supported by the Australian Research Council (CE200100005).

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³Note: We do not cover in-depth how LLMs function internally.