Weaviate

Hack Night at GitHub

Retrieval Augmented Generation with Weaviate's Query Agent, LlamaIndex and Comet

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Technical Trainer

Agenda

- Introduction to RAG Architecture
- Traditional Approach: Components & Challenges
- Query Agent Approach: Streamlined Solution
- Side-by-Side Comparison
- Live Demo
- Conclusion & Next Steps

Introduction to RAG

Safety and Effectiveness Assessment of Ultraviolet-C Disinfection in Aircraft Cabins

Kris Belland; Diego Garcia; Charles DeJohn; Gary R. Allen; William D. Mills; Stephen P. Glaudel

INTRODUCTION: Aircraft cabins, susceptible to disease transmission, require effective strategies to minimize the spread of airborne diseases. This paper reviews the James Reason Swiss Cheese Theory in mitigating these risks, as implemented by the International Civil Aviation Organization during the COVID-19 pandemic. It also evaluates the use of airborne ultraviolet-C (UV-C) light as an additional protective measure.

METHODS: Our approach involved a thorough literature review by experts and a detailed risk-vs.-benefit analysis. The review covered existing research to understand the scientific foundation, while the analysis used established techniques to assess the impact of influenza and COVID-19 in terms of infections, deaths, and economic costs.

RESULTS: Integrating UV-C light in aircraft cabins, when applied with appropriate scientific understanding and engineering safeguards, has the potential to reduce in-flight disease transmission. This additional mitigation strategy can work synergistically with existing measures.

DISCUSSION: The research and risk-vs.-benefit analysis present strong evidence for the safety and effectiveness of continuous UV-C disinfection in aircraft cabins. It suggests that UV-C light, maintained below exposure limits, can be a valuable addition to existing measures against disease transmission during flights.

KEYWORDS: UV-C disinfection, ultraviolet-C, UV-C, aircraft, sanitization, airborne pathogen, disease disinfection, disease transmission, disease translocation, risk mitigation strategy.

Belland K, Garcia D, DeJohn C, Allen GR, Mills WD, Glaudel SP. ***Safety and effectiveness assessment of ultraviolet-C disinfection in aircraft cabins.*** **Aerosp Med Hum Perform. 2024; 95(3):147–157.**

The use of ultraviolet (UV) light to decrease in-flight disease transmission has received attention as a potential measure to reduce the spread of infectious diseases, particularly during the COVID-19 pandemic. This paper is prepared in support of adding UV-C light-emitting diode (LED) lighting aboard aircraft to reduce the transmission and translocation of airborne diseases. Infectious diseases claim millions of lives globally each year.[12,57,58] The World Health Organization (WHO) addresses this situation as a major global health challenge, especially for low- and middle-income countries.[57] Many respiratory pathogens, including severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), influenza, respiratory syncytial virus, common colds, tuberculosis (TB), etc., are transmitted via three principal mechanisms: 1) inhaling infectious airborne droplets (from unshielded coughs or sneezes) before they fall to the floor (within 1–2 m);[40,42,53] 2) touching contaminated surfaces (fomites) before the pathogen decays; and 3) exposure to infected persons even by simple breathing or talking, which can produce aerosols that linger for minutes to hours and travel much farther than the 1–2 m traveled by droplets.[8,9,53] Early in COVID-19 pandemic, it was recognized that aerosols are a significant route of infection in indoor environments.[31] All pathogens that possess either DNA or RNA—viruses, bacteria, fungi, protozoa—are susceptible to UV disinfection.[1] This by no means suggests that UV-C airborne use is the only risk-mitigation strategy, but that it supplements other multiple layers including high efficiency particulate air (HEPA) filters, air flow, outside air ventilation, masks, vaccines,

