AI patiënt voor onderwijs en opleiden: pAItient simulator / KARLA communicatie & klinisch redeneren

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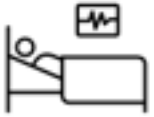
Overzicht

- Aanleiding
- Doel
- Plan & samenwerking
- Team
- Vragen

Context

Hoogwaardige kwaliteit zorg en effectieve anamneses vereisen goede communicatie & klinisch redeneer vaardigheden >

- Welzijn en tevredenheid patiënt



- Afgestemd op individuele patiënt

- Juiste diagnose

Huidige situatie - studenten oefenen (met acteurs of docenten):

- Stressvol
- Beperkt tijd (acteurs en docenten)
- Weinig ruimte om te oefenen en experimenteren

Doel

Ontwerpen van AI patiënt om communicatie vaardigheden & klinisch redeneren te oefenen

- Aanvullend op acteur gesprekken en onderwijs klinisch redeneren
- Vaker oefenen, op eigen tempo
- Locatie onafhankelijk
- Beter voorbereid > optimale inzet acteurs en docenten

Interface: gebruik van verschillende casussen & situaties

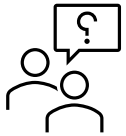
Gebruiker:

Login

Inhoudelijke patiënt casus

Gedrag en/of modus





Gesprek met AI patiënt

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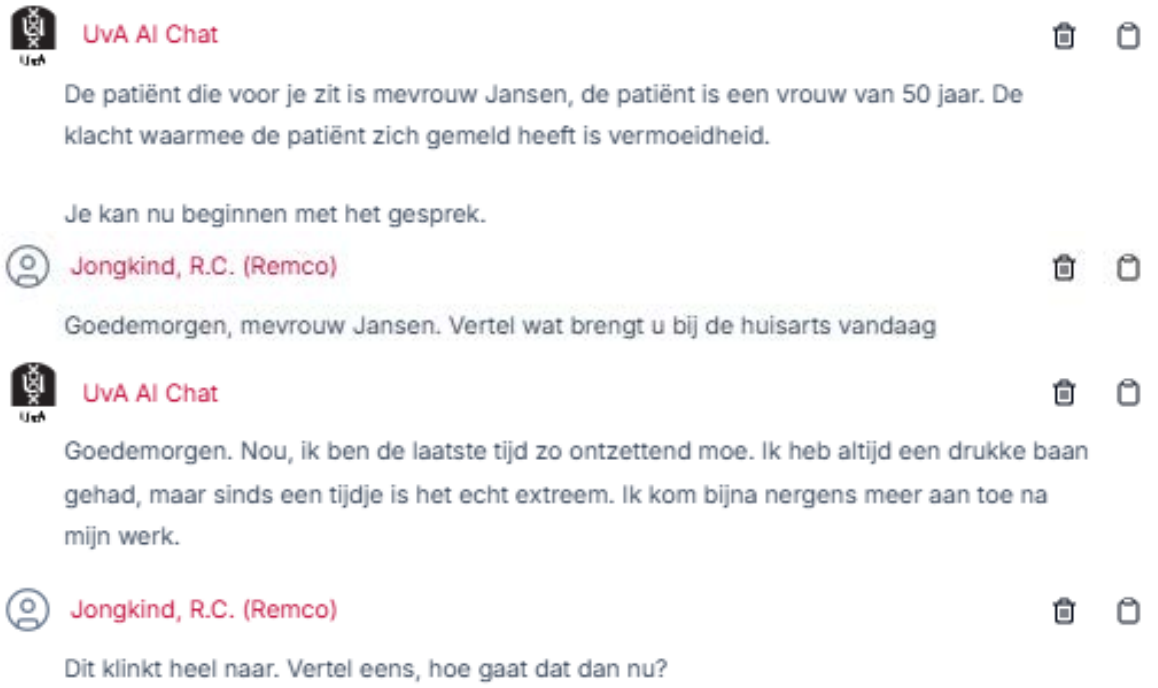
AI patiënt en casussen

- Ontwikkelen prompts (instructies) voor GenAI avatar om zich te gedragen als patiënt.
- 15 GenAI bruikbare inhoudelijke casussen ontwikkelen
- Ontwikkelen feedback module, waarbij de student feedback kan krijgen op het gesprek.

