

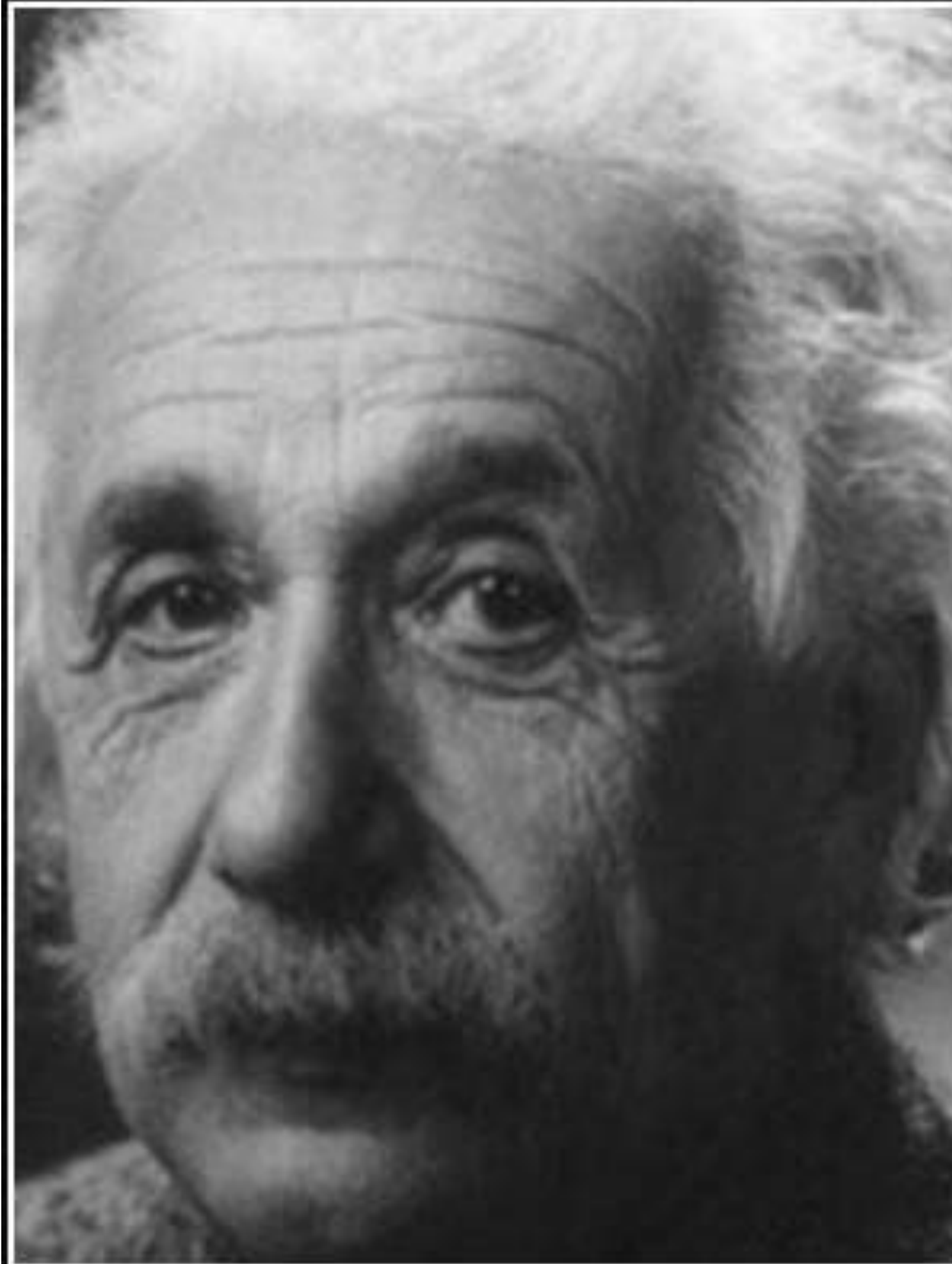


WEI ZHAO  
SUBSTITUTE LECTURER OF NATURAL LANGUAGE PROCESSING

# CROSS-TEMPORAL NATURAL LANGUAGE PROCESSING

Icons used in this talk: [flaticon.com](https://flaticon.com)





What we don't know is much more  
than what we know.

— *Albert Einstein* —

AZ QUOTES

**His face darkened, as if a cloud had passed over it**

**There is a rich, complex, shared data store in the cloud**

- (a) computing facilities**
- (b) the status of trouble and gloom**
- (c) a mass of watery vapour floating in the air**
- (d) a large group of animals moving together**



# Knowledge is fragmented





# CAN LLMS HELP WITH KNOWLEDGE SCARFFOLDING?





# ‘GPT-6 will be significantly better’: Sam Altman on what OpenAI learned from rocky GPT-5 launch

Users had pointed out that the advancements they had been expecting with OpenAI's GPT-5 model seemed incremental.

By: [Tech Desk](#)

New Delhi | Updated: October 13, 2025 02:55 PM IST

🕒 4 min read



r/singularity • 17 days ago

AngleAccomplished865 🏆 Top 1% Poster

...

## "Sam Altman says GPT-8 will be true AGI if it solves quantum gravity — the father of quantum computing agrees"

AI

<https://www.windowcentral.com/artificial-intelligence/sam-altman-says-gpt-8-could-achieve-true-agi-if-it-solves-quantum-gravity>

Keyword: "If,"

"According to Sam Altman:

*"You mentioned Einstein and general relativity, and I agree. I think that's like one of the most beautiful things humanity has ever figured out. Maybe I would even say number one... If in a few years... GPT-8 figured out quantum gravity and could tell you its story of how it did it and the problems it was thinking about and why it decided to work on that, but it still just looked like a language model output, but it was the real- it really did solve it..."*



News • LLM exaggerations and overgeneralizations

## Generative AI routinely blows up science findings

*When summarizing scientific studies, large language models (LLMs) like ChatGPT and DeepSeek produce inaccurate conclusions in up to*

# WHAT ARE THE PROBLEMS OF LLMS IN TEMPORAL CONTEXTS?

*73% of cases.* The study was published in the journal Royal Society Open Science by Uwe Peters (Utrecht University) and Benjamin Chin-Yee (Western University, Canada/University of Cambridge, UK). The researchers tested the most prominent LLMs and analyzed thousands of chatbot-generated science summaries, revealing that most models consistently produced broader conclusions than those in the summarized texts. Surprisingly, prompts for accuracy increased the problem and newer LLMs performed worse than older ones.