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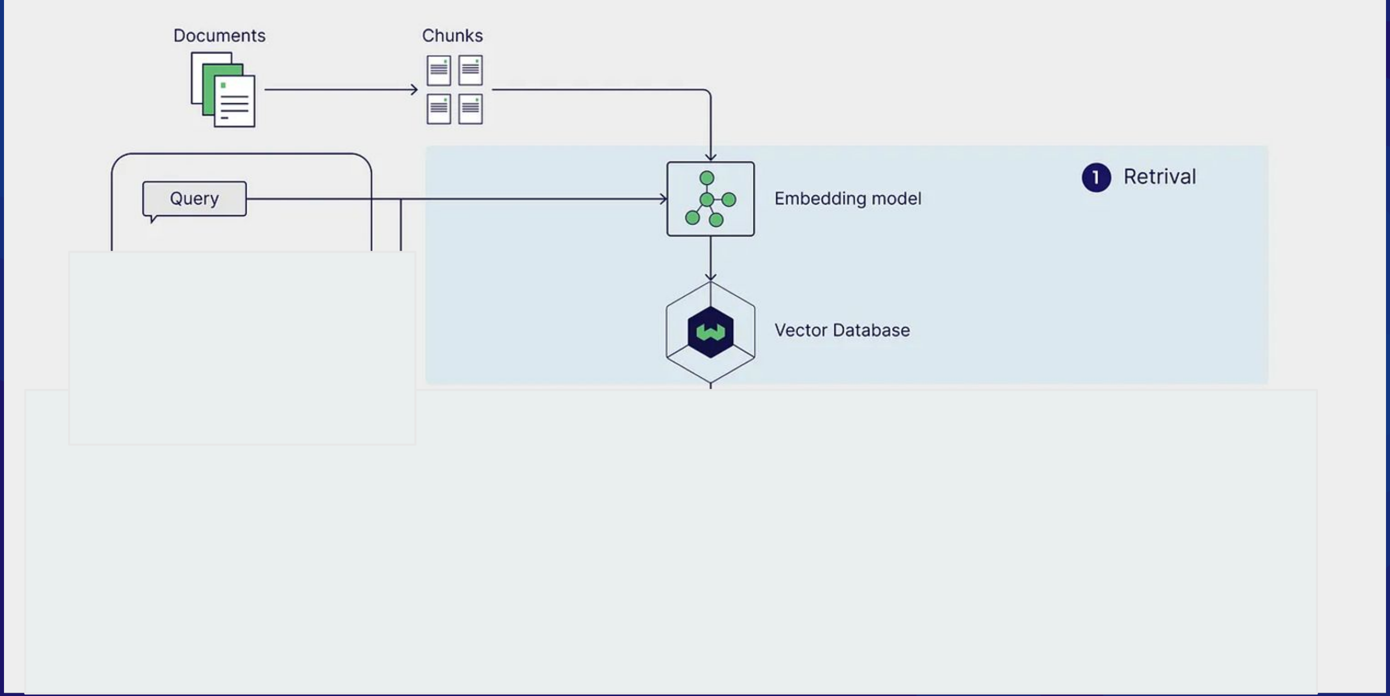
Introduction to RAG



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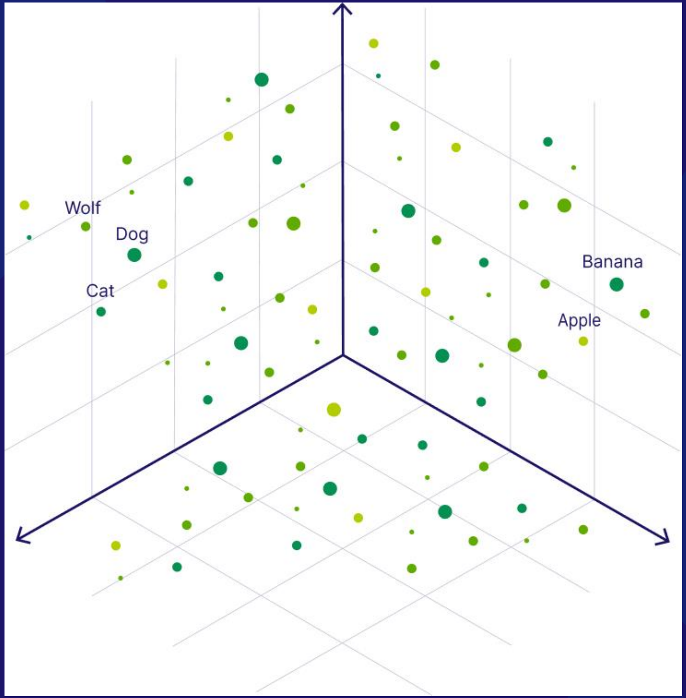

