

# GenAI FOR EDUCATIONAL AND RESEARCH PURPOSES

Jasper Degraeuwe – 6 November 2025

GenAI @ VTC

# ABOUT ME

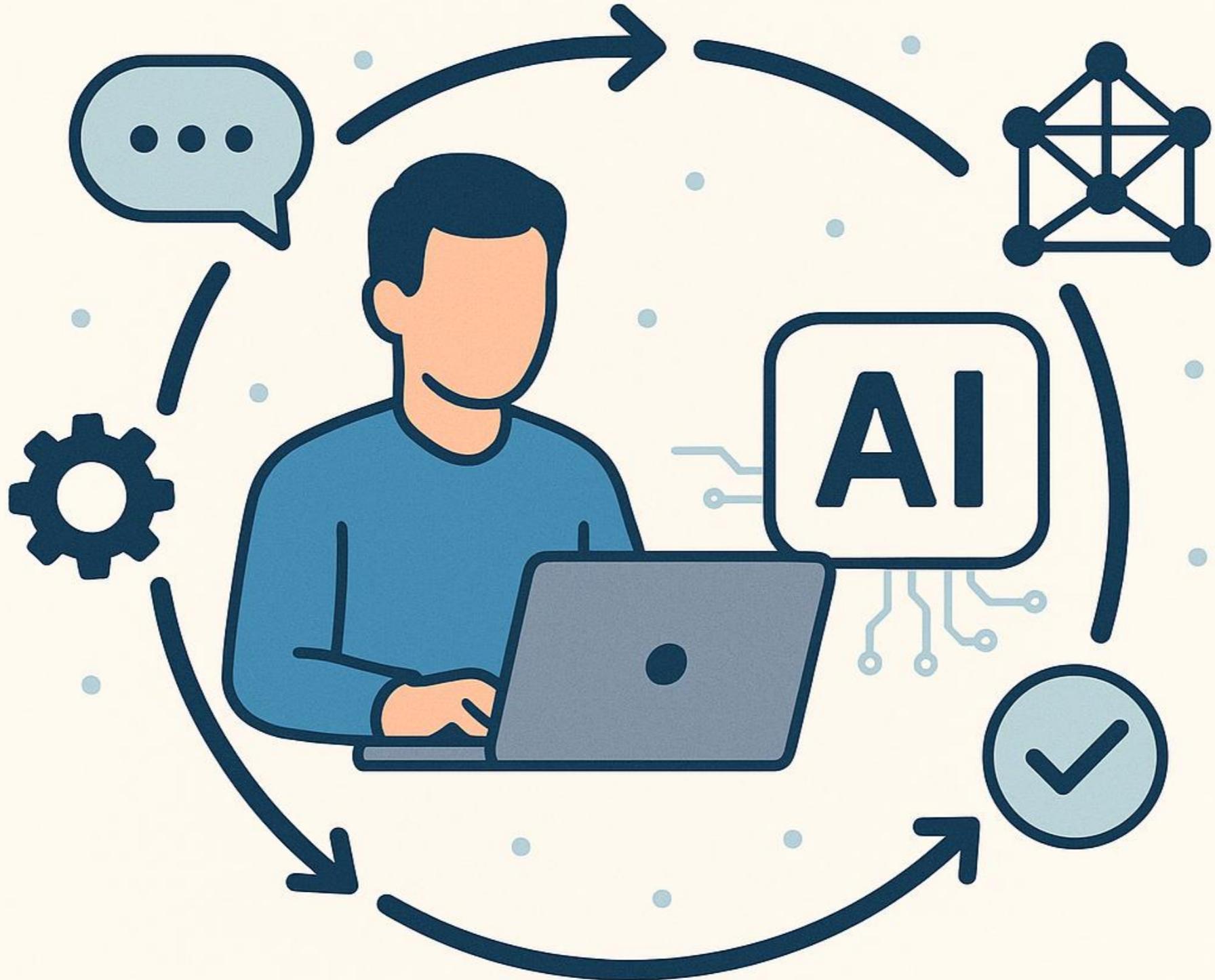
- Department of Translation, Interpreting and Communication
- PhD on **Intelligent Computer-Assisted Language Learning (ICALL)**  
ICALL ≈ CALL + AI and NLP
- Postdoctoral researcher on **educational technologies and AI for language learning**