# **BACKGROUND OF AUDIENCES**



# **COURSE ORGANISATION**



# Grading system

- 60% term paper
- 30% a presentation
- 10% attendance
- Deadline for term paper: 17 March, 2026



# Presentation

- You will give a 30-min talk and 15-min QA
- Each lecture will have two talks
- Sign up for your presentation slot
  - <https://docs.google.com/spreadsheets/d/1E9hZaUB-22rfdrRw-PFAvEQ22yY5aPvq1MKeOwolpzQ/edit?usp=sharing>
- Non-presenters should prepare for the next lecture
  - Prepare 1-2 questions and send to us



# Presentation



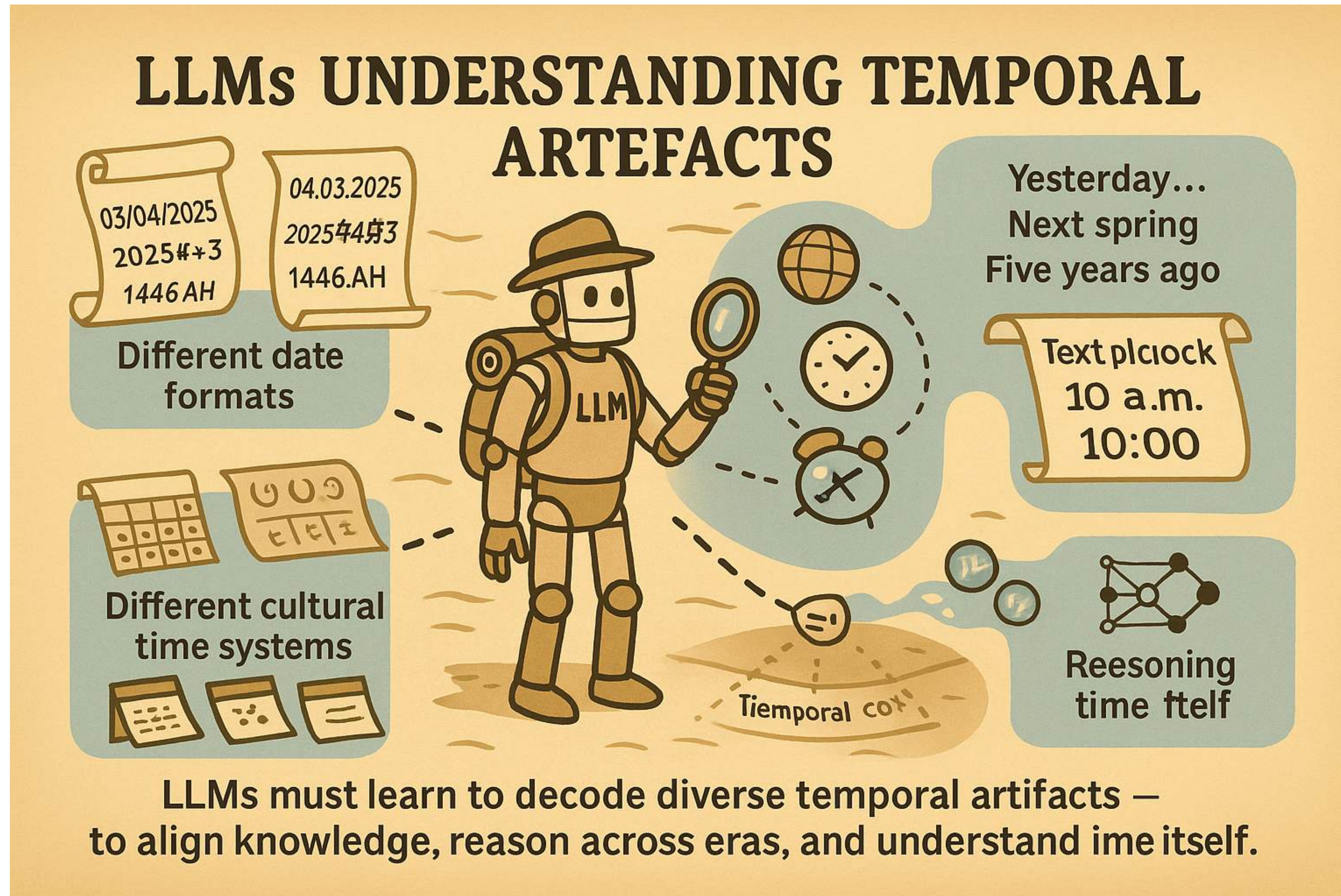
<https://www.youtube.com/watch?v=MAIAXPmU3mw>