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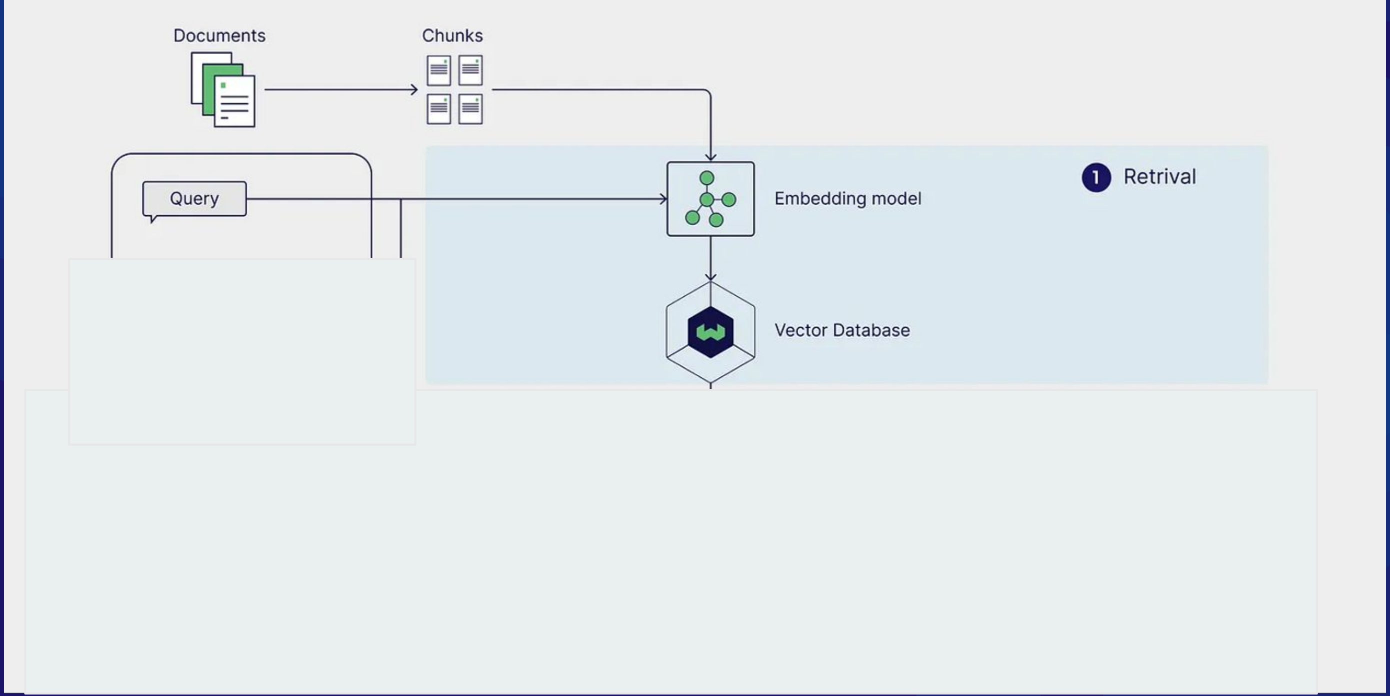