# PUBLIC SERVICE ANNOUNCEMENT

# INTERESTED IN SUPPORT?

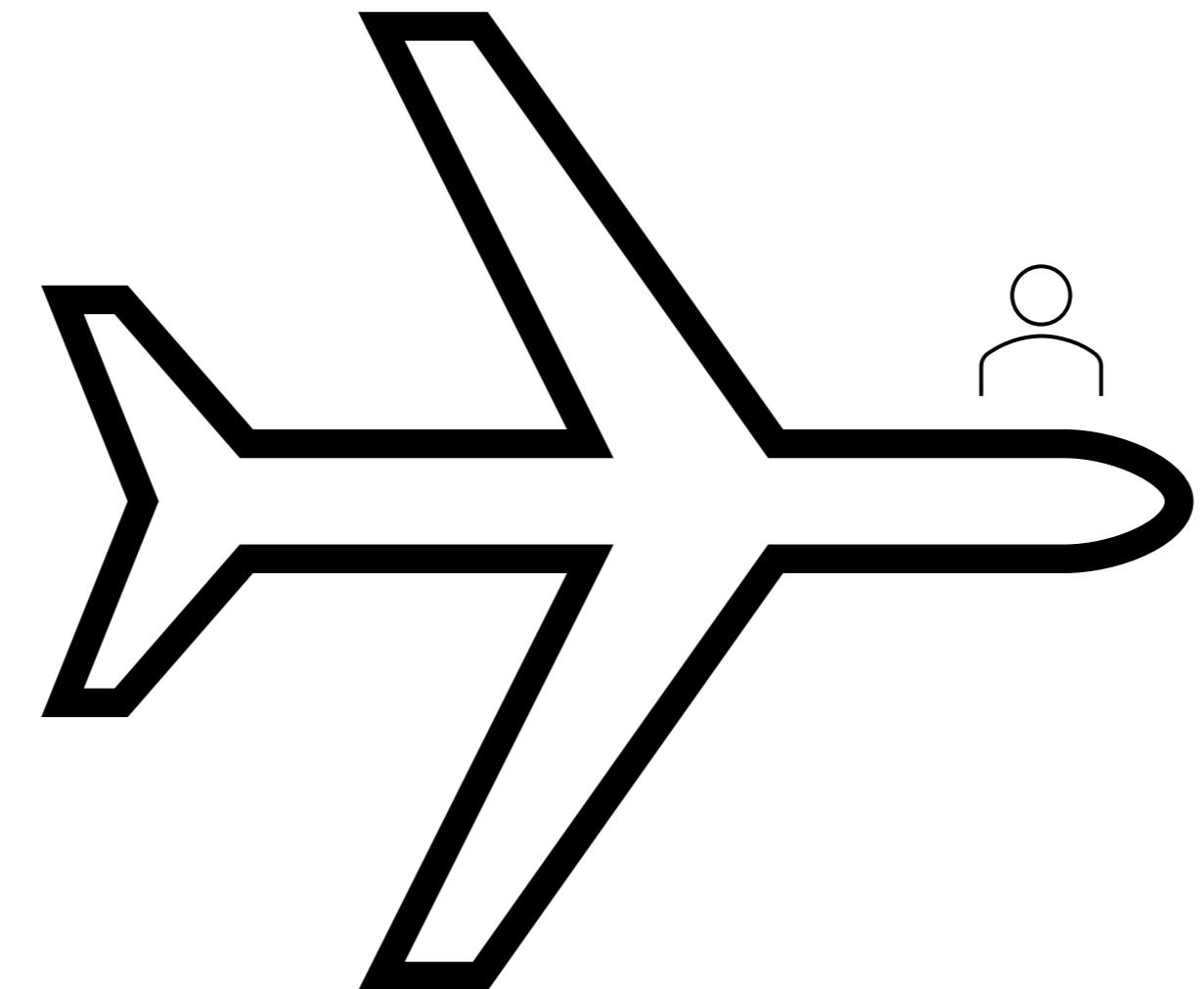
- Send email to [vtc.aisupport@ugent.be](mailto:vtc.aisupport@ugent.be)
- Include
  - Topic of bachelor paper / master's thesis
  - Short description of envisaged research
  - In what part of research planning to use GenAI and what type of support needed?
- **Before Friday 14 November 2025**