# **PRESENTATION TOPICS**

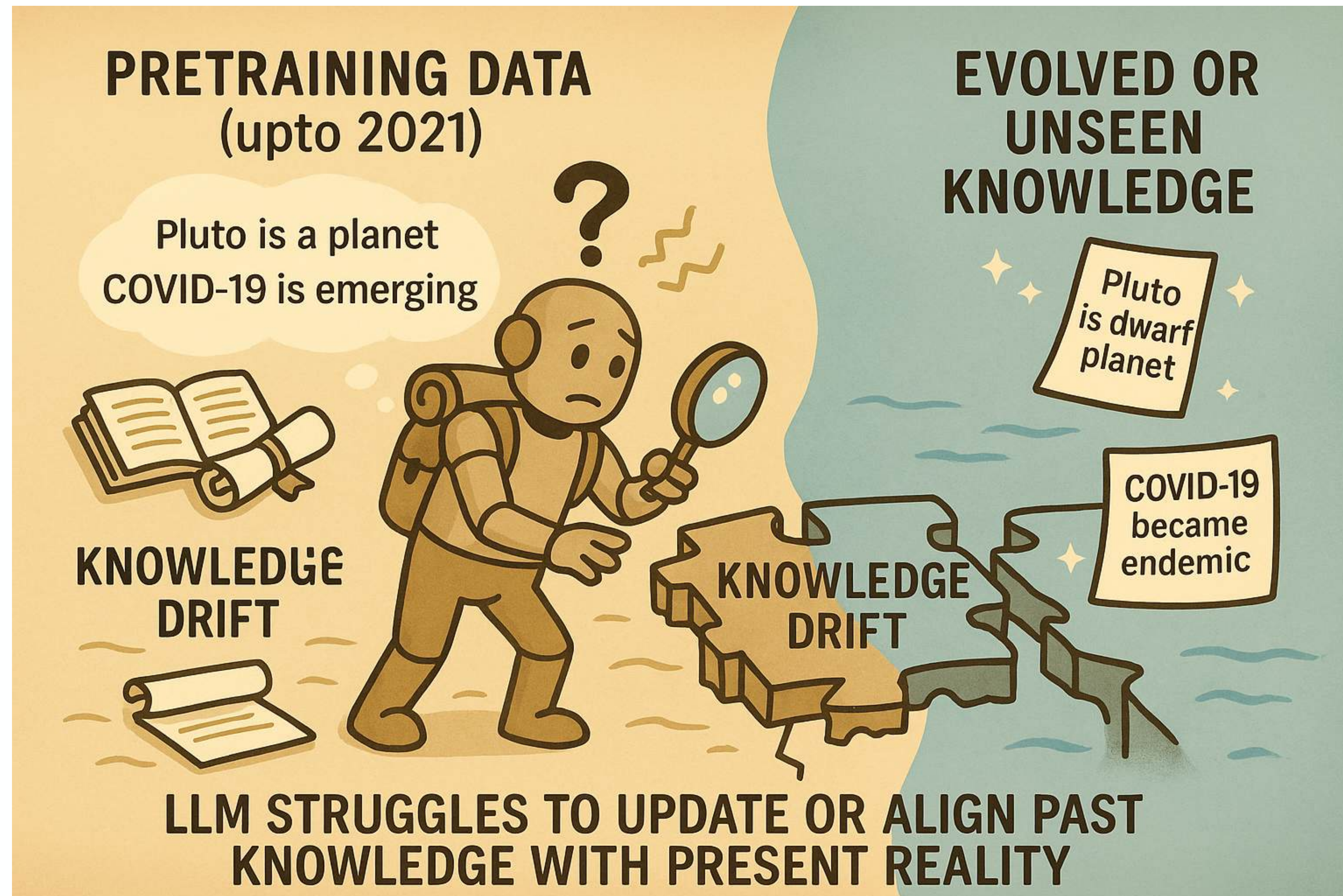


# Topic 1: temporal artefacts





# Topic 2: knowledge conflicts





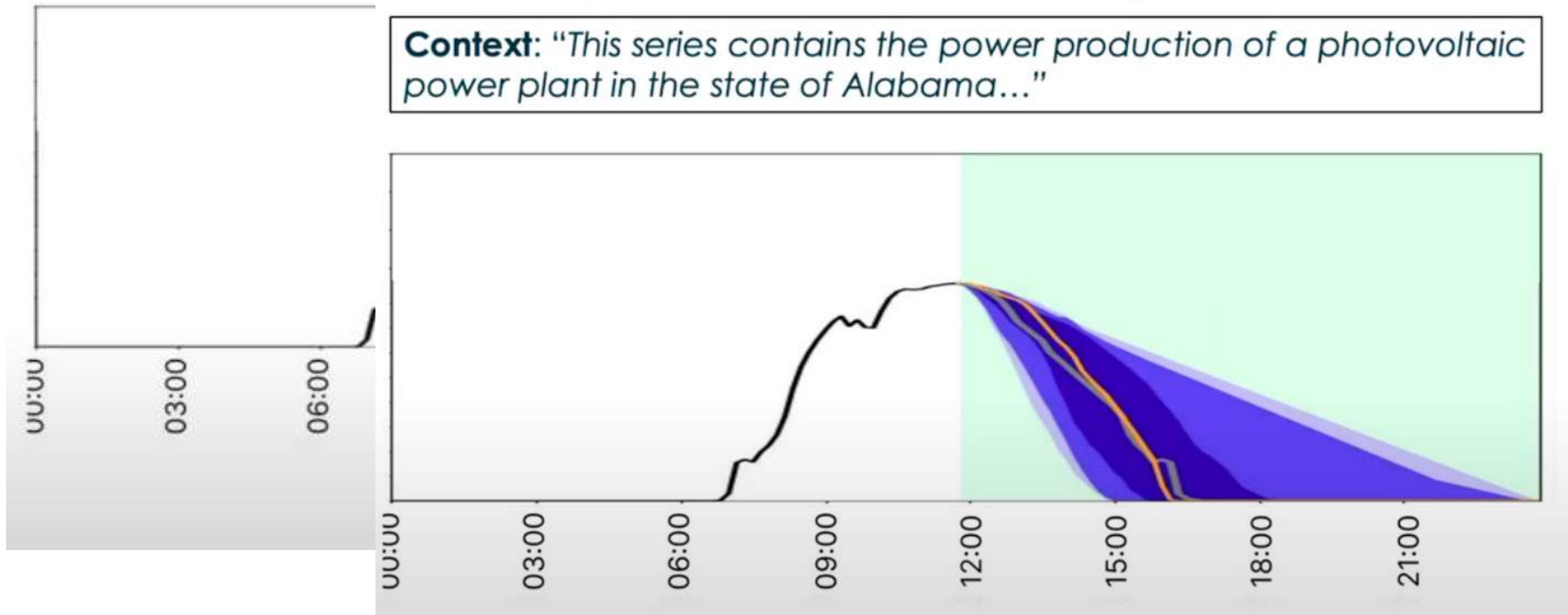
# Topic 3: temporal reasoning

***Prompt:*** Below are the list of head coaches for Chelsea FC.  
Who was the coach before Pochettino?  
Pochettino: July 2023 to May 2024  
Potter: September 2022 to April 2023  
Tuchel: January 2021 to September 2022  
Lampard: July 2019 to January 2021 and April 2023 to June 2023  
Sarri: July 2018 to June 2019

***Model Response:*** The coach before Pochettino was **Frank Lampard** during his second stint with the club from April 2023 to June 2023.