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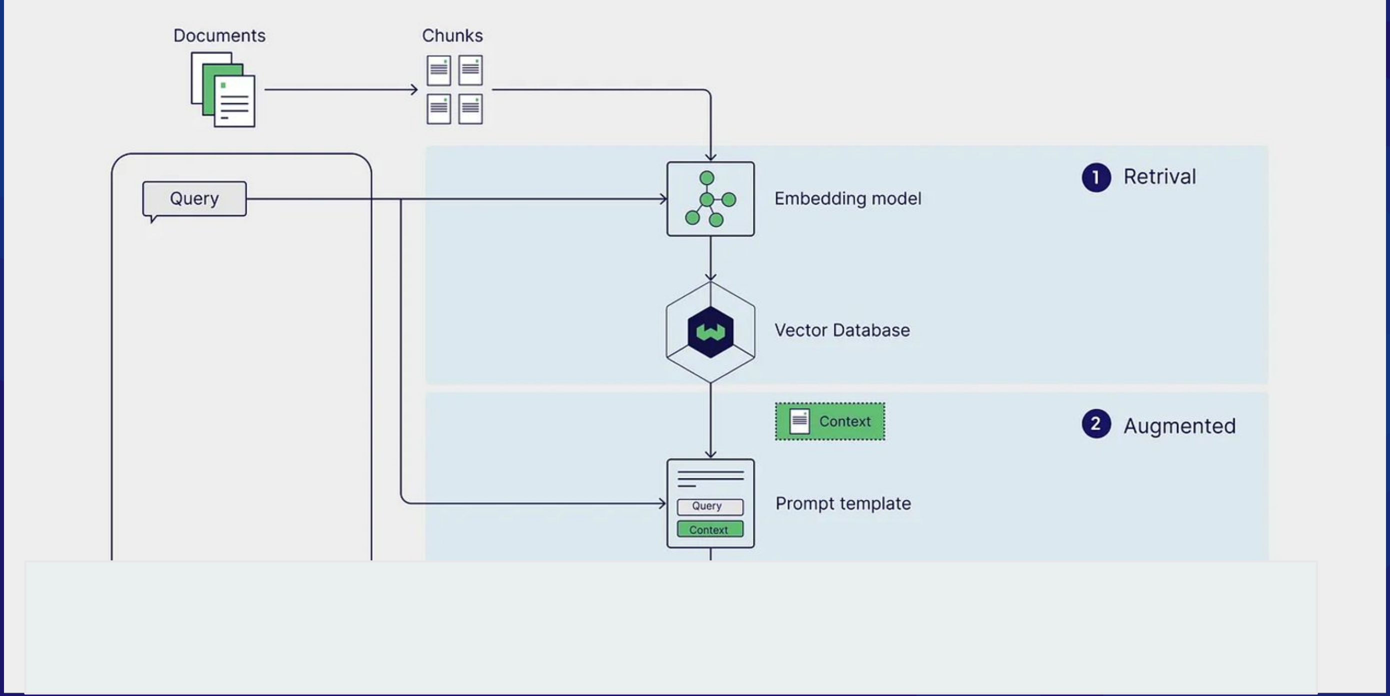