# DISCLAIMER



**HUMAN IN THE LOOP**

# HUMAN IN THE COCKPIT



# COGNITIVE COST OF BLIND AI USE

As the educational impact of LLM use only begins to settle with the general population, in this preliminary study we demonstrate the pressing matter to explore further any potential changes in learning skills based on the results of our study. The use of LLM had a measurable impact on our participants, and while the benefits were initially apparent, as we demonstrated over the course of 4 sessions, which took place over 4 months, the LLM group's participants performed worse than their counterparts in the Brain-only group at all levels: neural, linguistic, scoring.

# Taco Bell rethinks AI drive-through after man orders 18,000 waters

29 August 2025

Share  Save 

**Shiona McCallum** Senior Tech Reporter



Getty Images

# Meta investigated over AI having 'sensual' chats with children

18 August 2025

Share  Save 

**Charlotte Edwards** Technology reporter, BBC News



# ADDED VALUE OF AI “AUTOPilot”?

- Starting point: is use of AI necessary / beneficial?
- “Don’t ask ChatGPT how much  $2+2$  is” mindset
- Creating graphic in Excel versus creating graphic with AI-driven tool
- Talking to supervisor versus talking to general-purpose chatbot

# GUIDELINES ON GENERATIVE AI

# GHENT UNIVERSITY

- Overarching guidelines → “responsible” use is allowed
  - University: <https://www.ugent.be/genai>
  - Faculty: Ufora “[INFOSITE Faculteit Letteren en Wijsbegeerte](#)”
- ***Leerpad for teachers and for students (updated!)***
- Onderzoeks- en onderwijsstips (more *ad hoc*)
- Other workshops/courses (e.g., on UTOP)

**Responsible use of generative AI is always permitted unless a teacher explicitly prohibits its use for (part of) a task, in which case that task must be carried out in a controlled setting.**

## Generative AI at Ghent University

Ghent University has opted for allowing responsible use of generative AI. By responsible use, we imply the following core values:

- **Responsibility and independent action** – you are and remain responsible for what you do with the tools,
- **Honesty and critical attitude** – you check the reliability and source of the tools' output, in the context of copyright, and you are, where necessary, honest about the use of the tools,
- **Respectful use** – you are aware of possible prejudices and bias in the output of the tools,
- **Careful and sustainable use** – you weigh the potential efficiency gains from using AI against the energy consumed in generating these outputs.
- **Safe and confidential handling of information** – you do not upload confidential data.
- **Leading by example** – you embody these core values in the use of the tools and thereby set an example for others.

# FACULTY L&W

- Mandatory report for writing tasks
- Template and guidelines available on Ufora info site



# OVERVIEW

# OVERVIEW – GenAI FOR EDUCATION

1. Possibilities advanced tools
2. Prompting techniques
3. Retrieval-augmented generation

→ Hands-on and interactive!

# OVERVIEW – GenAI FOR RESEARCH

1. GenAI in pre-research phase
2. GenAI as part of research method
  - A. “LLM as a judge”
  - B. Synthetic data
  - C. Questionnaires
3. GenAI for data visualisation
4. Important observations / pitfalls

→ Hands-on and interactive!

# GenAI FOR EDUCATION

# 1. POSSIBILITIES ADVANCED TOOLS

# DEMOS

- Essay writing
  - Based on written or multimodal instructions
- Research papers (e.g., *masterproef*)
- “Study mode” in ChatGPT, “Learning mode” in Claude
- Generate notes for slides and/or slides themselves

# CONCLUSION

- Being aware of possibilities = being able to anticipate
- Adequate evaluation methods are essential
- Useful for preparing classes / coursebook materials?

## 2. PROMPTING TECHNIQUES

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)
- **Few-shot prompting** (= add series of examples to question)

# EXAMPLES



You

Give me three example sentences of no longer than 20 words that clarify the meaning and usage of the word "ubiquitous".