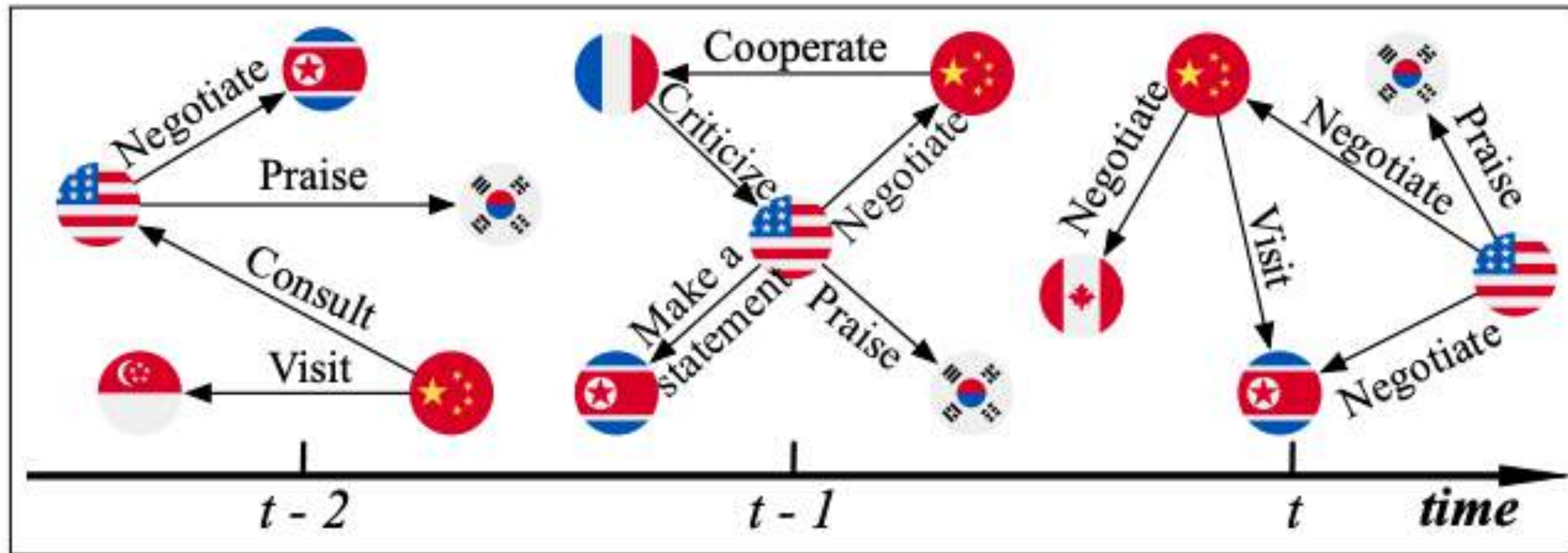


# Topic 4: time-series forecasting



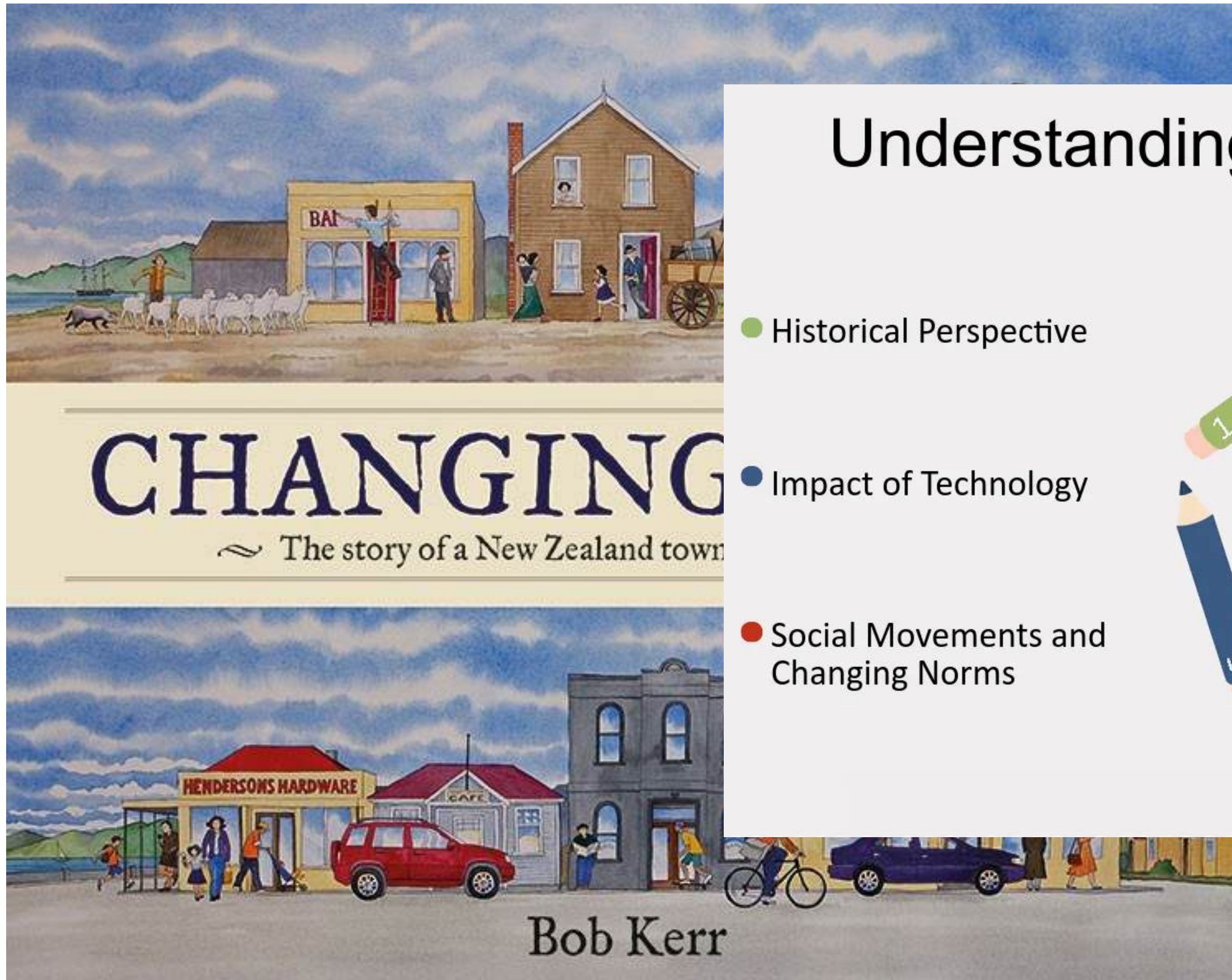


# Topic 5: temporal knowledge graph





# Topic 6: Cultural change over time



## Understanding Cultural Drift

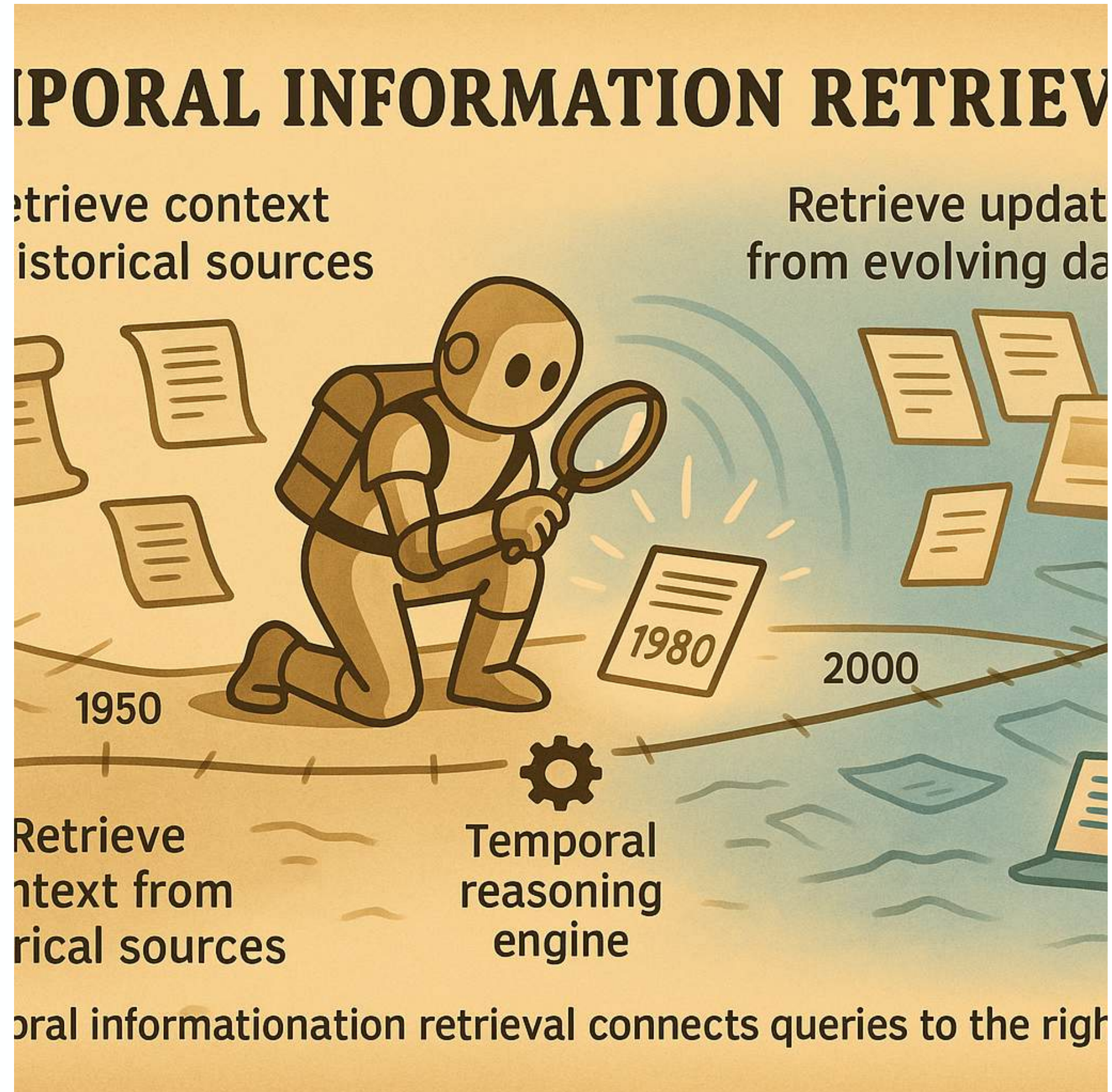
- Historical Perspective
- Impact of Technology
- Social Movements and Changing Norms



- Cultural Exchange and Globalization
- Migration and Cultural Hybridity