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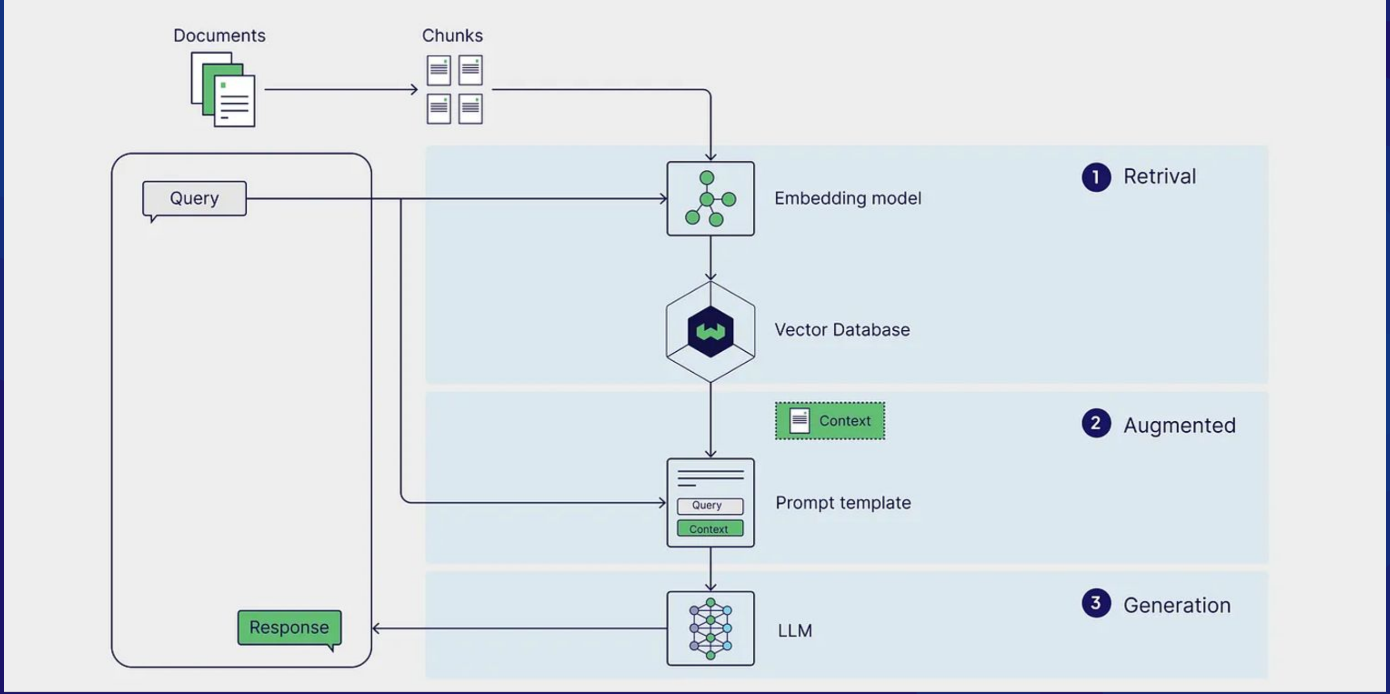
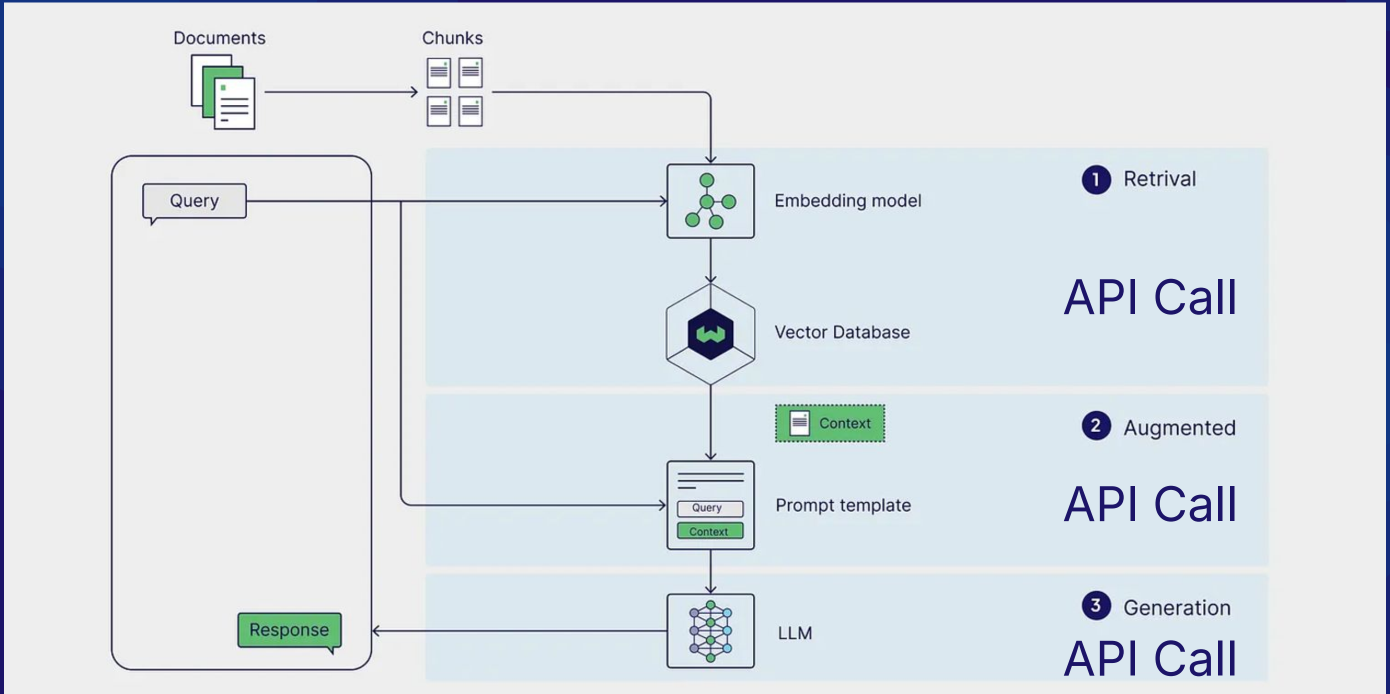
