Recap of yesterday

1: Foundation
2: Communication with GenAI
3: Toolkit
4: 5A-APIs, Applications, Assistants, Automation, and Agents
5: Generative AI use cases

LSB Luxembourg School of Business

GenAI for Business 2026

Session 6: GenAI for different functional activities

Shubin Yu

GenAI in Marketing

Generative AI: Powering Data-Driven Marketing

Marketing Communications

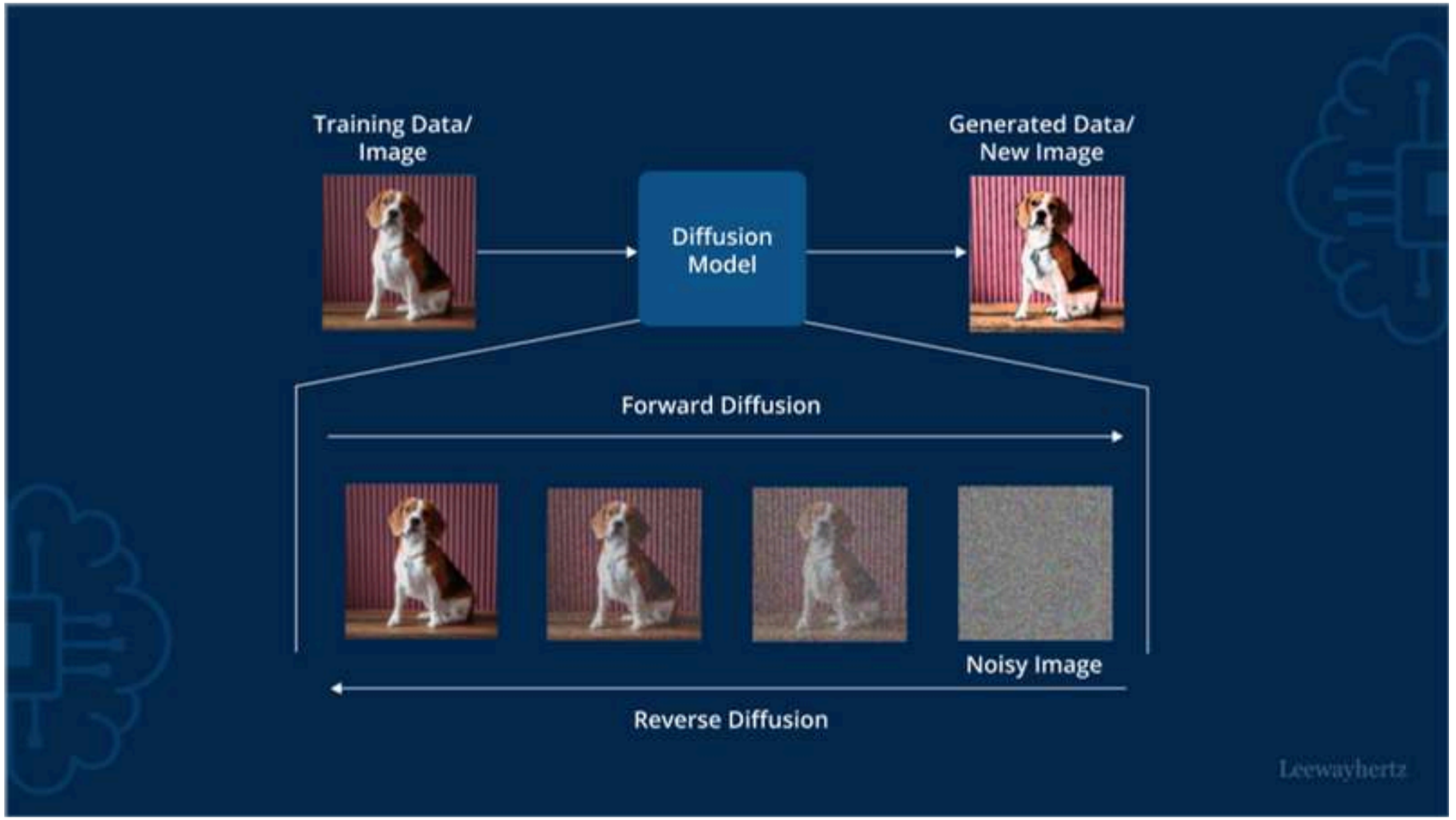
GenAI generates engaging content, personalized campaigns, and segmented audiences.

Customer Service

GenAI chatbots provide instant responses, personalize interactions, and improve customer satisfaction.

Product Development and research

GenAI optimizes designs, prototypes features, and creates innovative products based on customer insights.



https://www.assemblyai.com/blog/diffusion-models-for-machine-learning-introduction/

Generative AI: Powering Creative Advertising

Efficient Content Creation

AI can automate many aspects of content creation, saving time and resources for marketers. It can generate high-quality ideas, ad copy, design visuals, and even produce audios and videos.

Fine-tune models

Advertisers can fine-tune open-source GenAI models (e.g., stable diffusion) using their own training materials.

Performance

Preliminary research findings show that AI-generated ads have much better performance than freelancers generated ads*.