Huidig - 1 casus, communicatie via typen:



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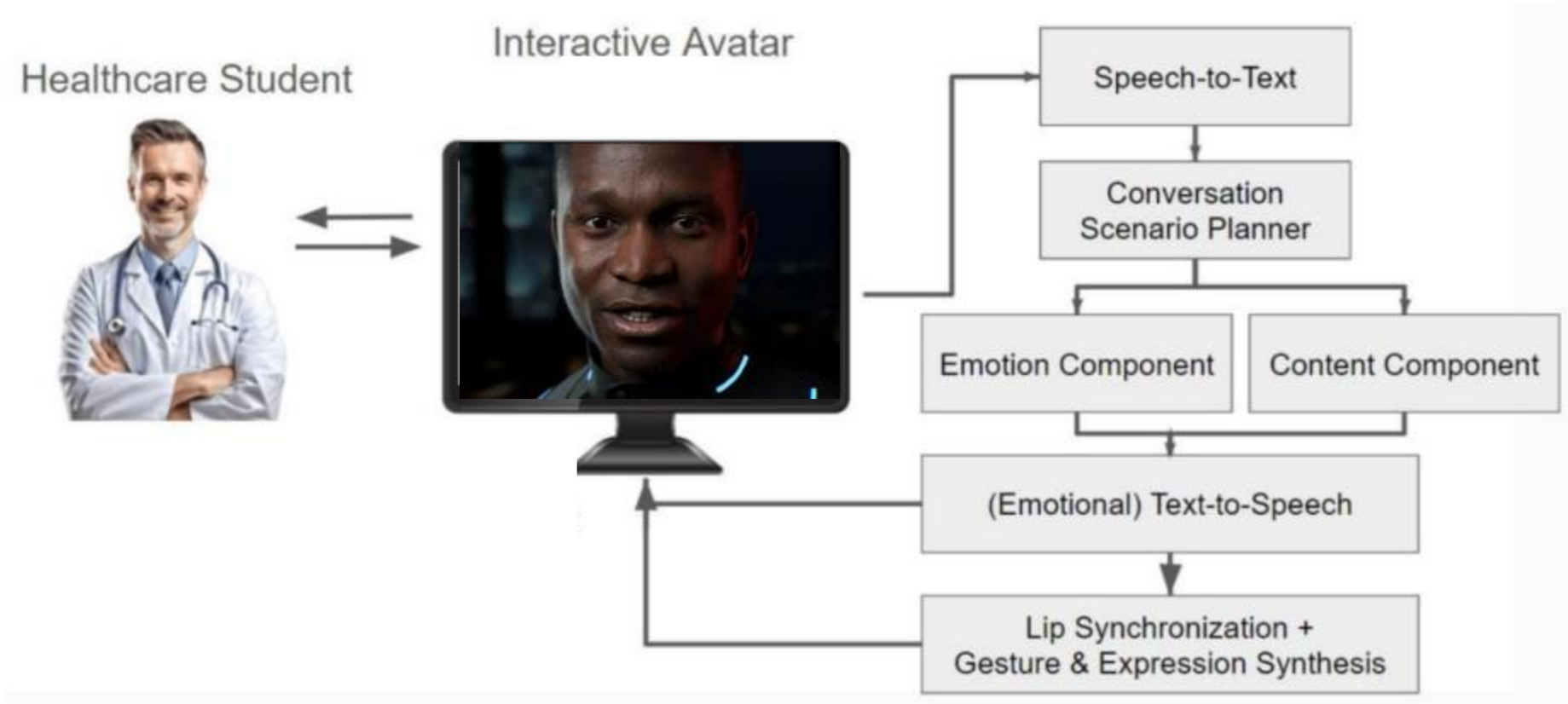
Virtuele avatar