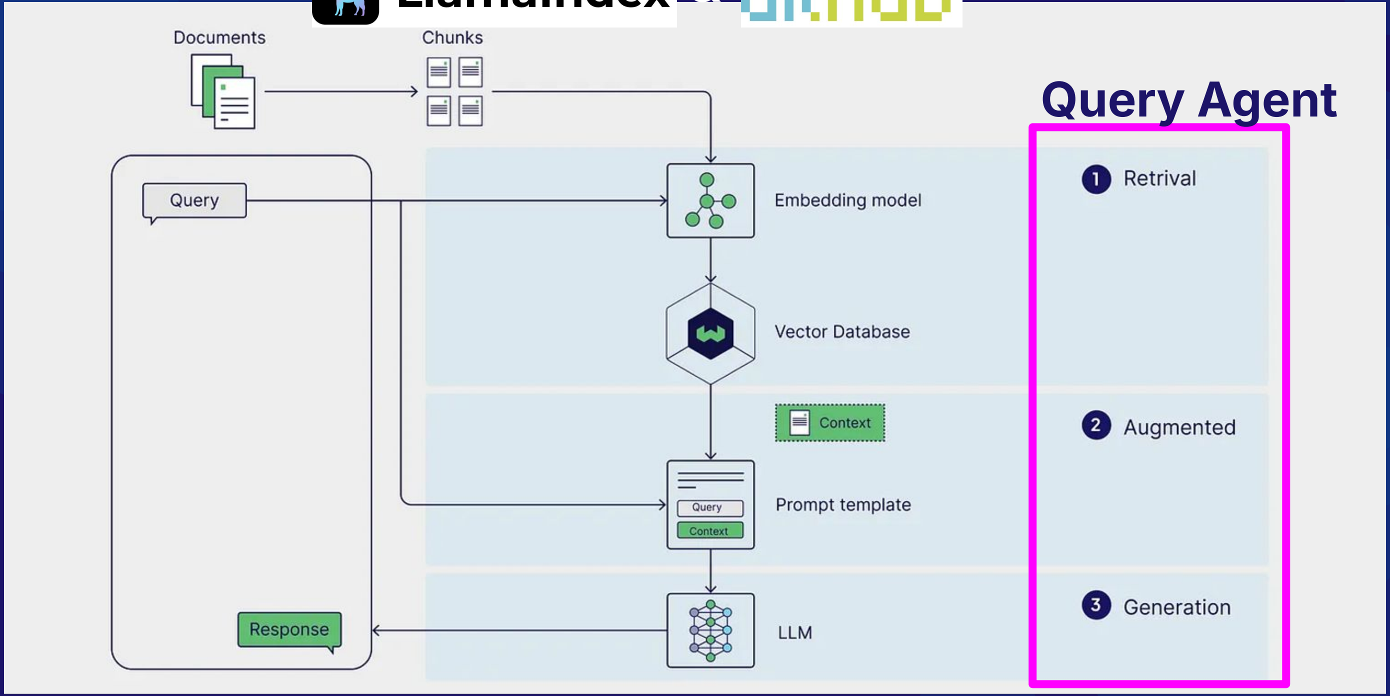


Traditional Approach Chaining Tools



Query Agent Approach

LlamaIndex & dltHub



Query Agent Approach