ChatGPT

1. Smartphones are now ubiquitous, found everywhere from bustling cities to remote villages.
2. The internet has made information ubiquitous, accessible to anyone with a connection.
3. Coffee shops are ubiquitous in urban areas, appearing on nearly every street corner.



# EXAMPLES

JA

## You

ubiquitous → Sentence 1: "Smartphones are now ubiquitous, found everywhere from bustling cities to remote villages." | Sentence 2: "The internet has made information ubiquitous, accessible to anyone with a connection." | Sentence 3: "Coffee shops are ubiquitous in urban areas, appearing on nearly every street corner."

nonplussed →



## ChatGPT

Sentence 1: "Despite her best efforts, Jane was nonplussed by the unexpected turn of events, unsure of how to react." | Sentence 2: "The politician remained nonplussed by the reporter's probing questions, maintaining a calm demeanor throughout the interview." | Sentence 3: "His nonplussed expression betrayed his confusion at the complex instructions given by his boss."



# 3. RETRIEVAL-AUGMENTED GENERATION

# RAG IN A NUTSHELL

- Input
  - Knowledge base
  - Prompt
- Output
  - Text / image / audio / ... that is generated using the knowledge base as the primary source

# RAG IN A NUTSHELL

- Most basic and straightforward form of RAG: attach document to prompt in chatbot interface
- Most advanced form of RAG: fully customised chatbot

# RAG: ADDITIONAL OBSERVATIONS

- Copyright issues
- Real-life use cases
  - Exercise generation
  - Exercise correction
  - Feedback generation
- ...

# RAG: LIVE DEMO

# CONCLUSION

- Useful if human in the loop
- Be aware that students can easily create custom chatbot too

# GenAI FOR RESEARCH

# 1. GenAI IN PRE- RESEARCH PHASE

# LITERATURE REVIEW

- Elicit
- SciSpace
- Perplexity with “Academic (Search academic papers)” functionality toggled on
- Copilot / ChatGPT / ... with “web search” and “deep research” functionalities toggled on

**! ONLY OPEN-ACCESS PUBLICATIONS**

# LITERATURE REVIEW: HUMAN IN THE LOOP

- Search Web of Science, Google Scholar, ...
- (Quick)read papers and look up relevant cited papers
- Meet up with supervisor
- Guidelines and tips & tricks offered during BAP / MAP courses
- Student is **responsible** for content of final product and is expected to **understand that content**

# FORMULATE RESEARCH QUESTION

= GenAI as idea generator

- Ask for summary of state of the art
- Ask for research gaps
- The more concrete the starting point, the better

## 2. GenAI AS PART OF RESEARCH METHOD

# A. LLM AS A JUDGE

## A. LLM AS A JUDGE

- LLM = large language model
- Core principle = using an LLM to evaluate data instances by scoring or labelling these instances
- Typically refers to judging quality of AI-generated content, but essentially applicable to any target setting

## EXAMPLE (AI-GENERATED CONTENT)

- **Question:** *Who is the president of the United States?*
- **Answers generated by LLM\_1**
  - A: Donald Trump
  - B: Donald Duck
  - C: A white-haired, orange-faced, old American citizen
- **Prompt to LLM\_2** (= the “judge”): *What is the best answer to the question and what is the worst answer to the question?*
- **Evaluation generated by LLM\_2:** best=A | worst=B

# EXAMPLE (RESEARCH DATA)

- Research data instances
  - A: Jasper and graphic design, a match made in hell
  - B: Jasper and graphic design, room for improvement
  - C: Simply the best: Jasper revolutionises world of graphic design
- Prompt to LLM (= the “judge”): *What headline has the most positive sentiment towards the subject’s graphic design skills and what headline has the most negative sentiment?*
- Evaluation generated by LLM\_2: best=C | worst=A

# WHEN POTENTIALLY USEFUL?

- Large digital dataset (text, images, audio, video) to which you want to apply time-consuming and/or labour-intensive analysis
- AI can analyse huge amounts of data in very little time  
→ enables you to analyse more data

## TYPE OF DATA TO WHICH POTENTIALLY APPLICABLE

- “Raw” corpora (diachronic, subtitles, transcriptions, student essays, ...)
- Large collection of instances including a particular linguistic phenomenon
  - Sentences with particular syntactic structure
  - Sentences containing lexically ambiguous word