Polestar

Polestar

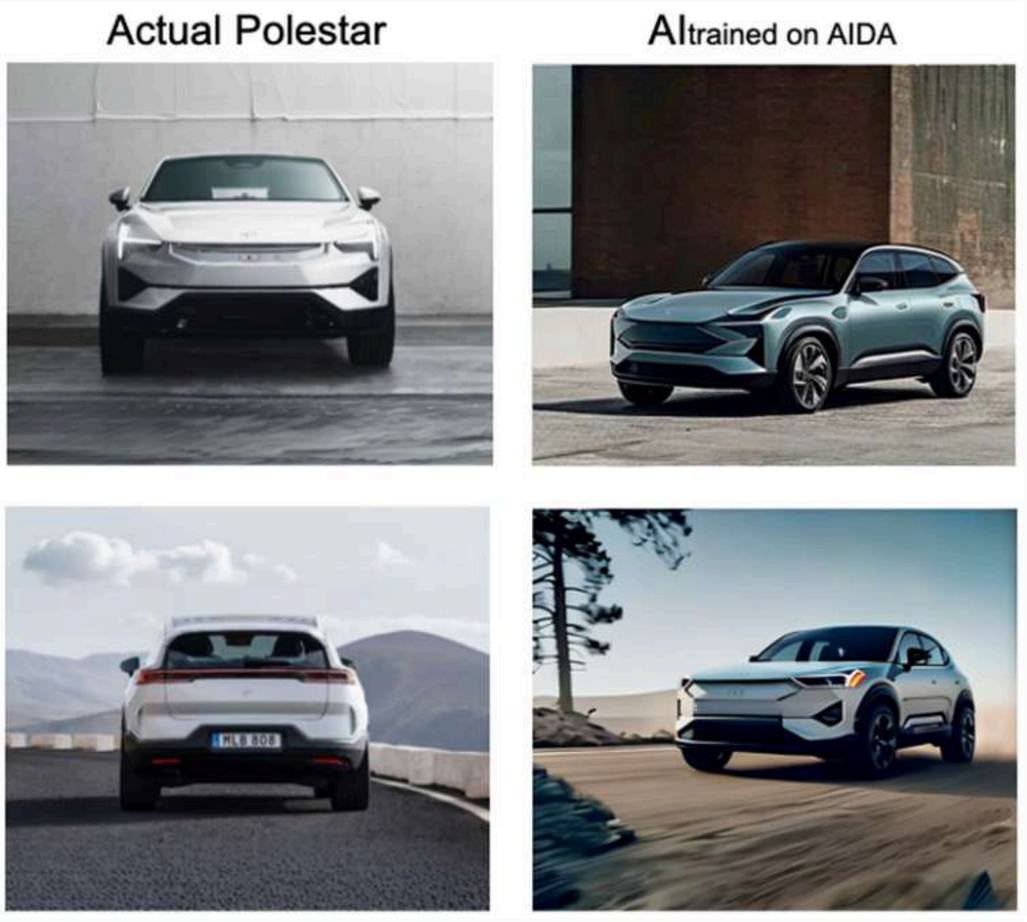
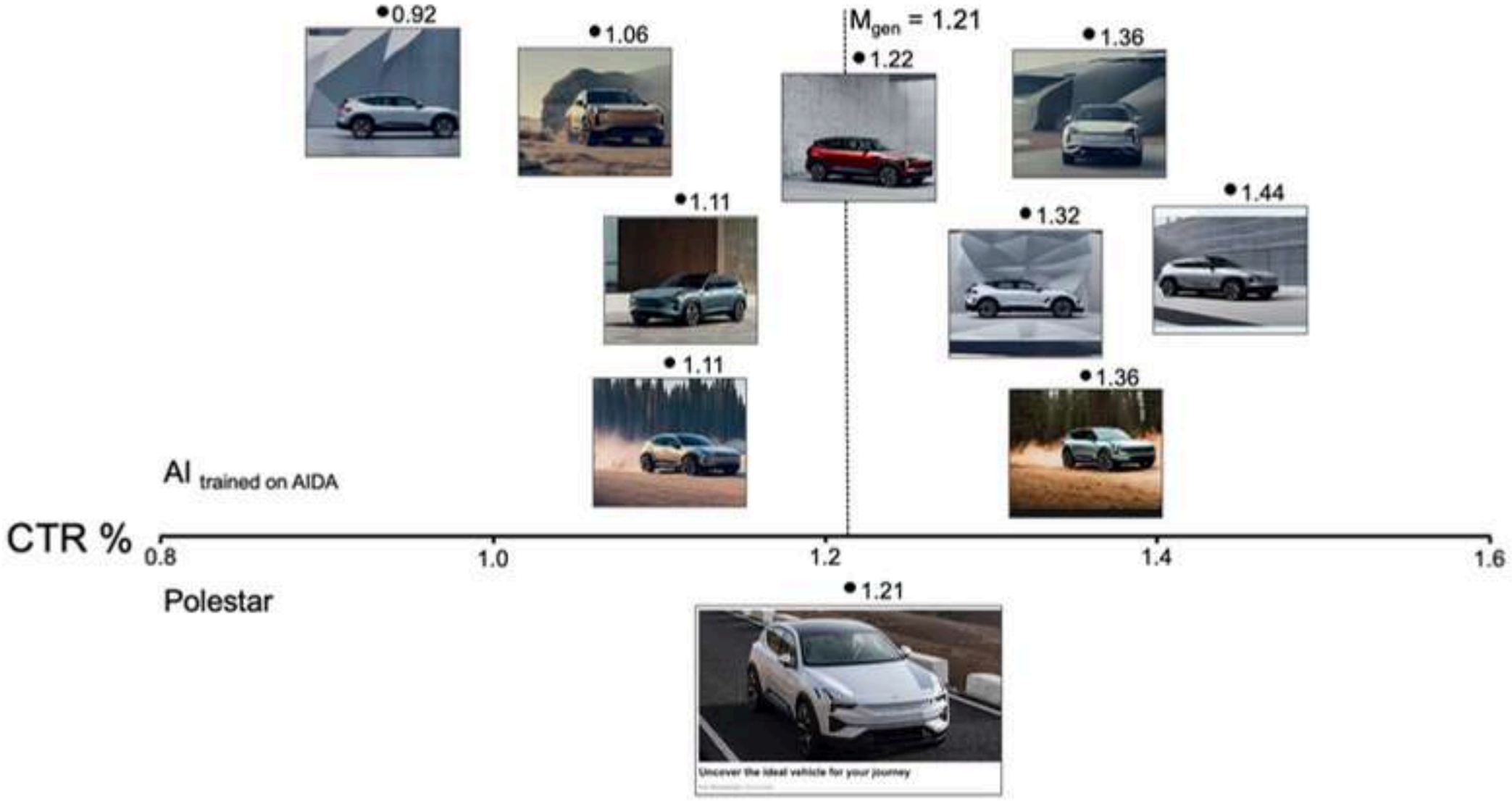
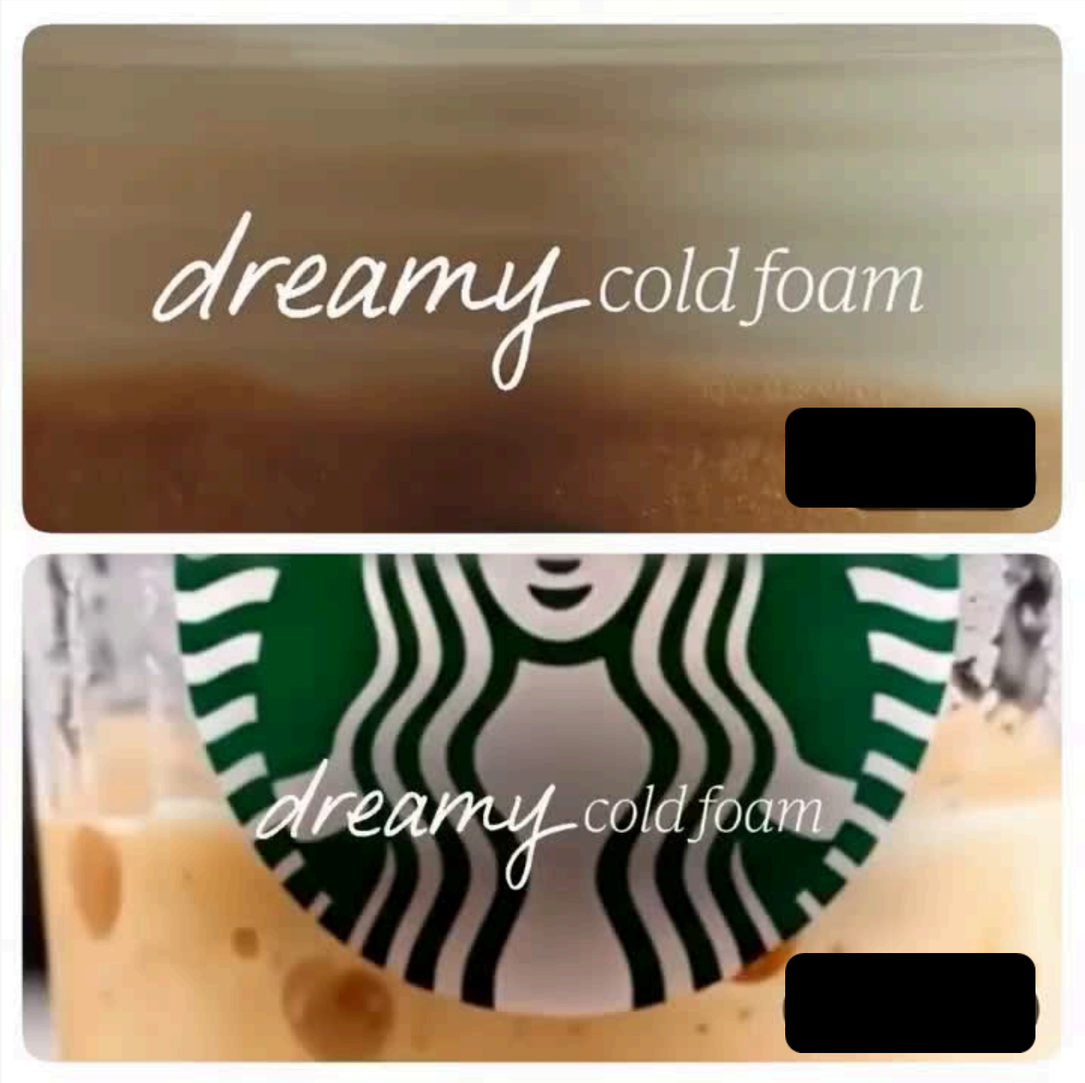


Figure 8: Click-through rates of actual and AI-generated ads



VIDEO GENERATION



VEO, Sora, Wan, Runway, Seedance, Kling, Hailuo

Core prompt structure for video generation

- Subject: Main character/object with detailed appearance and emotions
- Action: Specific movements and behaviors (vivid verbs)
- Scene/Environment: Physical setting, atmosphere, lighting conditions
- Camera Motion: Movement type (pan, dolly, tracking, static)
- Composition: Shot type (close-up, wide, overhead, medium)
- Style/Aesthetic: Cinematic references, color grading, mood
- Temporal Elements: Timing, transitions, sequence flow

Key techniques

- Cinematic Realism Focus - Include camera specs (ARRI ALEXA, RED EPIC), lens choices (24mm wide, 85mm portrait)
- Dynamic Camera Movement - Specify tracking shots, slow pans, dolly movements
- Atmospheric Details - Add environmental effects (fog, rain, sunbeams, steam)
- Professional References - Citation cinematographers/directors for style guidance
- Temporal Specifications - Include slow-motion, transitions, sequence timing
- Color Grading - Specify mood-appropriate palettes (warm/vibrant vs cool/muted)

Formula template

- Subject + Action + Scene + Camera Movement + Lighting + Style
- Example: "Professional chef with white hat, chopping vegetables with focused concentration, in a sunlit stainless-steel kitchen, slow pan left to right, warm cinematic lighting, shallow depth of field"

Exercise: turn your image to a video

- Convert your Mimi print advertisement into a TV commercial!
- Use Veo, Runway, Hailuo, or Kling to convert the image to video.