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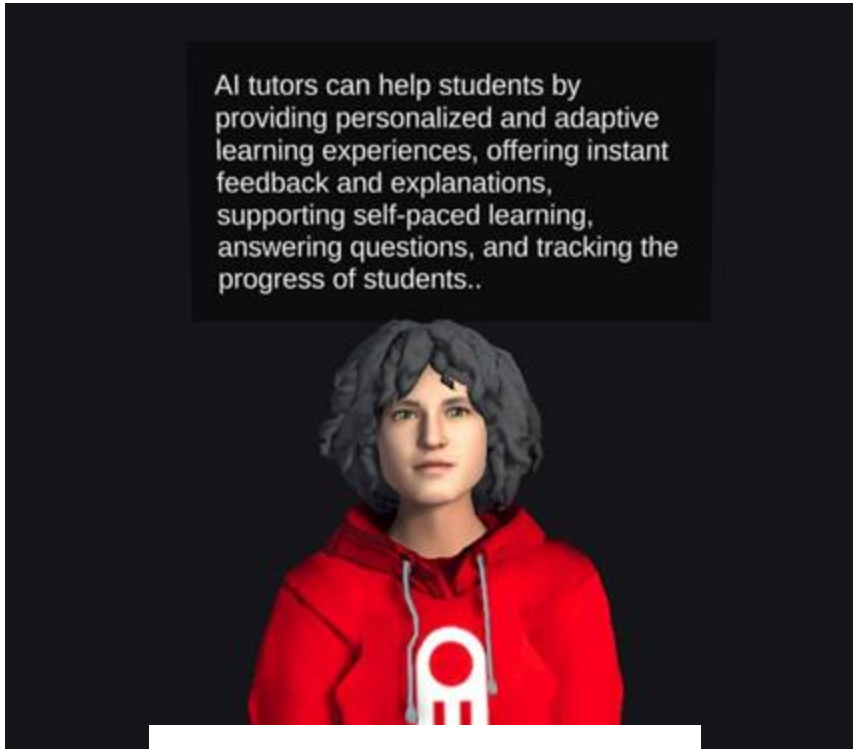
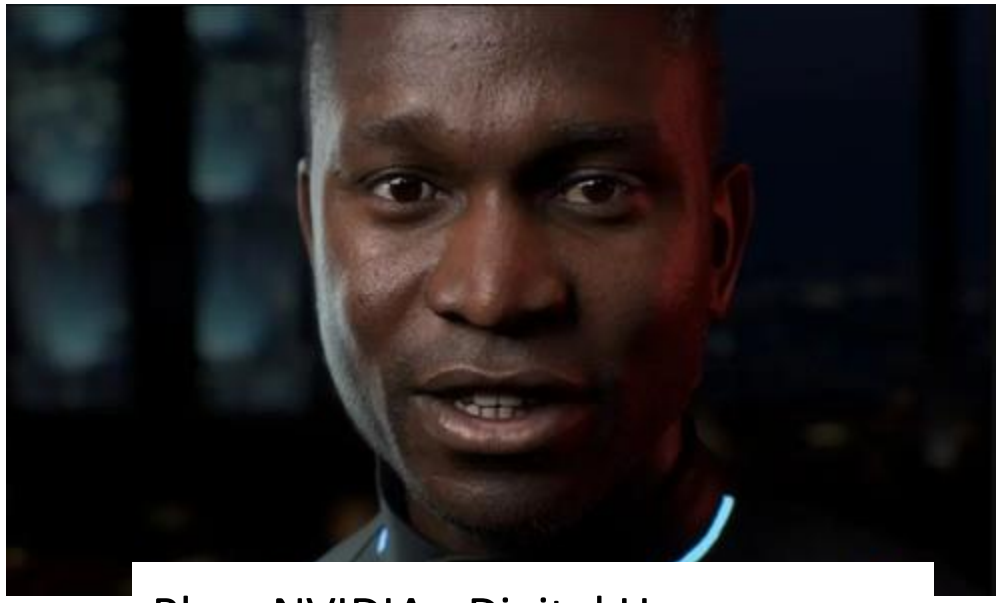
Virtuele avatar



Huidig: ART (Unity)



Plan: NVIDIA - Digital Humans

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KARLA: Klinisch AI-gestuurd Redeneren Leer Applicatie

KARLA: vragen aan student

KARLA: studenten laten nadenken

- Extra uitleg
- Bronvermelding

Onderwijs implementatie

Bsc UvA/VU

- Voorbereidend op acteur gesprek

- Voor of na klinisch redeneren les
- Voorbereiding op vaardigheden toets

- Doorlopend oefenen waar gewenst

Msc UvA

- Lijn consultvoering jaar 1, 2 en 3.

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Onderwijs evaluatie

- Bepalen effectiviteit leerrendement
  (i.s.m. Suzanne Geerlings – hoogleraar Kwaliteit van Zorg)

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Samenwerking UvA-VU

Toegevoegde waarde ten opzichte van oorspronkelijke UvA aanvraag:

1. AI patiënten aan beide kanten van de Amstel geïmplementeerd
2. Leermodus voor klinisch redeneren – studenten met socratische vragen door het proces nemen en extra uitleg geven.
3. Ervaring met bredere implementatie > betere schaalbaarheid later.