## TYPE OF DATA TO WHICH POTENTIALLY APPLICABLE

- Parallel corpus containing source-target translation pairs
- Word lists
- Questionnaire responses

# “JUDGING” METHODS: COMPARATIVE

- Best-worst scaling (see example presented earlier)
- Pairwise comparison without reference
  - *Which of the following two utterances is the most gender-inclusive?*
- Pairwise comparison with reference
  - *Consider the following sentence: [...] Which of the following two sentences is most similar to this reference sentence?*

# “JUDGING” METHODS: LABELLING

- Binary
  - *Is the meaning of the original text preserved in the translation? → YES or NO*
- Categorical
  - *Does this utterance express a positive, neutral, or negative sentiment?*
  - *Which sense of bank is intended in this sentence? Choose between [...]*
- Numerical
  - *Rate the following paragraph in terms of inclusive language on a 1 to 5 scale.*

# ALSO QUALITATIVE ANALYSIS!

- Content analysis (e.g., of interview transcripts)
- Procedure of the analysis (e.g., extracting specific type of information, applying coding scheme, critical discourse analysis) is included as part of prompt
- **NOTE:** if data not protected by model provider → **remove personal and sensitive data**

# STRUCTURE OF PROMPT FOR QUALITATIVE ANALYSIS

## – System prompt

*You are a researcher, specialised in [...]. You will be asked to perform a qualitative analysis on an interview transcript. Your task is to extract [...] from the transcript / label the transcript based on the following coding scheme [...] / ...*

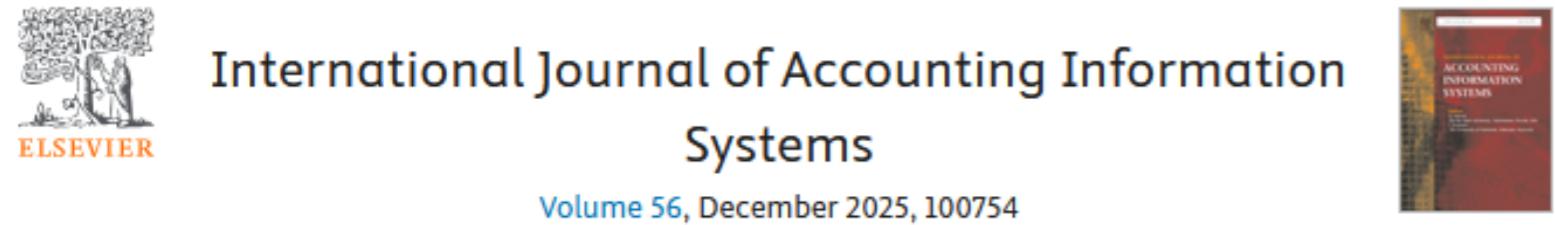
## – User prompt

*Interview transcript to be analysed: [...]*

*Required output format: [...]*

*Example of required output format: [...]*

# QUALITATIVE CODING: DEMO



## A practical guide to implementing ChatGPT as a secondary coder in qualitative research ☆

Eva Blondeel, Patricia Everaert, Evelien Opdecam

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<https://doi.org/10.1016/j.accinf.2025.100754>

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The use of GenAI as a secondary coder in qualitative research

Eva Blondeel (UGent)

The use of GenAI as a secondary coder in qualitative research

Watch on YouTube

PEERS & PROMPTS

AI-inspiratie voor het hoger onderwijs

<https://www.sciencedirect.com/science/article/abs/pii/S1467089525000302>  
<https://www.vaia.be/nl/opleidingen/ai-inspiratie-oktober-2025>  
[https://www.youtube.com/watch?v=sK\\_sV0dn6q4](https://www.youtube.com/watch?v=sK_sV0dn6q4)

# ALSO DATA PROCESSING / FILTERING!

1. Raw corpus (e.g., parallel corpus of dialogues linked to their subtitles)
2. Only interested in utterances containing **particular phenomenon that cannot be identified with simple rules** (e.g., humour) → GenAI-driven labelling
3. Filtered dataset containing data instances you were looking for

# LIVE DEMO

- Categorical labelling
- If time at end of the session: more demos available  
(best-worst scaling and pairwise comparison)

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)
- **Few-shot prompting** (= add series of examples to question)

# WHERE IS THE HUMAN IN THE LOOP?

- Take subset from the dataset and apply same type of analysis but now with human participants
- Calculate correlation / overlap between human and AI judgements
- Negative results: also valuable!