- Share it with us! https://padlet.com/binbs/GenAI4Biz

Generative advertising

Generative advertising is a form of dynamic advertising where AI models create personalized, multimedia advertisements in real-time by responding to user preferences and characteristics. Using multimodal generative AI models, advertisers input prompts that result in customized ad content, incorporating elements such as visuals, music, and text that align with individual users' demonstrated preferences and behavioral patterns.

David

28 years old
Like watching dog videos on TikTok.
Following many TikTok account about rock music
Searching for laptop recommendation videos recently on TikTok

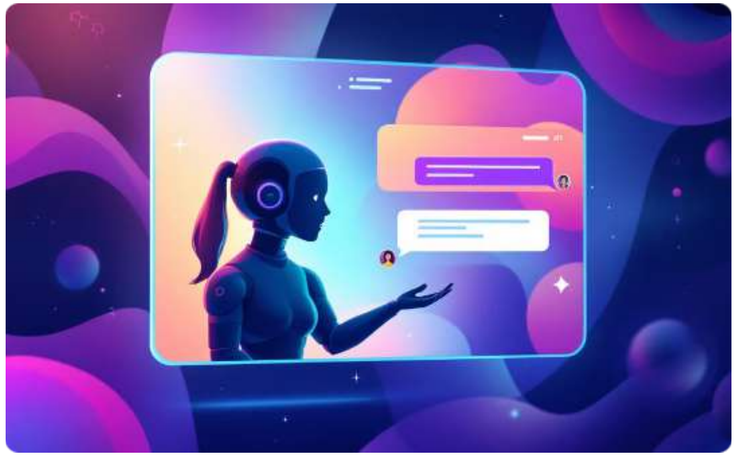
The next day....

What are your thoughts on Generative advertising?

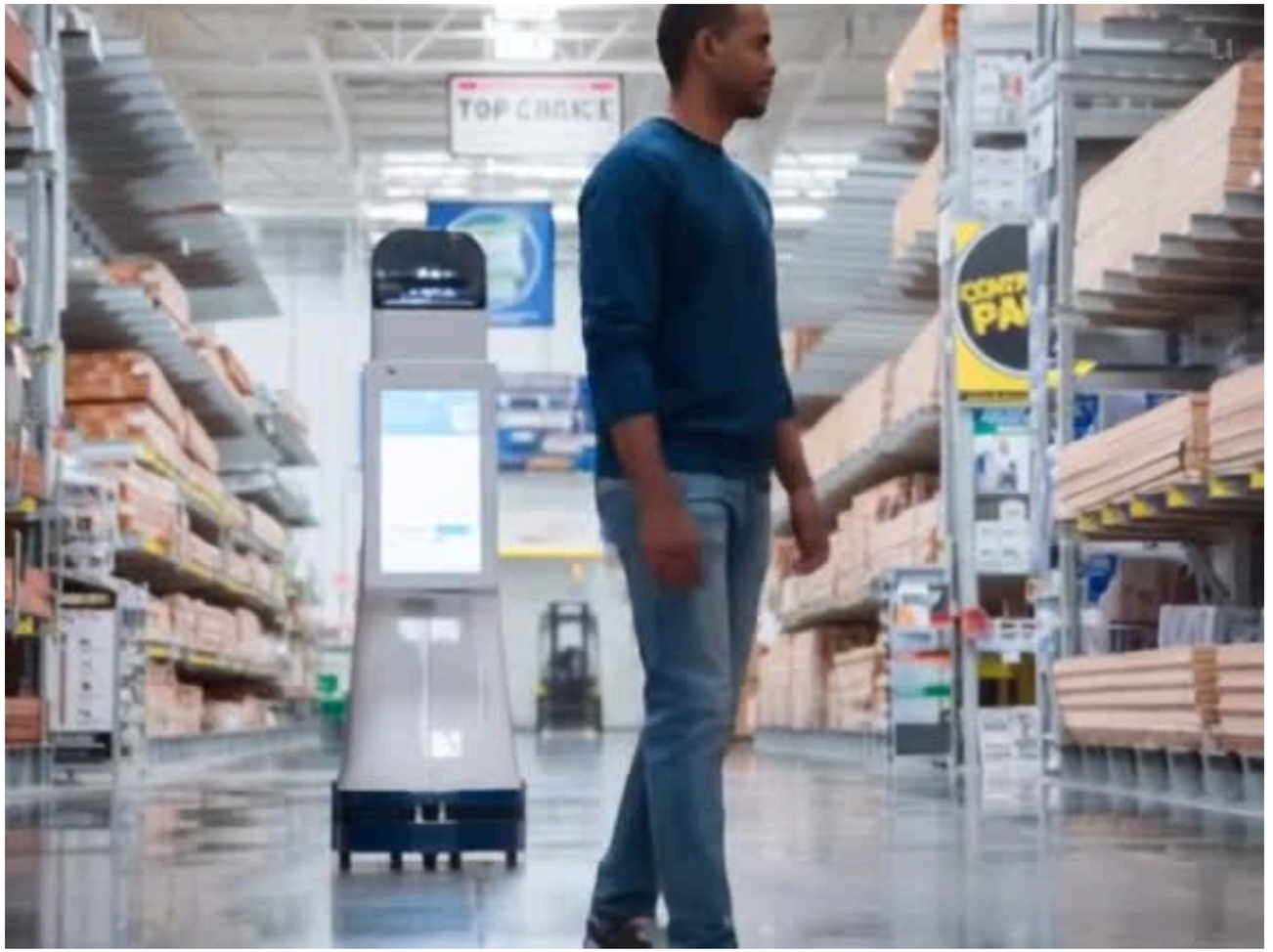
Enhancing Consumer Decisions with AI Agents