# Topic 6: temporal information retrieval



What are the ideas about LLMs for healthcare published between 2022 and 2024?

What are the major breakthroughs in temporal reasoning in 2025?

Image credit: DALL-E



# Term paper

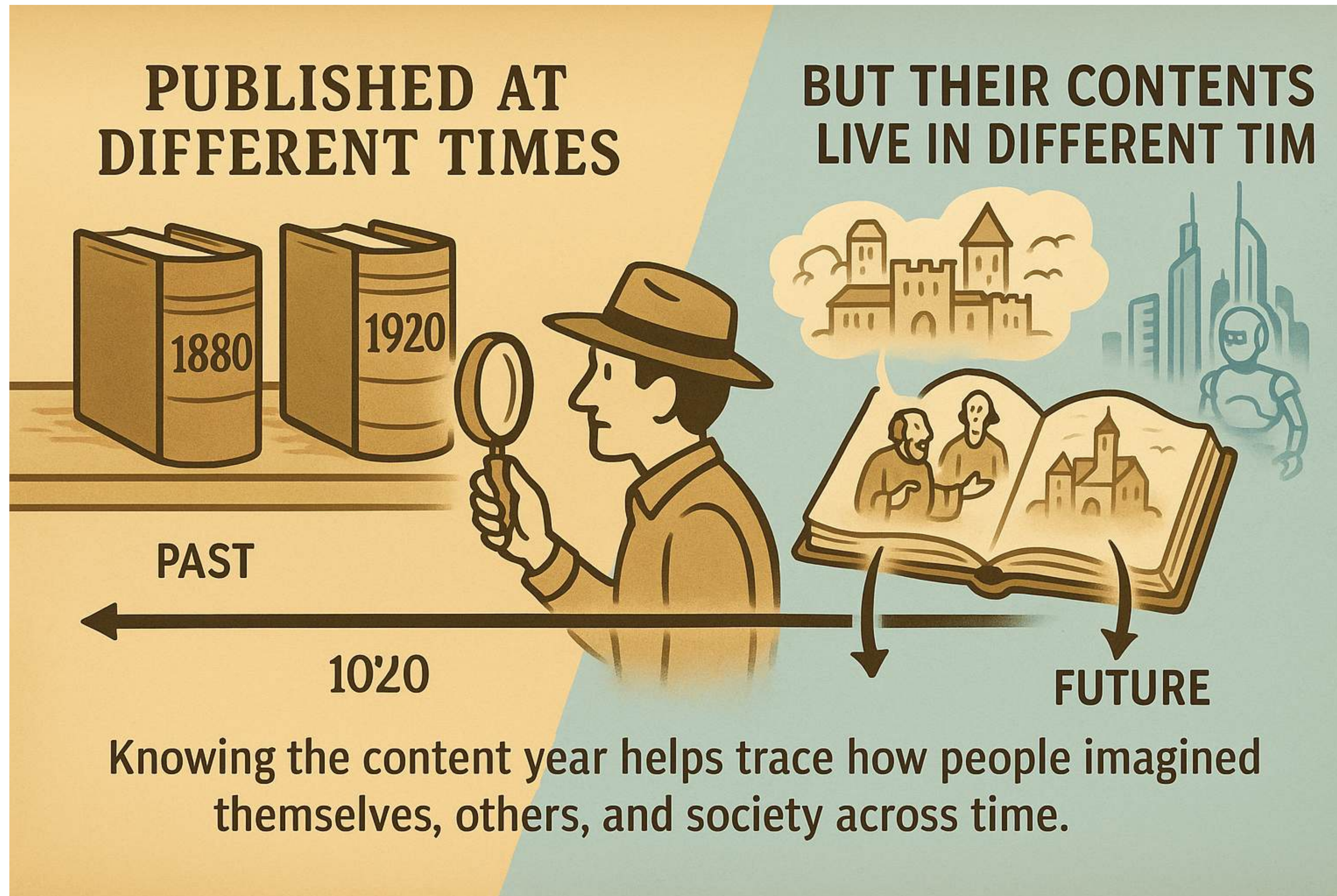
- 3-4 students work in a group
- 8 pages of content + unlimited pages of references
- Biweekly/monthly supervision
- Template:
  - <https://www.overleaf.com/1476718452xshrqqpjvkvm#47a63b>