## B. SYNTHETIC DATA

# WHEN POTENTIALLY USEFUL?

- You need more data than you can gather / than is available
- AI tool can take over part of data collection process by **generating data that is similar to reference data or data that complies with series of criteria included in prompt**
- Typically for training or testing (machine learning) models

# PROMPTING TECHNIQUES

- Zero-shot prompting (= ask question without giving any additional context)
- **Few-shot prompting** (= add series of examples to question)

## EXAMPLE AT VTC

- Automatically create suitable practice speeches for conference interpreting training programmes

## C. QUESTIONNAIRES

# WHEN POTENTIALLY USEFUL?

## STEP 1

- Look for existing (validated) instruments / questionnaires
- Approach (see also section on literature overview):  
combination between manual search and prompting GenAI  
model (“*Give me five existing, recent instruments on [...],  
describe how frequently they are used, and list their pros  
and cons.*”)

# WHEN POTENTIALLY USEFUL?

## STEP 2

- Generate first draft of survey questions based on your research objectives, target population, and key variables (“*Create a 10-question survey about ...*”)
- Suggest question types (yes/no, Likert, open text, ...)
- Rephrase questions
- Check if questionnaire meets regulatory requirements (e.g., GDPR)

# ALL-IN-ONE FORMULA

- Qualtrics (survey tool for which UGent bought a license) is introducing AI functionalities

# 3. DATA VISUALISATION

# WHEN POTENTIALLY USEFUL?

- Complex spreadsheet data
- Infographics / visuals
- Assistant while making slideshow presentation

# WHEN OVERKILL?

- Basic pie/bar charts based on spreadsheet data
- When you can tell your story with existing icons and/or images

# (NON-EXHAUSTIVE) OVERVIEW OF TOOLS

## SPREADSHEET DATA

- All-purpose AI assistants (Copilot, Perplexity, Le Chat, Claude, ChatGPT, ...)
- [Julius AI](#)
- [ChartGPT](#)
- [Tableau](#) (mainly for businesses)

# (NON-EXHAUSTIVE) OVERVIEW OF TOOLS

## INFOGRAPHICS

- All-purpose AI assistants
- [Canva AI](#)
- [NotebookLM](#)
- [Piktochart](#) (also for [educators](#))
- [Venngage](#)

# ONE STEP FURTHER

- If you have some programming knowledge
- Create single graphics / complete notebooks
- Start from your own code and ask GenAI model (e.g., Claude) to refine it or change it for other type of graph
- Ask GenAI model to write code from scratch based on detailed prompt
- **Not necessary to share actual dataset!**

# 4. IMPORTANT OBSERVATIONS / PITFALLS

# IMPORTANT OBSERVATIONS

- Write clear instructions and always provide examples
- **Provide your data to model in most structured way possible (CSV, JSON, ...)** and **ask model to return output in equally structured way**
- Be careful when introducing personal data into AI-tools  
→ **always anonymise / pseudonymise**

# PITFALLS

- Bias in models (e.g., gender bias)
- Concept of “authentic data” from online sources

# PITFALLS

+ Rusland injecteert zijn propaganda in westerse AI-bots zoals ChatGPT



Een billboard in Moskou met daarop een Russische soldaat en het opschrift 'Pride of Russia'. © getty

Source: De Standaard

# ONE MORE TIME:

# OVERVIEW OF AI SUPPORT

# CHANNELS

# RELEVANT SOURCES

- UGent page on GenAI
- Ufora info sites and *leerpaden*
- Website on AI-driven tools and resources for (language) education: <https://vakgroep-vtc-universiteit-gent.github.io/>

**AI is like teenage sex:**  
*“Everyone talks about it,  
nobody really knows how to do it,  
everyone thinks everyone else is  
doing it, so everyone claims they  
are doing it.”*

Credit: Dan Ariely

# Jasper Degraeuwe

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