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Bredere inzet & valorisatie

Inzetten in de rest van het Amsterdam UMC (communicatie)

- Neurochirurgie (Sander Idema)
- Huisartsgeneeskunde (Eva Hoff)
- Medische psychologie (mede-aanvrager)
  Programmaleider medische communicatie Medische Vervolg Opleidingen leerhuis.

- Open access beschikbaar stellen voor andere UMC's (communicatie en KR)
  Reeds interesse Leiden, Groningen, Maastricht, Nijmegen.

- Evalueren van toegevoegde waarde van VR bij oefenen gesprekken

- Ondersteuning & support via UvA ICTS & Amsterdam UMC (UvA en VU) ICTO.

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Amsterdam UMC (UvA)

Jennita Meinema (onderwijskundige)

Remco Jongkind (projectleider & GenAI SIG voorzitter)

Eline Verberne (arts)

Suzanne Geerlings (Hoogleraar Kwaliteit van Zorg)

Robert Hulsman (communicatie docent)

Inge Henselmans (coördinator communicatie onderwijs)

Miljenko Bojcic (ICTO)

Tom Broens (Hoofd TLC)

Externe partners

Deniz Iren
Open Universiteit – Associate professor Affective computing

Software ontwikkelaar

Roland Klemke
Hoofd Educational Game Lab KU Keulen

Amsterdam UMC (VU) - KARLA

Franciska Koens	Onderwijskundige/projectleider
Cor Camps	Stafadviseur ICT en onderwijs
Tommy Pattij	Coördinator leerlijn academische vorming
Michiel van Agtmael	Internist/hoogleraar klinische farmacologie en farmacotherapie onderwijs
Marije Bomers	Internist-infectioloog
Lars Maas	Masterstudent geneeskunde
Silvester Draaijer	Programma manager/Ed-tech expert VU
Skadi Spindler	Universitair docent afdeling fysiologie
Susan Ruitenberg	Coördinator lichamelijk onderzoek
Paul Houben	Huisarts, coördinator leerlijn medisch expert
Jack van Horssen	Directeur Ba opleiding geneeskunde VU
Alexander Bijnsdorp	Arts-anatoom
Marielle Hartjes	Promovenda farmacotherapeutisch redeneren

Samenvattend – concrete opbrengst

1. AI patiënt met virtuele avatar om >15 diverse casussen mee te oefenen.
2. Geïmplementeerd in UvA + VU Bsc en UvA Msc anamnese onderwijs.
3. Klinisch redeneer tutor modus
4. Zicht op bredere toepassing van AI in communicatie training in het Amsterdam UMC.
5. Open access beschikbare infrastructuur voor andere faculteiten en afdelingen.
6. Profilering Amsterdam UMC als vooruitlopend in GenAI in onderwijs & zorg.

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Vragen?
Bedankt voor jullie aandacht.

Overwegingen & validatie criteria bij GenAI inzet & ontwerp

Overwegingen:

1. Effect op het leren (autonomie, cognitieve ontwikkeling and complacency, kritisch denken)
2. Opleidingsvisie (gewenste leeruitkomsten, nationale kaders en wensen werkveld)
3. Privacy / data veiligheid
4. Beschikbaarheid van en toegang tot benodigde infrastructuur

Validatie punten:

1. Repliceerbaarheid & reproduceerbaarheid
2. Didactische uitgangspunten
3. Red teaming
4. Bias
5. Milieu impact
6. Effectiviteit van de leerinterventie

