CENTRAL LIBRARY

PRE - CONFERENCE WORKSHOP REPORT CLSTL - 2025

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Introduction -

As part of the pre-conference activities, a workshop titled "AI-Powered Search in Libraries: A Crash Course on Understanding the Fundamentals for Library Professionals" was conducted by Mr. Aaron Tay, Head of Data Services, Singapore Management University, and Ms. Bella Ratmelia, Senior Librarian, Singapore Management University. The workshop aimed to familiarize library professionals with the growing role of Artificial Intelligence in academic search and retrieval, particularly the use of Generative AI and Large Language Models (LLMs).

Recognizing the importance of this emerging area, Dr. Mahesh K. Solanki, Librarian, Gujarat Technological University (GTU), attended the pre-conference workshop. His participation highlighted GTU's commitment to staying at the forefront of technological advancements in library and information science.

The workshop provided an in-depth conceptual exploration of how AI is reshaping academic information retrieval. It focused on key concepts such as Retrieval-Augmented Generation (RAG), semantic search techniques (Dense embedding bi-encoder, ColBERT), and lexical search methods (TF-IDF, BM25).

The resource persons explained the fundamentals of LLMs, their functioning, and their growing integration into academic search systems. Special emphasis was placed on enabling librarians to critically evaluate these tools, understand their implications, and guide users effectively. Importantly, the workshop was designed to be non-technical, requiring no coding knowledge, making it accessible to a wide range of library professionals.

Workshop Report 1

Title: AI for Libraries: Building Applications for Search, Chatbots, and Archiving

Speaker: Prof. Mayank Singh, Assistant Professor, Computer Science & Engineering

Duration: 3 Hours

The workshop "AI for Libraries: Building Applications for Search, Chatbots, and Archiving" was conducted by Prof. Mayank Singh, Assistant Professor, Department of Computer Science & Engineering. The session aimed to introduce participants to the growing role of Artificial Intelligence (AI) in modern library systems and provide hands-on experience with AI applications relevant to search, chatbots, and digital archiving.
The workshop was structured into five parts:

Introduction to AI in Libraries (30 minutes):
Prof. Singh provided an overview of how AI technologies are transforming library services. Examples were shared on the use of AI in enhancing search functionality, providing chatbot-based user support, and enabling efficient digital archiving. A live demonstration of AI-powered tools in libraries set the foundation for the technical sessions.

Hands-On Session 1 – AI-Powered Search & Recommendation (45 minutes):
This session demonstrated how AI improves search accuracy and book recommendation systems. Participants practiced building a recommendation model using Python and the OpenAI API. Tools such as spaCy and NLTK were introduced to analyze book descriptions and suggest related titles, providing insight into natural language processing (NLP) for library resources.

Hands-On Session 2 – Building a Library Chatbot (45 minutes):

Participants explored the concept of AI chatbots for addressing frequently asked questions and enhancing user engagement. Using Python in Google Colab/Jupyter Notebook and the ChatGPT API, attendees coded a basic chatbot prototype customized for library queries, gaining an understanding of conversational AI design.

Hands-On Session 3 – AI for Digital Archiving & OCR
(45 minutes):
The session focused on digitizing and preserving old manuscripts and books through Optical Character Recognition (OCR). Using Tesseract OCR in Python, participants extracted text from scanned documents. The exercises included text cleaning, summarization, and metadata tagging with AI models, highlighting the relevance of AI in archival practices.

Wrap-up & Q&A (15 minutes):
The workshop concluded with a recap of the key learnings. Prof. Singh discussed real-world applications of AI in libraries and shared resources for further exploration. An interactive Q&A session allowed participants to clarify concepts and share their reflections.
Key Takeaways

- Understanding of AI's role in transforming library services.
- Practical skills in building AI-powered search, recommendation systems, and chatbots.
- Exposure to OCR-based digitization techniques and metadata tagging.
- Experience with widely used AI tools and APIs (OpenAI, spaCy, NLTK, Tesseract).

Workshop Report 2

Title: AI-Powered Search in Libraries: A Crash Course on Understanding the Fundamentals for Library Professionals

Speakers: Mr. Aaron Tay, Head, Data Services, Singapore Management University

Ms. Bella Ratmelia, Senior Librarian, Singapore Management University

The workshop "AI-Powered Search in Libraries" was designed to equip library professionals with a deeper conceptual understanding of emerging technologies that are reshaping information retrieval. With the rapid integration of Generative AI into academic search systems, the session addressed the pressing need for librarians to understand how these technologies function and how they can be effectively leveraged in library services.

Overview of the Workshop

The resource persons, Mr. Aaron Tay and Ms. Bella Ratmelia, both from Singapore Management University, provided participants with an in-depth yet accessible exploration of AI-powered search techniques. The workshop emphasized that while advanced AI tools are transforming discovery and access, librarians must develop a working knowledge of their underlying mechanisms to guide users responsibly and critically.

The session began with a discussion on the fundamentals of information retrieval and how traditional models are evolving with AI. Participants were introduced to Retrieval-Augmented Generation (RAG), a key technique that combines the strengths of large language models with curated retrieval methods to enhance the accuracy and reliability of search outputs.

A major focus of the workshop was on contrasting semantic search with lexical search. Semantic approaches such as dense embedding models, bi-encoders, and ColBERT were explained, showing how they capture the meaning and context of queries beyond keyword matching. In contrast, traditional lexical models such as TF-IDF and BM25 were discussed to highlight their continued relevance and limitations in comparison to newer AI-based approaches.

In addition, the speakers introduced participants to the fundamentals of large language models (LLMs), explaining their functioning at a conceptual level. Without requiring coding knowledge, attendees gained clarity on how these models generate responses, their potential applications in academic search, and the implications for information accuracy, bias, and ethical use.

Relevance for Library Professionals

The workshop underscored that librarians play a crucial role as intermediaries between complex AI-driven systems and end-users. By understanding these concepts, library professionals will be better positioned to evaluate AI-powered tools, guide researchers in their use, and critically assess both the opportunities and challenges posed by such technologies.

Importantly, the workshop was tailored to be non-technical, ensuring accessibility for professionals without programming backgrounds. This approach made it highly relevant for a broad audience of librarians and information specialists who are increasingly being called upon to navigate AI-driven search environments.

Glimpse of Pre - Conference Workshop

Conclusion

The crash course proved to be an insightful and timely initiative, offering librarians both conceptual clarity and professional preparedness in the era of AI-powered discovery systems. By demystifying RAG, semantic and lexical search techniques, and the basics of LLMs, the workshop enabled participants to build confidence in engaging with AI tools and to provide informed guidance to their academic communities.

The pre-conference workshop was highly insightful and forward-looking, providing participants with a clear conceptual understanding of AI-powered search technologies and their practical implications for libraries. The participation of Dr. Mahesh K. Solanki, Librarian, GTU, added value, reflecting GTU's vision of integrating emerging technologies into academic services.

By demystifying concepts like RAG, semantic vs. lexical search, and the basics of LLMs, the session successfully equipped librarians with the knowledge to navigate, evaluate, and guide users in adopting AI-based search tools. The workshop set a strong foundation for advancing library services in the digital era.