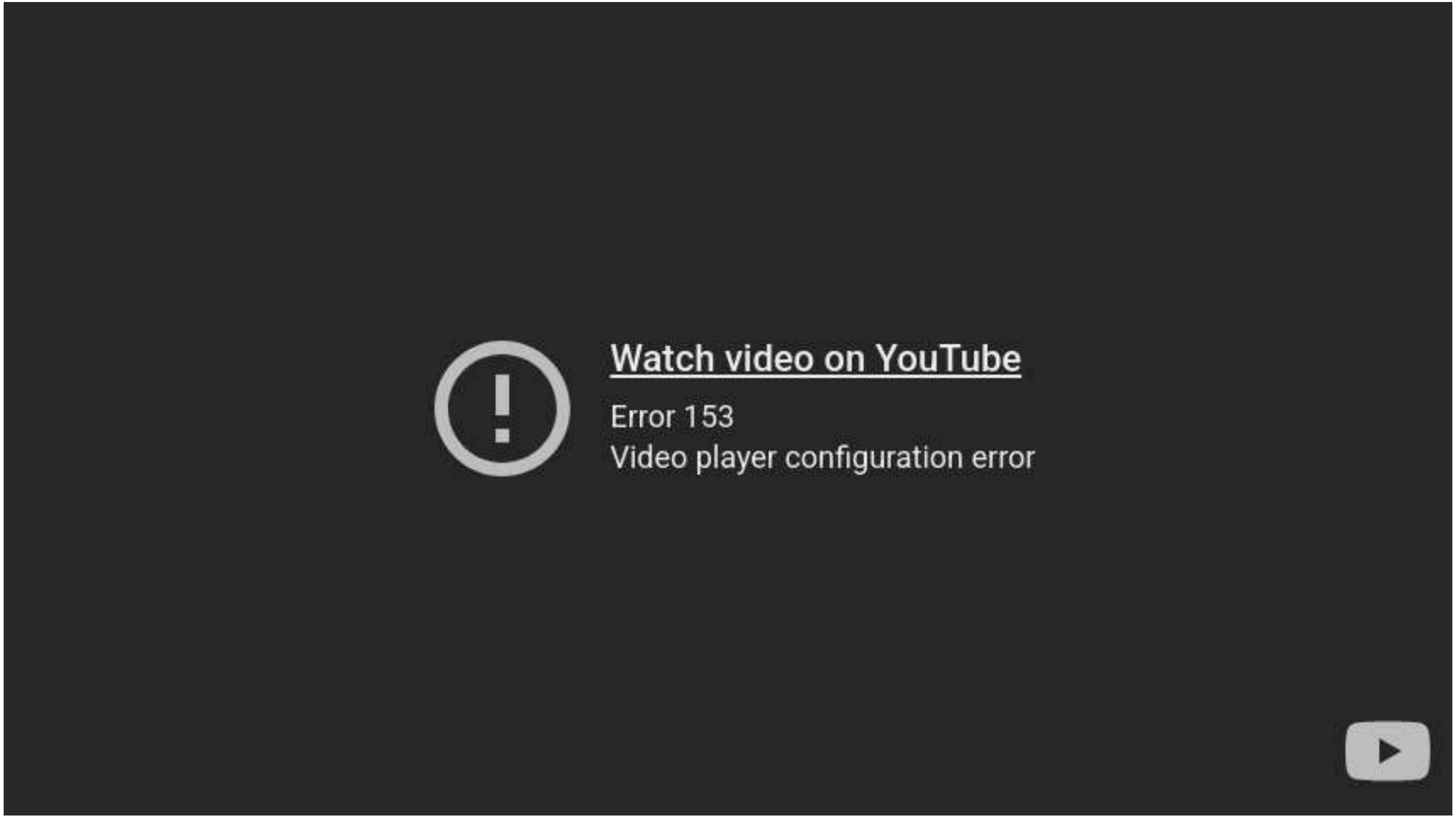
Customer Service Automation

Search and shop with AI agents



Chatbot advertising


TOP CHOICE

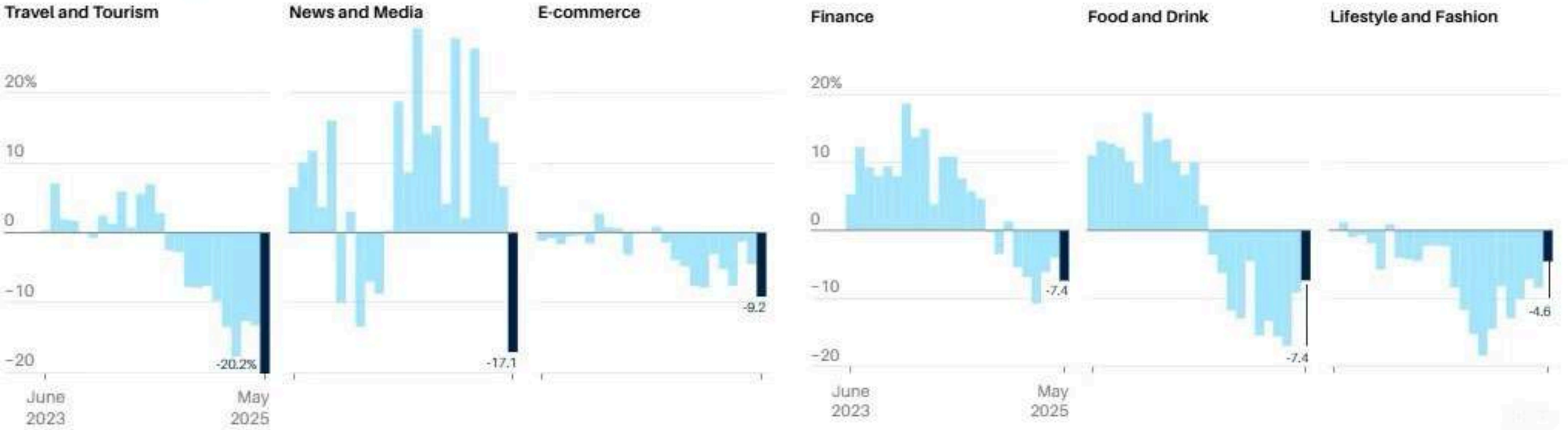

Watch video on YouTube
Error 153
Video player configuration error

Search engine optimization (SEO)?

Search's Rapid Decline

Growth rates for U.S. search traffic have been slowing across various sectors for the past year. But the decline accelerated in May, across key sectors of the internet economy.

Year-over-year change



Source: Similarweb

Generative Engine Optimization

Where AI Gets Its Info: Top Sources 2025

Top 10 web domains cited by large language models (LLMs) in June 2025* (in %)

* Google's AI Mode, AI overviews, ChatGPT and Perplexity
Based on 150 thousand citations from 5,000 randomly selected keywords from Semrush database.

Source: Semrush

statista

Understanding Consumers with LLMs-driven Text Analytics

1

Role of Text Analytics

LLMs analyzes consumer feedback, social media comments, and reviews, revealing valuable insights for marketing without pre-training.

2

Insight Extraction

LLMs parse large volumes of short text to extract consumer concerns, opinions, trends, and preferences (short-text topic modelling).

3

Annotation

LLMs can annotate texts and give labels to each entry based on the definition and examples (few-shot).

4

Multilingual capability

LLMs exceed by understand languages from different national markets.

Gilardi, F., Alizadeh, M., & Kubli, M. (2023). ChatGPT outperforms crowd workers for text-annotation tasks. PNAS, 120(27).
Rathje, S., et al. (2024). GPT is an effective tool for multilingual psychological text analysis. PNAS, 121(1).
Yu.S. (2024). Using Large Language Models in Short Text Topic Modeling, OSF preprint.

Immersive Products with GenAI integration

Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) are revolutionizing the way brands interact with consumers.

AR

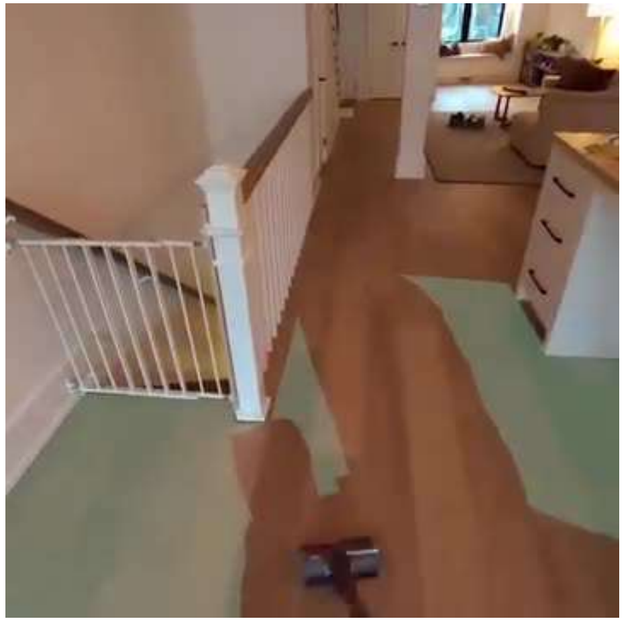
Overlays digital elements onto the real world, enhancing user experiences.

VR

Creates fully immersive virtual environments, transporting users to different worlds.

MR

Blends real and virtual worlds, enabling users to interact with both simultaneously.