# PROJECT TOPICS



# Project: literary representation



A novel published in 2000

A detective novel might describe a vandalism scene where the culprit is introduced as “a young Muslim man, radicalised by foreign preachers, who was caught painting over the statue during the World War II.

Islam => destructive acts

literary stereotype in  
2000 or 1940s?





# Project: sleeping ideas comeback

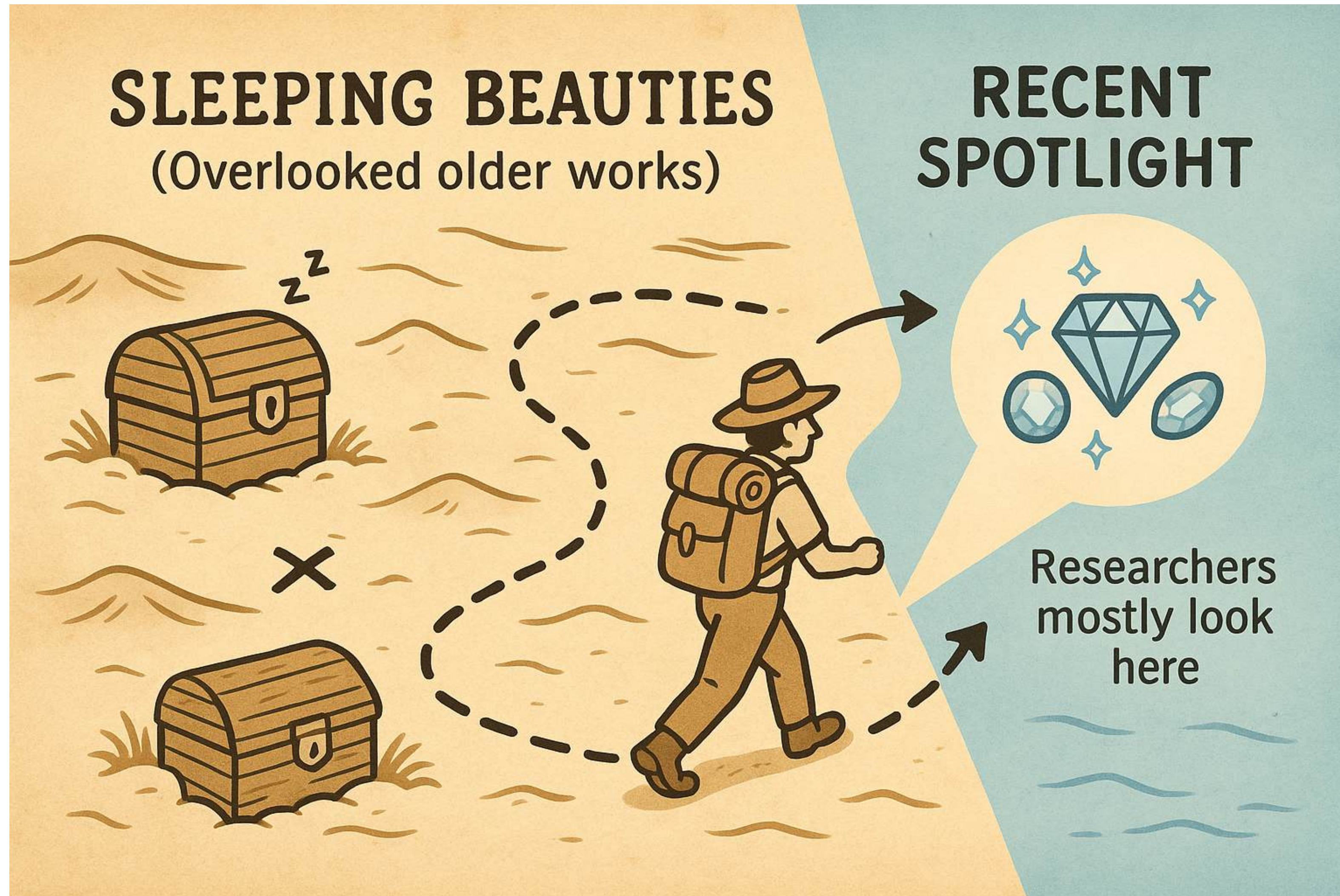
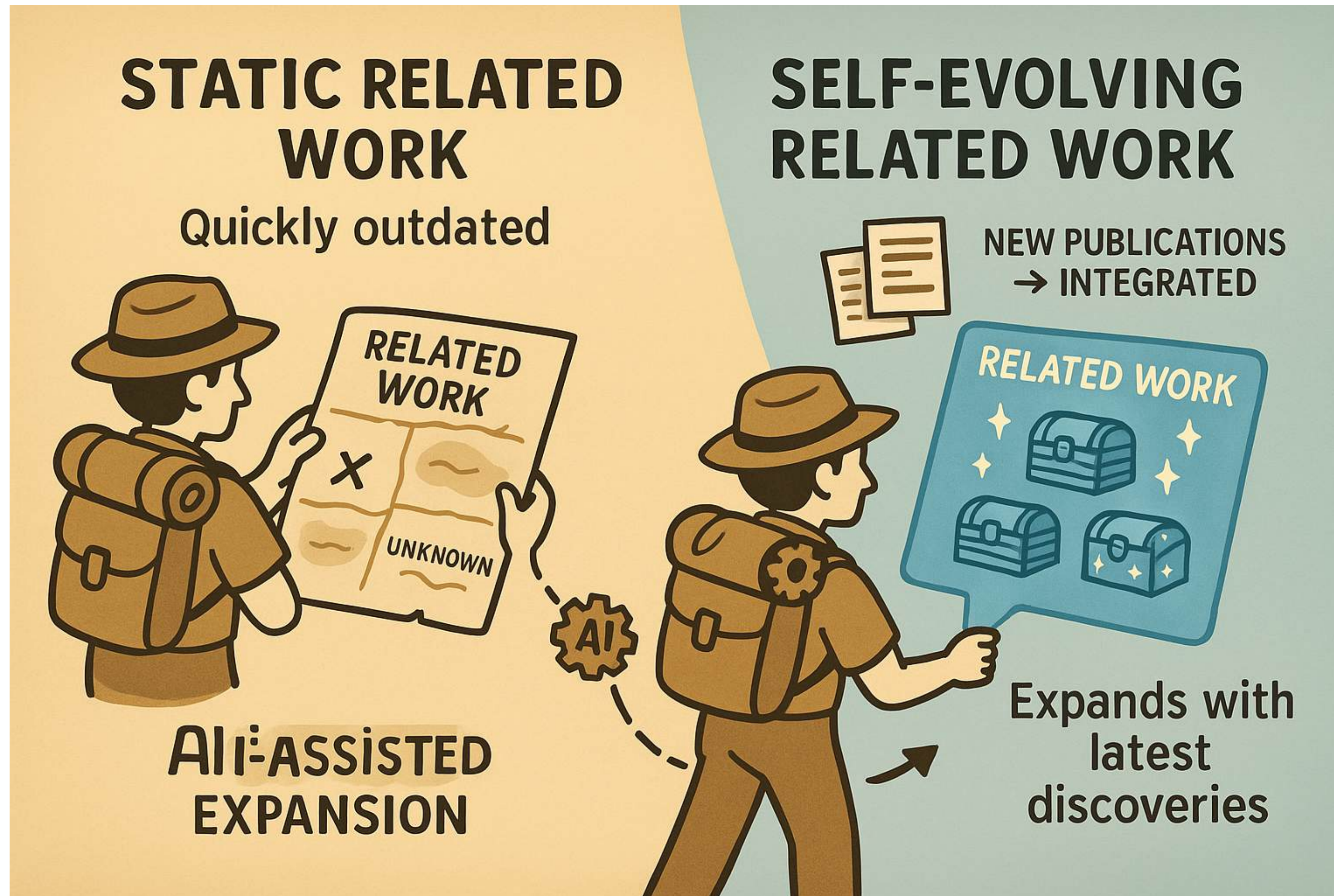