Backup slides

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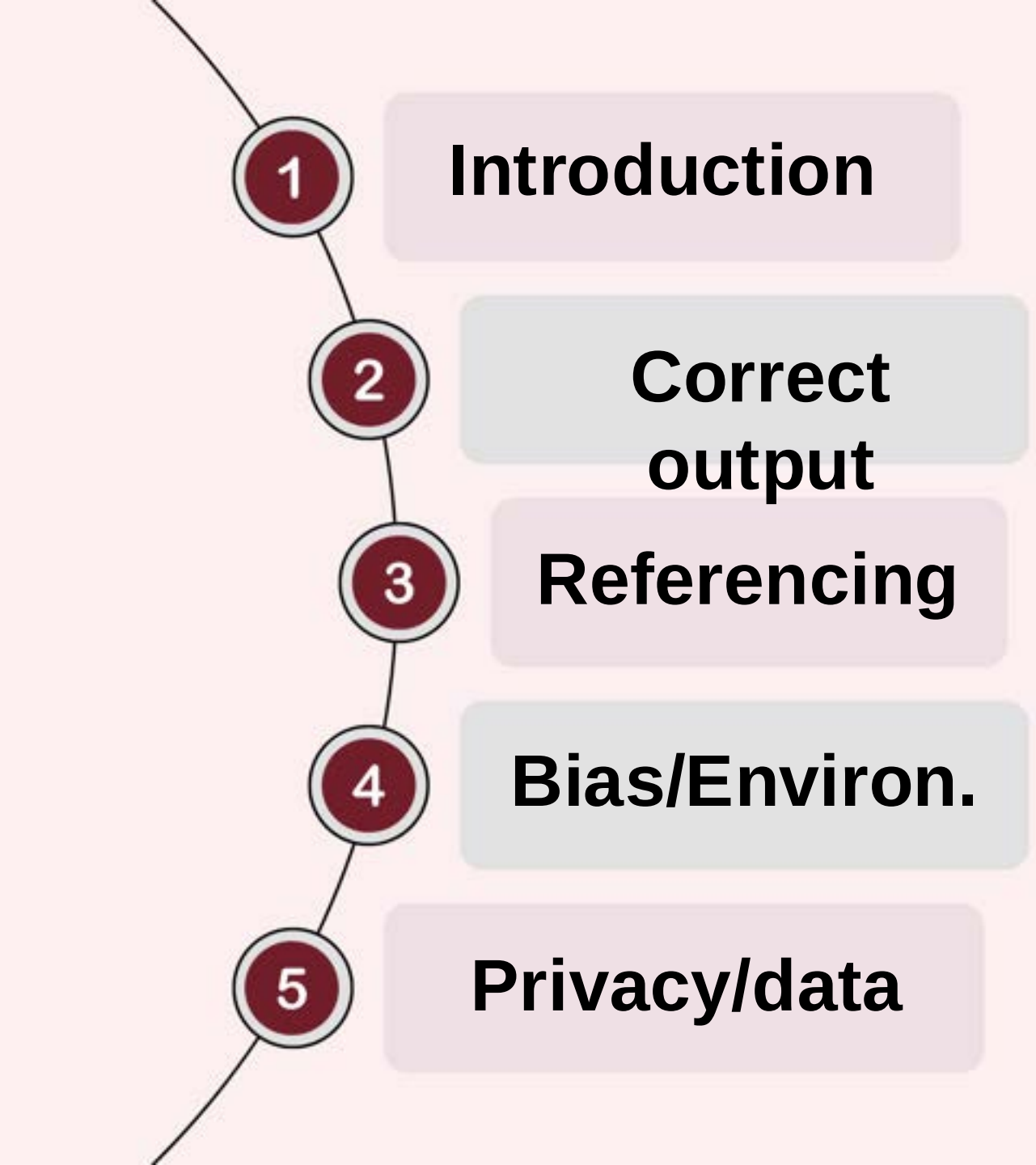
Responsible and effective use of GenAI

Remco Jongkind
Teaching & Learning

Content overview



How does a large language model work?

- Data, lots of data
- Patterns
  - Language structure: the student reads in the library
  - Context: a book lies on the shelve
  - Rules: apple is a fruit
- Prediction of answers, no database

- The dog [xxx] in his basket
- Sits, stands, lies

Questions – Gen AI use

- Wooclap: RFHBMO
- Until question 4

UvA policy

- Don’t use Gen AI-tools to make assignments you will hand in.
- Don’t enter sensitive information into a model which uses input for training:
  - Research data
  - Patient information
  - Personal details
- Don’t use your UvA email

(additional) FdG policy

- Don’t use Gen AI tools for an assignment, unless the coordinator/lecturer indicates otherwise in the assignment on canvas

- This week you can use Gen AI for all aspects of the assignment

Questions – Gen AI output

- Wooclap: RFHBMO
- Question 5

Evaluating Gen AI output

Casus 1 - True / not true

- Amsterdam UMC has an underground research facility for experimental medicine.
- Amsterdam UMC is the largest academic hospital in the Netherlands.
- Amsterdam UMC offers a free health check for all residents of Amsterdam.
- Amsterdam UMC has a special program for patient-centered care.
- Amsterdam UMC has the largest organ transplant department in Europe.
- Amsterdam UMC has an annual open day where visitors can attend operations.
- Amsterdam UMC has an internationally recognized program for cancer research
- Amsterdam UMC has a special team that uses AI and robots to treat patients.