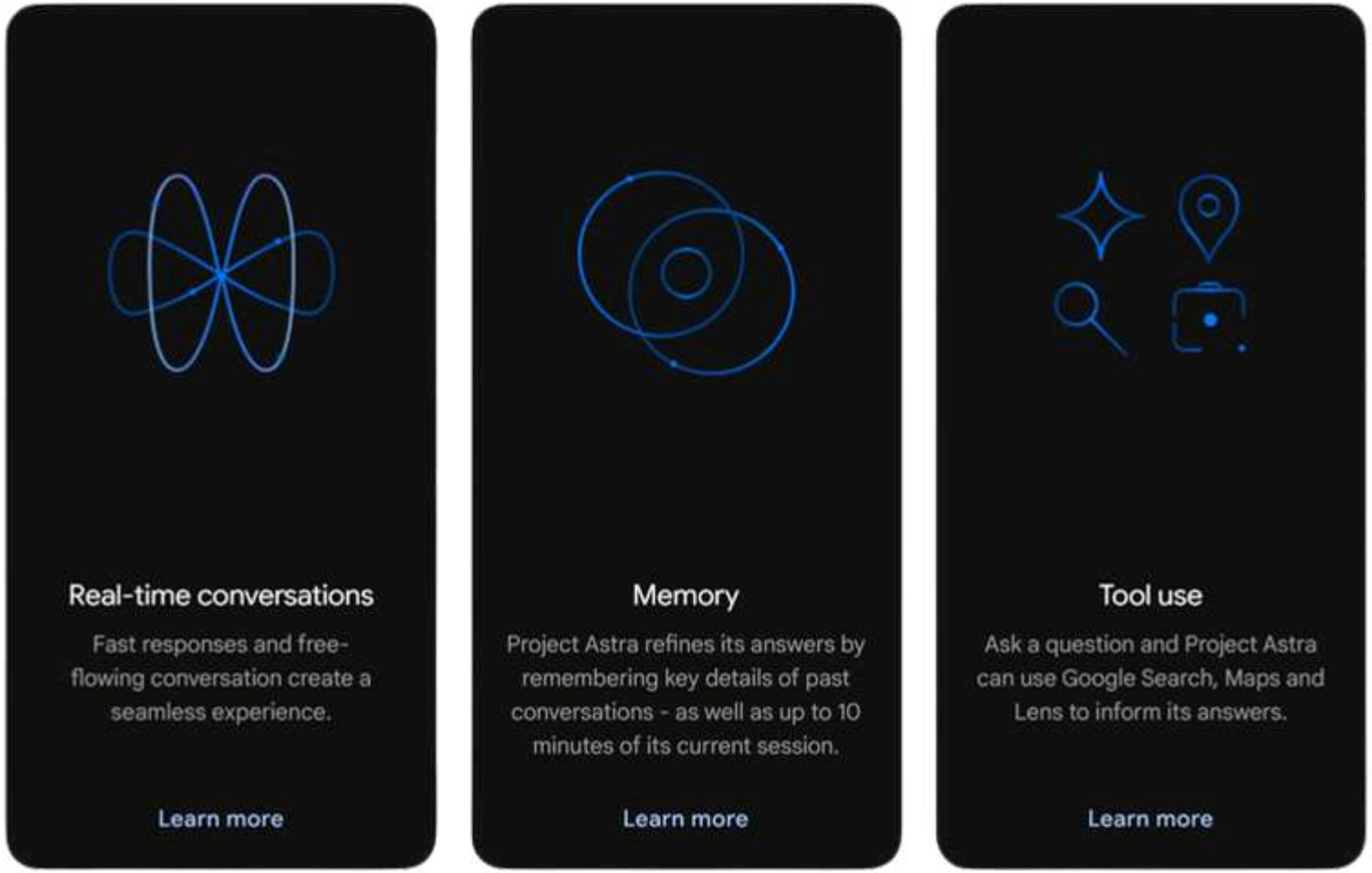


https://huggingface.co/spaces/webml-community/smolvlm-realtime-webgpu


Mon, 30 Jan
19:05
100%
How are you?
你好吗？
EN ⇆ CH

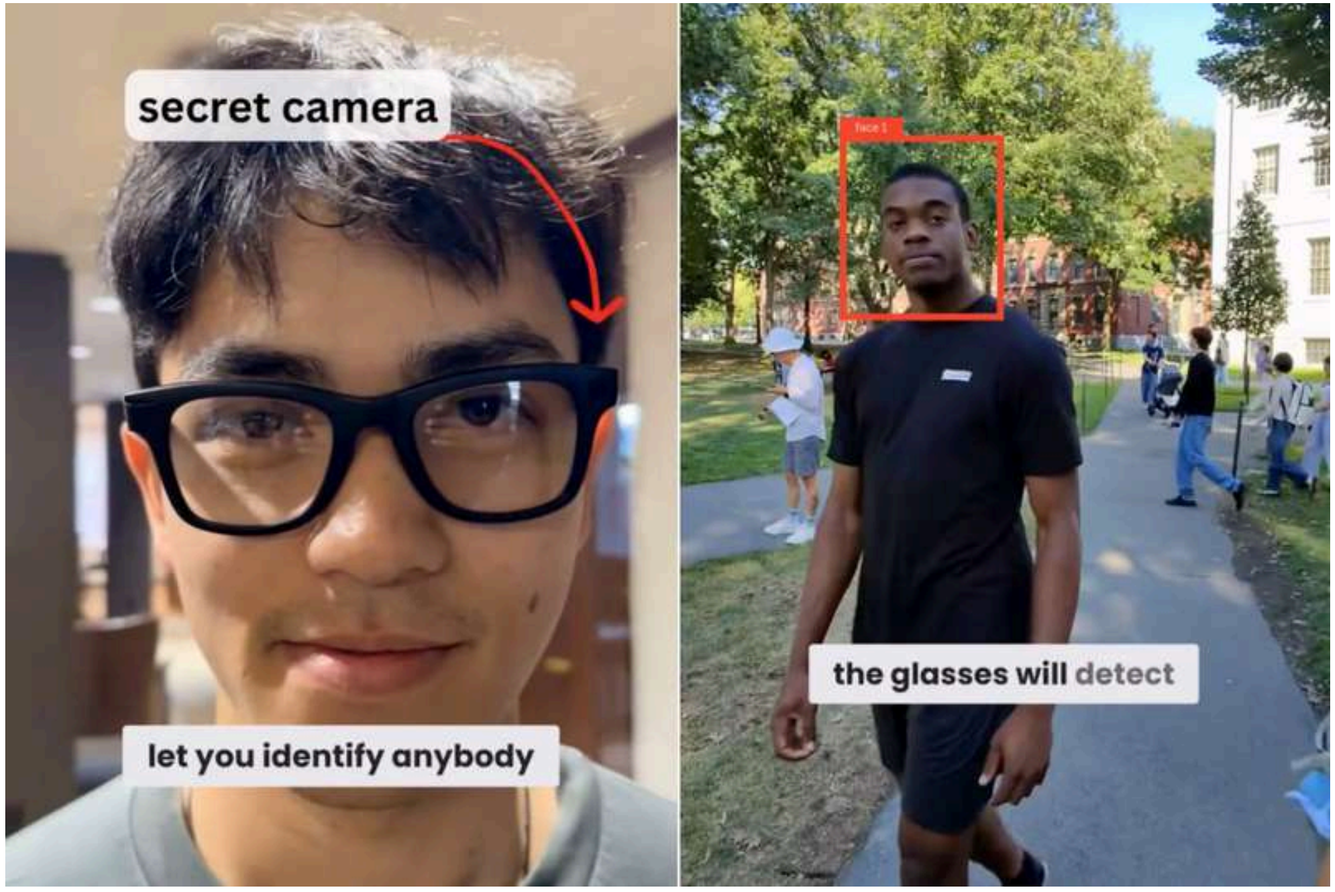
https://www.youtube.com/watch?v=gZ9IsB72nVk

Project Astra



Project Astra is a research prototype by Google DeepMind to integrate phones, glasses, AR, and GenAI.

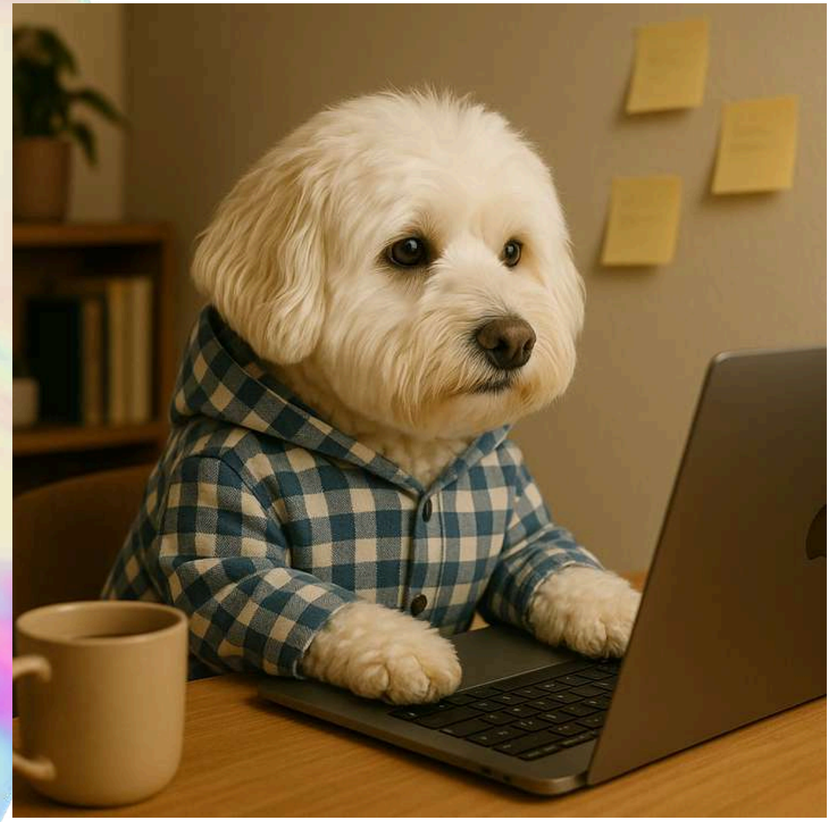
Will smart glasses replace smart phones?


secret camera
let you identify anybody
the glasses will detect

Opportunities and challenges

- High personalization of ads – Privacy
- Content creation – Intellectual property
- High autonomy of chatbots – Security
- Multilingual understanding – Machine heuristics and cross-cultural bias

Coding and app development



Traditional coding

Only for skilled programmers

Programming using python, java, c++

Frontend, backend, prototyping, debugging, deployment...