Image credit: DALL-E



# Project: self-evolving related work section





# Project: conflicting knowledge in literature

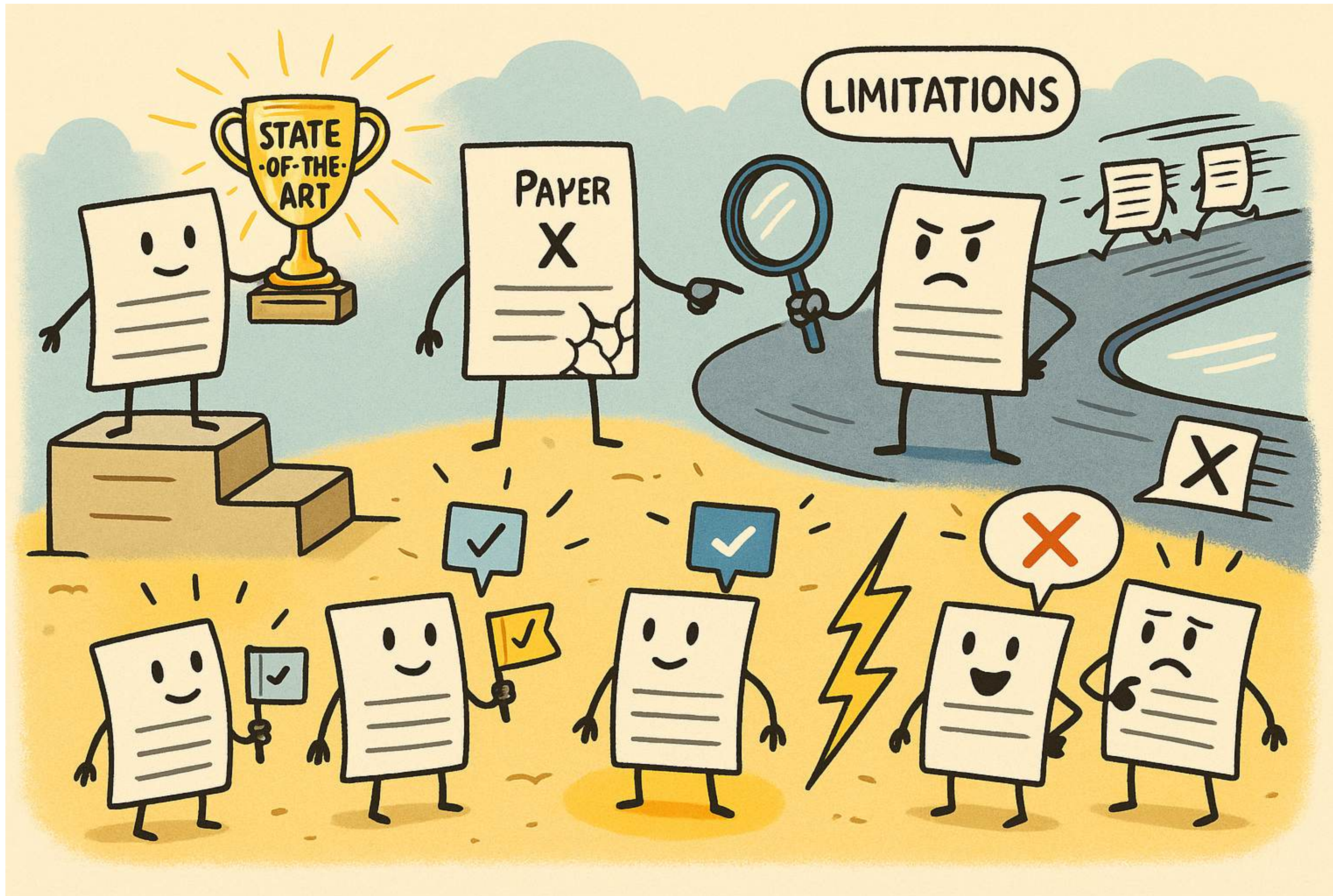


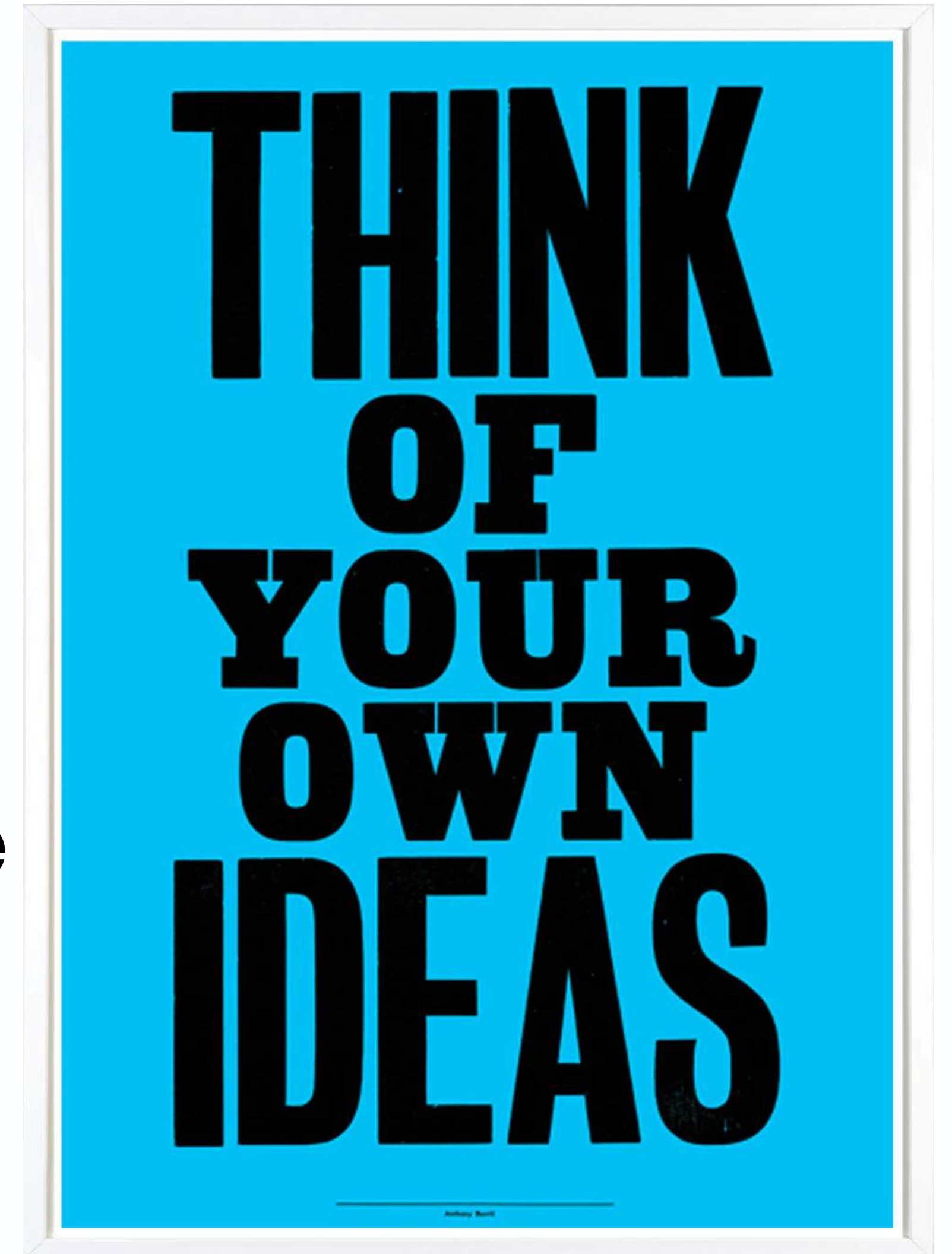
Image credit: DALL-E



# Your own project

Must-to-have components

- LLMs
- Temporal contexts
- Application domain of your interest
- Ideas are potentially exciting while feasible





**Go smaller but with a clear focus and  
in-depth analysis**

**Discuss your ideas with us**

**Biweekly or monthly meetings**



# Plagiarism and Generative AI

- With any plagiarism, you will fail the course
- Use Generative AI in a right way, and describe how you use it.



# Contact

[crosstemporalnlp@gmail.com](mailto:crosstemporalnlp@gmail.com)



# TODOs

- Deadline for topic selection
  - Presentation: 21 October 2025
  - Term paper: 28 October 2025



# Next week

- No lecture but watch workshop recordings
- <https://xtemplms.github.io/2025/program.html>
- <https://www.youtube.com/watch?v=Um27xolvBfc&t=9s>
- We meet again on 28 October 2025



# Course resources

- 3rd course edition
  - <https://github.com/andyweizhao/xtempnlp/>
- WS23-24 and WS24-25
  - <https://github.com/andyweizhao/diaclms/>





# Team

- Wei Zhao
  - Lecturer at the University of Aberdeen
  - Substitute lecturer at Heidelberg University
- Yujun Wang
  - PhD student at the University of Aberdeen
- Contact us if you are interested in a thesis project on this topic!

Thank you