Casus 1 - True / not true

- Amsterdam UMC has an underground research facility for experimental medicine.
- Amsterdam UMC is the largest academic hospital in the Netherlands.
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Scientific integrity

You take responsibility for the content of your product

- Careful – I have verified the content
- Transparent – I indicate what my source is

Example of a lawyer from the US

Critically evaluate output:

- Check the source
- Understand limitations
- Judge logical consistency and use own knowledge
- How recent is the model/training data

Look for possible biases

Questions to ask

- Does it matter if its true?
- Do I have the knowledge to assess if its true?
- Can I take responsibility?

Refer to Gen AI use

Options:

- Referencing (OpenAI, 2024)
- Describe in method
- Add chats in appendix

Refer to Gen AI use

Options:

- Referencing (OpenAI, 2024)
- **Describe in method**
- **Add chats in appendix**

Questions - prompting

- Wooclap: RFHBMO
- Question: 6

Reduce errors

- Use right model and language
- Give it source documents
- Prompting:
  - Give sources
  - Indicate if it does not know
  - Concrete, specific prompts

Reduce errors with prompts

PROMPT

Act like a {ROLE}, I need a {NEEDS}, you will {TASK}, in the process, you should {Details}, please {DO NOT...}, input the final result in a {FORMAT}, here is an example: {Examples}

Reduce errors with prompts

PROMPT

Act like a {ROLE}, I need a {NEEDS}, you will {TASK}, in the process, you should {Details}, please {DO NOT...}, input the final result in a {FORMAT}, here is an example: {Examples}

EXAMPLE

Act like an SEO professional writer, I need an optimized blog post, you will research keywords and incorporate them naturally into the content, in the process, you should focus on readability, relevance, and proper keyword placement, please avoid keyword stuffing or over-optimization, input the final result in a well-structured format, here is an the title: 'Top 10 Tips for Effective SEO Writing: Boost Your Content's Visibility.

Example of specificity

From: The scientific relevance is clear.

To: The scientific relevance of the research question is clear:

- The thesis cites recent, relevant academic articles and sources (ideally published within the last 5 years) to demonstrate current knowledge.
- It includes a critical review of ideally at least 3-5 key pieces of literature, identifying strengths, weaknesses, and debates among scholars.
- Specific discussions or controversies within the field are highlighted, showing an understanding of the ongoing academic conversation.
- The thesis explicitly identifies a specific gap or unresolved question.
- It maps out the research landscape, for example using visual aids like diagrams or tables, to show where the research question fits.
- The text explicitly states something along the lines of, "This research addresses the following gap/unresolved issue in the field..."
- It compares the research question's perspective with existing viewpoints in the literature, highlighting differences and novelties.
- If the thesis is an empirical study, ideally where possible, preliminary data or preliminary analysis is presented to justify the viability of the new perspective or challenge.

Questions – ethical considerations

- Wooclap: RFHBMO
- Question 7, 8, 9

Environmental impact

- Training of models (once)
- Use (per input/output)

Environmental impact - training

- Example training:
  GPT4o – 4000 ton CO_2 eq.
- 22.2 g / user

Comparison:

- ≈ yearly CO_2 footprint of 200 Dutch households
- ≈ 10% of yearly CO_2 footprint of the UvA
- ≈13 min youtube video / user

Environmental impact - use

- Example use:
  - GPT4o – 4.3g CO_2 eq. per average text prompt
  - GPT4o – 258g CO_2 eq. per average image

- Comparison with text prompt:
  - 1 prompt≈20 Google searches
  - 1 prompt≈2.5 min Youtube clip

Environmental impact - use

- Example use :
  - GPT4o – 4.3g CO2 eq. per average text prompt
  - GPT4o – 258g CO2 eq. per average image

- Comparison text prompt:
  - 1630 prompts ≈ 1 new cotton t-shirt
  - 326 prompts ≈ 10 km driving by car
  - 1.000.000 prompts ≈ 1 return flight NL-Japan

Copyright

- Training of model on copyrighted material
- Copyright regarding inputs

Privacy/data security
Casus 2

- Can I use ChatGPT (free version) to upload:
  - Study materials of canvas?
  - My thesis?
  - Articles from pubmed?
  - Text from a website?
  - My own essay?