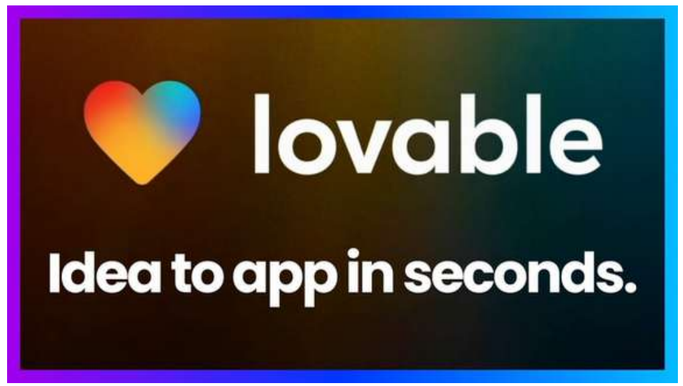
Vibe coding

What is vibe coding?

Programming using natural languages

A programming paradigm dependent on GenAI, where a person describes a problem in a few sentences as a prompt to a large language model (LLM) tuned for coding.

Tool: Lovable and replit



Problem

Idea

Vibe coding

Solution

LSB Luxembourg School of Business

https://catlendar.gaiforresearch.com

Day Trip to Luxembourg – Friday, 23 January 2026

Time Place Activity
08:30 – 09:30 Train/Car Arrive in Luxembourg City
09:30 – 10:00 Café Français, Place d'Armes Breakfast – coffee and pastry
10:00 – 10:30 Grand Ducal Palace Exterior viewing and photos of the palace and Rue du Marché-aux-Herbes
10:30 – 11:30 Bock Casemates Guided or self-guided tour of the underground fortifications
11:30 – 12:15 Chemin de la Corniche Walk along the cliff-edge promenade with views over the Grund
12:15 – 12:30 Descent via Elevator or Stairs Head down to the Grund district
12:30 – 13:45 Mousel's Cantine, Grund Lunch – traditional Luxembourgish cuisine
13:45 – 14:15 Grund District Stroll along the Alzette River and explore the old quarter
14:15 – 14:30 Walk or Bus Head to Kirchberg plateau
14:30 – 16:30 MUDAM (Museum of Modern Art) Explore contemporary art exhibitions
16:30 – 17:00 Philharmonie Luxembourg (exterior) Admire the architecture and surroundings
17:00 – 17:30 Tram or Bus Return to the Old Town
17:30 – 18:30 Vinoteca, Rue du St Esprit Wine tasting – Luxembourgish Crémant and Moselle wines
18:30 – 20:00 Restaurant Clairefontaine or Mosconi Dinner – fine dining option
20:00 – 20:30 Walk through illuminated Old Town Evening stroll past Notre-Dame Cathedral and Place Guillaume II
20:30 onwards Luxembourg Gare or Parking Depart for home

Convert messy agenda to calendar invites

Catlendar

Vibe coding assignment

- Think about a challenge at work or in your life
- Vibe code an app to tackle this problem
- You have 50 minutes to work on the app
- It needs to be fully functionable with user friendly interface

- Present your app (5 minutes each person)

Data analysis

AI-assisted data analysis

AI-assisted data analysis is the practice of chatting with code-generating models using natural language, to help automate, accelerate, and enhance the process of exploring, processing, modeling, and interpreting data.

Why AI-Assisted ⟩⟨ Full AI Analysis

AI-Assisted

e.g., Use AI to generate codes to perform analysis in an IDE

- ✅ Data stays in YOUR environment
- ✅ You see every step of the process
- ✅ Full control over methods used
- ✅ Reproducible analysis

Full AI Analysis

e.g., Upload your dataset to ChatGPT and ask it to perform the analysis

- ❌ Data leaves your control
- ❌ "Black box" analysis
- ❌ No audit trail
- ❌ Potential data breaches

When to use GenAI in data science

Writing code
Debugging code
Explaining code
Converting code

But remember, the AI is a tool, not a substitute for your judgment.
You're still the one deciding which analyses to run, how to frame your questions, and whether its suggestions actually make sense for your problem.

Prompt Engineering for Data Analysis with GenAI

Key Principles:

- Be specific and concrete
- State desired output format clearly
- Provide relevant context
- Break complex tasks into steps

Best Practices

Multi-Step Prompting: Include context & be specific:

1. You can instruct the LLM to “act as a data analyst” and request R/Python code
2. Clearly describe your data and task in the prompt in detail (e.g., dataset name, variable names, which analysis) – generic questions get generic answers
3. Ask for clarification of the code and learn together with GenAI; Build on previous responses and ask for follow-up adjustments (e.g., change the label size)

Pro Tip: Save effective prompts as templates for similar future analyses

Five steps to Generate R Code

1. State the role and the goal: Prompt the model to act like a data analyst and outline the marketing analytics task (e.g., "cluster customers by purchase behavior" or "calculate Customer Lifetime Value") with relevant details.
2. Provide detailed information about the data: Describe the dataset: "My data frame is called df and has columns: sales (numeric), advertising_spend (numeric), and region (factor)."
3. Specify the method & ask for code: Mention the analysis technique or model (like k-means clustering or a CLV formula) and explicitly request an R script solving the task.
4. Set format and clarity: For example, prompt the model to output well-commented R code or an RMarkdown-style answer.
5. Other requests: Preferred library, with or without detailed explanation for every line of code...

Example

- Please act as a data scientist with complete knowledge of the R language. Produce R code testing the effect of education level on consumer spending on books.
- Import the dataset called dd.csv. There are four columns: edu (factor, education), age (numeric), gender (factor), and book (numeric, annual spending on books).
- Please perform a regression analysis with DV as book and IV as education. Visualize the effect.
- Your response output should be in R and RMarkdown format with text and code delineated with ``` blocks.
- At the beginning of the new file, make sure to install RStudio system dependencies and R libraries.

Example

State the role and the goal

- Please act as a data scientist with complete knowledge of the R language. Produce R code testing the effect of education level on consumer spending on books.

Provide detailed information about the data

- Import the dataset called dd.csv. There are four columns: edu (factor, education), age (numeric), gender (factor), and book (numeric, annual spending on books).

Specify the method & ask for code

- Please perform a regression analysis with DV as book and IV as education. Visualize the effect.

- Your response output should be in R and RMarkdown format with text and code delineated with ``` blocks.

Set format and clarity

- At the beginning of the new file, make sure to install RStudio system dependencies and R libraries.

Other requests

Debug

- It is normal for the code not to work the first time.
- We can use LLMs to debug, like catching missing libraries, forgotten imports, or incorrect variable types.
- Paste your problematic code along with the error message or output, and ask the AI to pinpoint the issue and suggest a fix.
- Debugging is also a way to learn from your mistakes.

Tool: Colab

Google Colab vs. Jupiter Notebook/RStudio

Google Colab runs entirely in your browser with zero setup required. It's like Google Docs for code - you can share notebooks, collaborate in real-time, and access free computing resources.

Jupiter Notebook and RStudio are traditional IDEs (integrated development environment) optimized for python and r workflows.

Google Colab	RStudio
☁️ Cloud-based (AI built in)	💻 Desktop-based
🌐 Browser interface	🖥️ IDE interface
🐍 Multi-language (R or python)	📊 R-focused
🤝 Real-time collaboration	📁 Local projects
🆓 Free GPU/TPU	🔧 Full R ecosystem

AI Assistance Options

Built-in vs External AI Tools

Colab's Codey

Google’s Gemini

Integrated in Colab toolbar

Context-aware

Colab-specific features

External AI

More advanced models (e.g., ChatGPT, Claude)

Broader knowledge

More accurate

Getting Started with Colab

📂 Import Data — Direct upload | Google Drive mount | URL fetch

🔄 Switch to R Runtime — Runtime → Change runtime type → R

📦 Install Packages — Python: !pip install | R: install.packages()

For data import, I recommend using Direct upload for small files and Google Drive for larger files - it's persistent across sessions.