Privacy/data security
Casus 2

- Can I use ChatGPT (Plus, paid version) to upload:
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Privacy/data security
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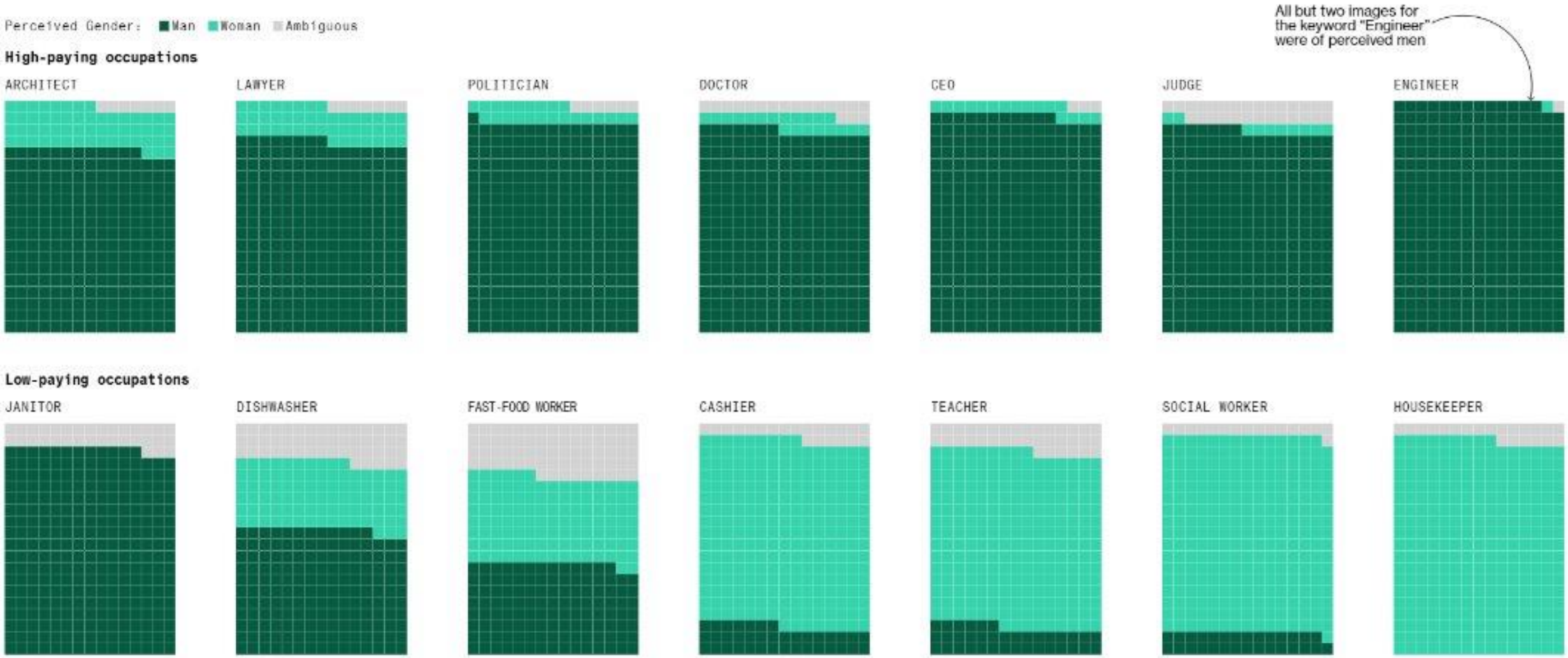
Privacy/data security
Casus 2

- Do I want to use ChatGPT (free version) to upload my own essay?

[Bloomberg 2023]