Package installation is temporary per session, so include installation commands at the top of your notebooks.

Exercise: Advertising Budget Optimization

"We're advertising across TV, radio, and newspapers, but which channels actually drive sales? Can we do better with less?"

Your team collected 200 weeks of data: advertising spend by channel and resulting sales.
Your Mission: optimize your marketing budget using data-driven insights.

Television

Newspaper

Radio

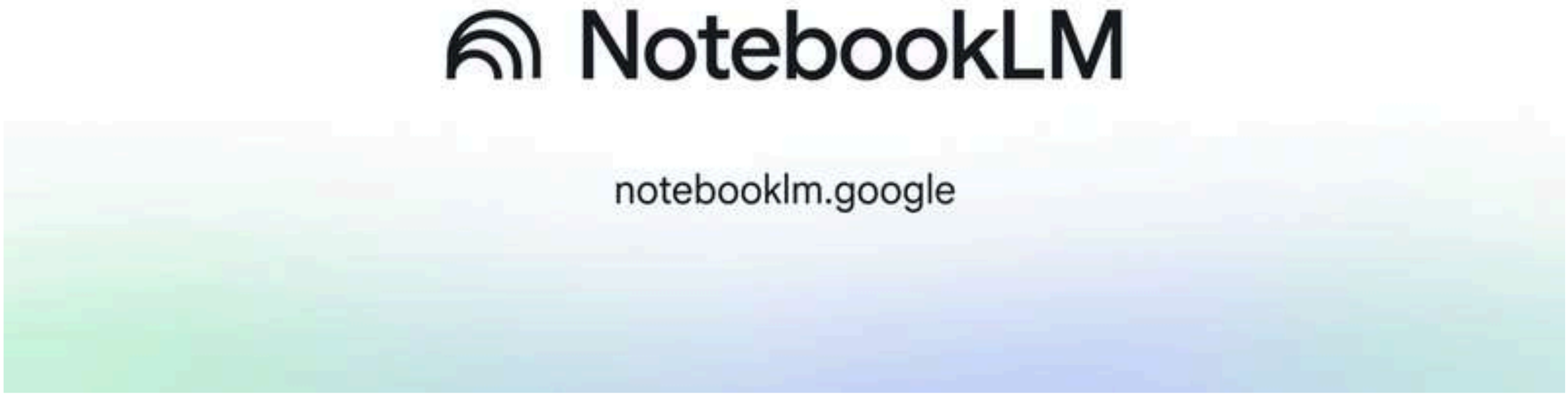
What do you think about vibe coding and conversational data analysis?

GenAI in Knowledge management

Knowledge base

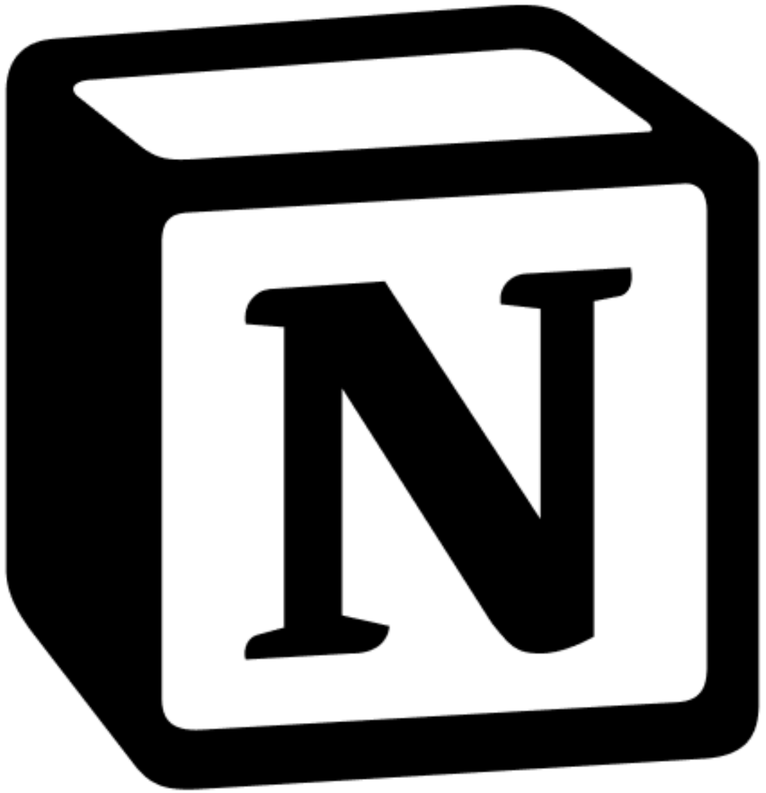
- A knowledge base (KB) is a structured collection of information and data, serving as a centralized repository for both internal and external use within an organization/ a person.
- It can be used to store everything from company policies and training materials to customer support documentation and product information.