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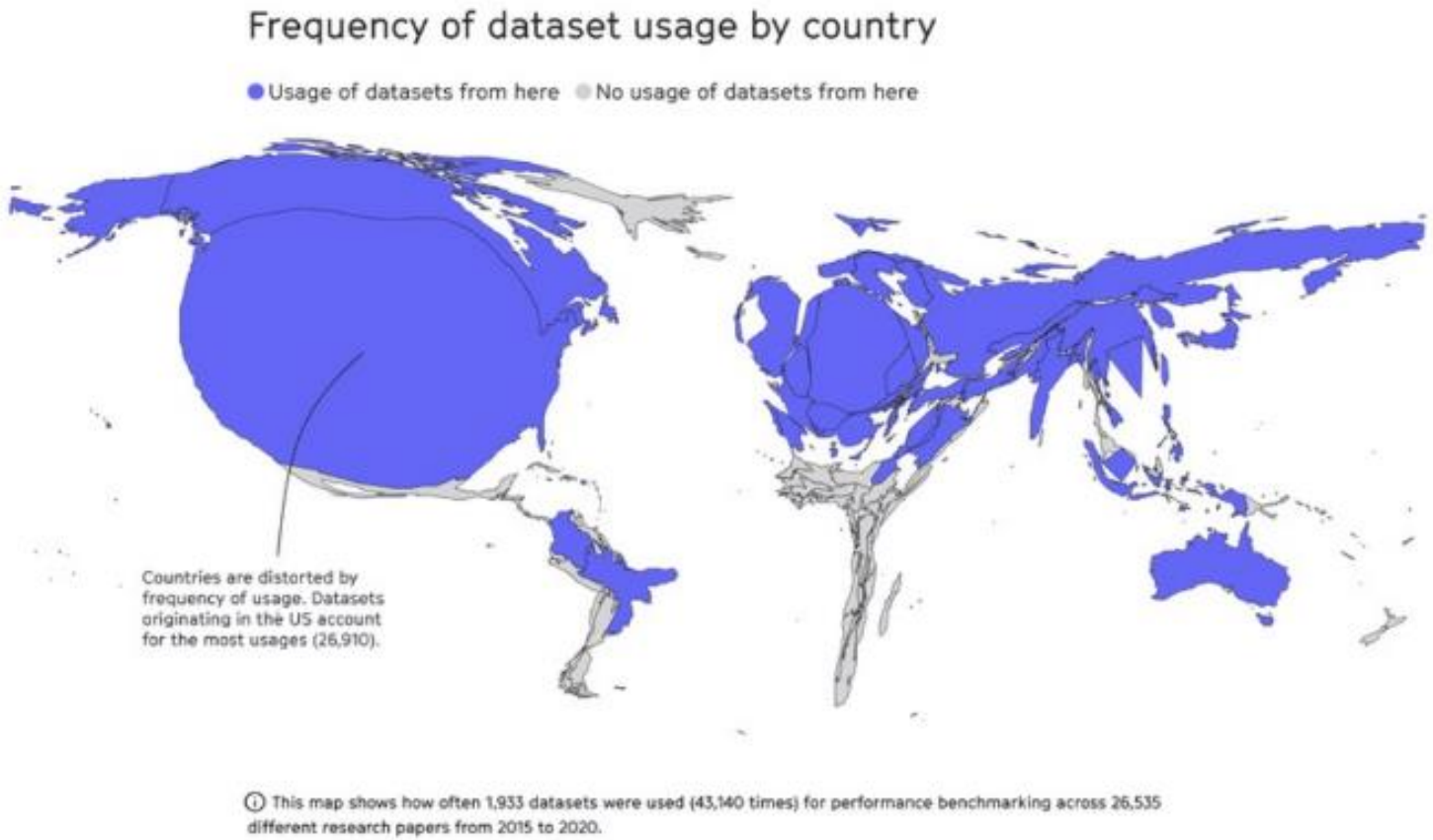

[Internet Health Report]

Case 3 - Recognizing and correcting for potential bias

- Grade an essay handed in by a student
- GP intake tool – How quickly should a patient get an appointment for a pain complaint?
- Gen AI study advisor – Which courses should I pick?

Questions – Gen AI use for tasks

- Wooclap: RFHBMO
- Questions 10, 11, 12

Development of skills

- Many opportunities, but:
- Watch out for (too much) use:
  - Learning something (unfortunately) costs effort (1)
  - Potentially not developing skills
  - Being able to check output

Development of skills – case 4

- Which skills does Gen AI replace? Searching, evaluating, analysing, writing, reasoning, coding, creative thinking, etc.
- How do I feel about this, do I want this?

Questions – choosing an Gen AI tool

- Wooclap: RFHBMO
- Question: 13

How to pick a tool to use?

- Privacy/data data security --> **UvA AI chat**, Microsoft copilot (UvA), ChatGPT Teams. Potentially Google NotebookLM. NOT free ChatGPT.
- Environmental impact --> Determine if impact worth it. Pick model with lower footprint.
- Bias --> evaluate bias + pick model with less bias (GPT)
- Correctness of output --> powerful model / model that uses own sources (for example NotebookLM / custom persona)

Closing

- Many opportunities, keep in mind:
  - Use Gen AI responsibly
  - Use Gen AI only for graded assignments if indicated explicitly. Like for this week / assignment.


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Questions?