Tool: NotebookLM



Tool: AnythingLLM

Tool: Notion



- Record meeting
- Summarize meeting
- Provide action items

GenAI in Human Resource Management

Generative AI: Automating Human Resource Management

AI-Powered Recruitment

- Resume screening automation
- Candidate matching
- AI Interviewer

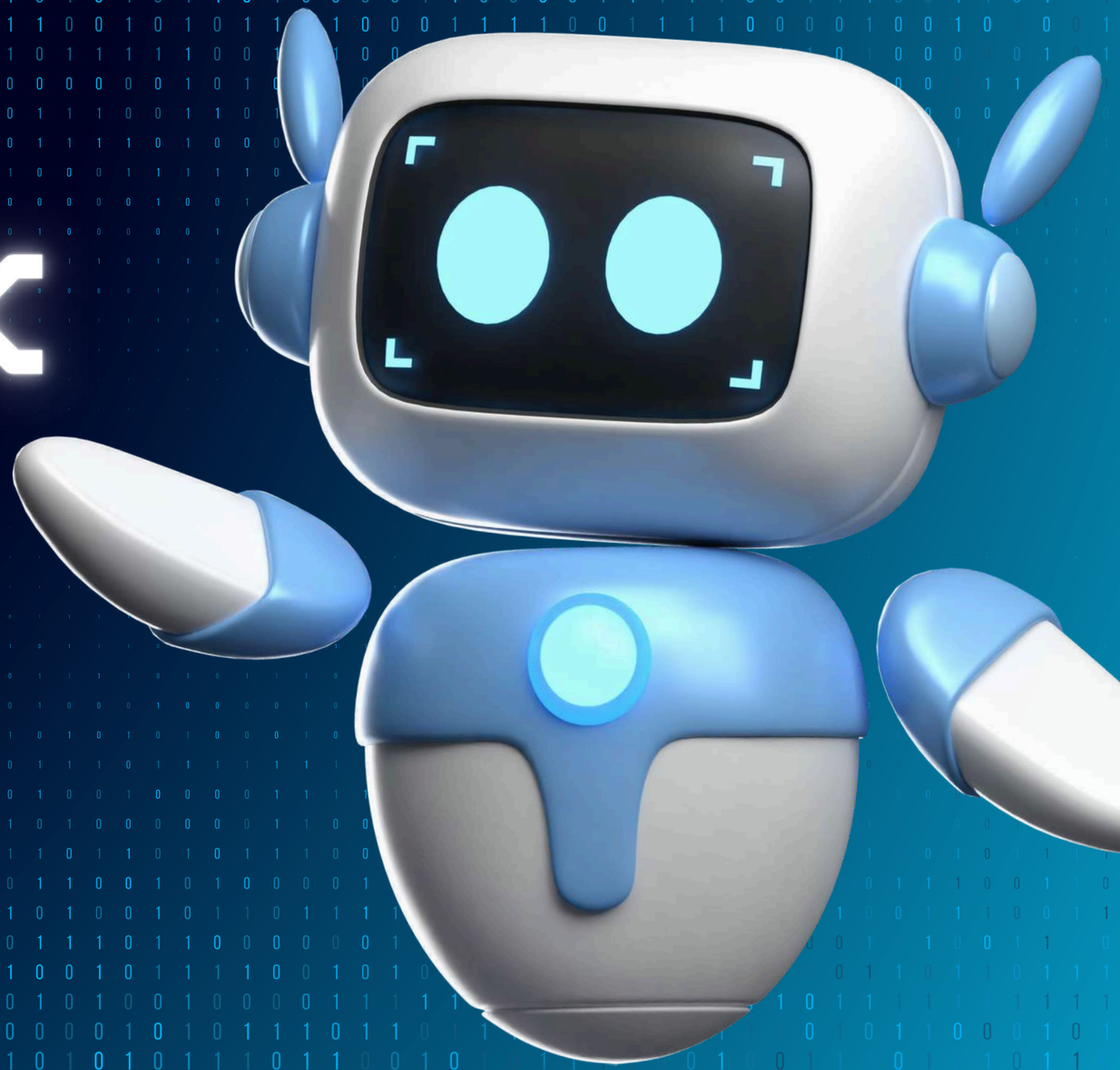
Job Description Generation

- Database
- Skills analysis
- Market-aligned descriptions

Personalized Onboarding

- Automated welcome sequences
- Custom learning paths
- Digital documentation

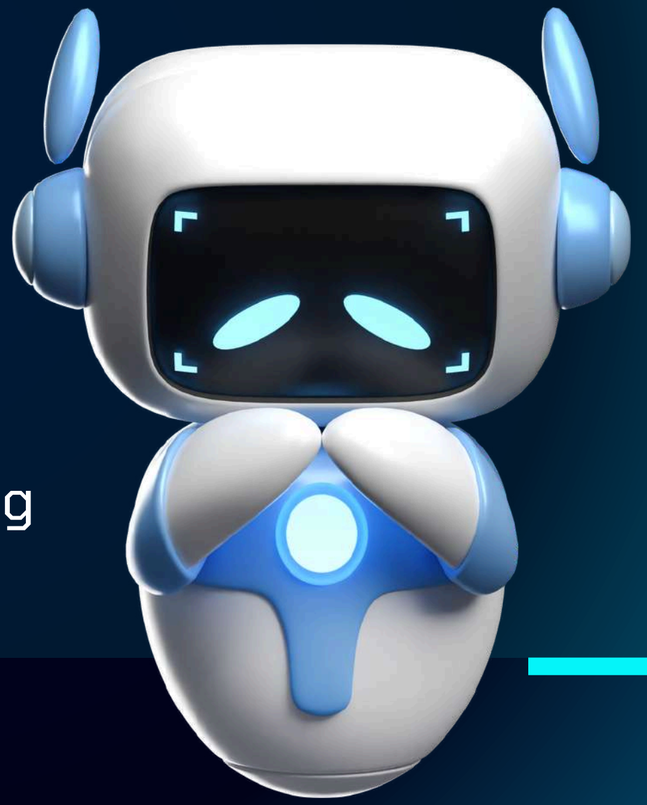
MIMITALK 3.0



QualiTaTi

1 CHALLENGES OF TRADITIONAL INTERVIEW METHODS?

- Resource intensity
- Geographic limitations
- Language barriers
- Interviewer bias
- Scheduling difficulty
- Scalability challenges
- Time-consuming data processing



QualiTaTi

1 WHY AI INTERVIEWERS?

- Reduced resource requirements
- Geographic flexibility
- Consistency across interviews
- Scalability
- Reduced participant stress
- Real-time analysis
- Accessibility benefits
- Time efficiency
- Multi-language capability

QualiTaTi

2 RESEARCH IN AI INTERVIEWERS

WUTTKE, A., ABENMACHER, M., KLAMM, C., LANG, M. M., WÜRSCHINGER, Q., & KREUTER, F. (2024). AI CONVERSATIONAL INTERVIEWING: TRANSFORMING SURVEYS WITH LLMS AS ADAPTIVE INTERVIEWERS. ARXIV PREPRINT ARXIV:2410.01824.

- **AI interviews produced data quality comparable to human-led interviews**
- Humans struggled with active listening; AI had issues with appropriate follow-ups
- Participants gave notably longer responses to AI interviewers compared to humans
- Similar overall response quality between AI and human interviews across multiple quality metrics
- Most users preferred written input over audio due to technical issues with recording/transcription
- Input mode significantly affected responses: audio responses were longer but possibly less thoughtfully constructed
- Participants found both AI and human interviewers clear and understanding
- **Lower interest in repeating AI interviews, potentially due to technical challenges**

CHOPRA, F., & HAALAND, I. (2023). CONDUCTING QUALITATIVE INTERVIEWS WITH AI.

- Participants showed strong engagement, completing interviews voluntarily with detailed answers and minimal fatigue
- **Majority of respondents expressed preference for AI interviews over human interviews**
- **Generated rich, novel insights** into stock market non-participation, revealing multifaceted reasoning
- Identified high co-occurrence between different reasons for non-participation, showing complex decision patterns
- Traditional small sample interviews (n≈20) failed to capture the full richness and co-occurrence patterns found in large-scale AI interviews
- AI interviews produced more detailed and nuanced responses compared to traditional open-ended survey questions

QualiTaTi

2 RESEARCH IN AI INTERVIEWERS

JOERLING, M. & YU, S (WORKING PAPER). REPLICATE INTERVIEW STUDIES PUBLISHED AT TOP MARKETING JOURNALS.

- **AI interviews perform better than traditional human interviewers in unveiling different dimensions of concept.**
- **The results hold consistent across different modality (text to text, text to voice, voice to text, voice to voice)**

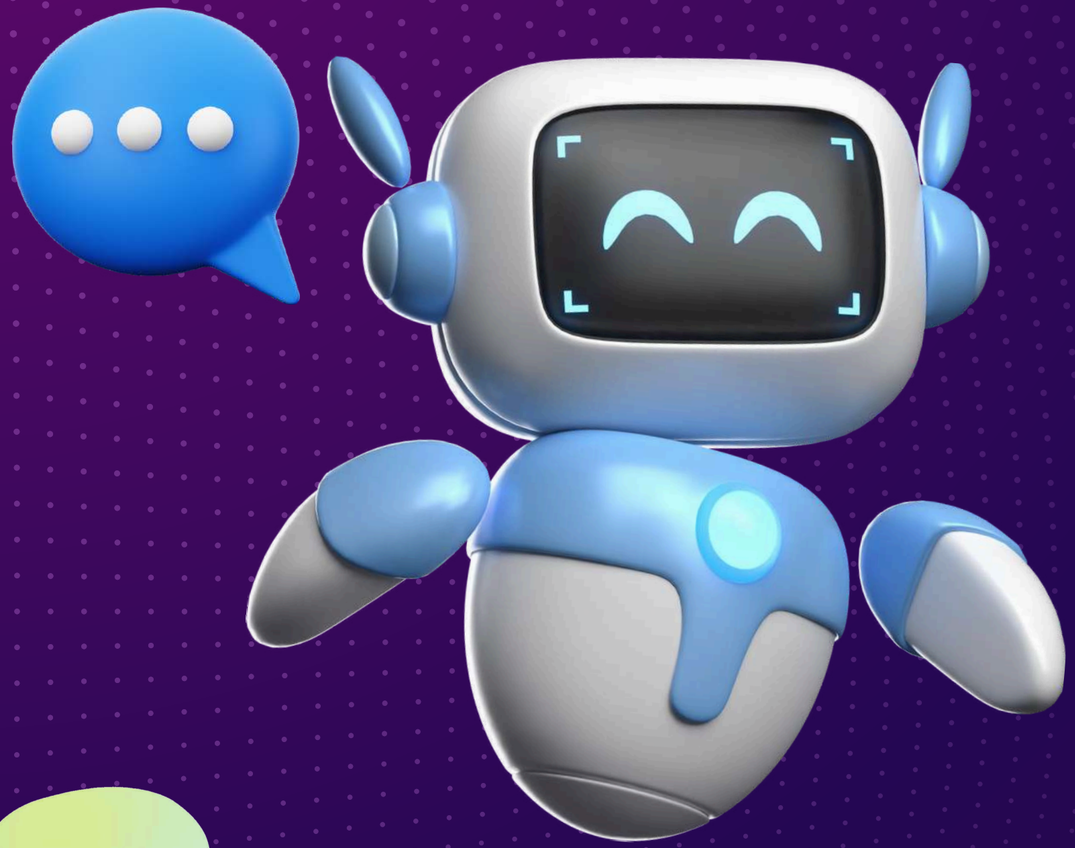
QualiTaTi

MIMITALK.APP

https://mimitalk.app
Customize your AI interviewer

MimiTalk!

MIMITALK.APP

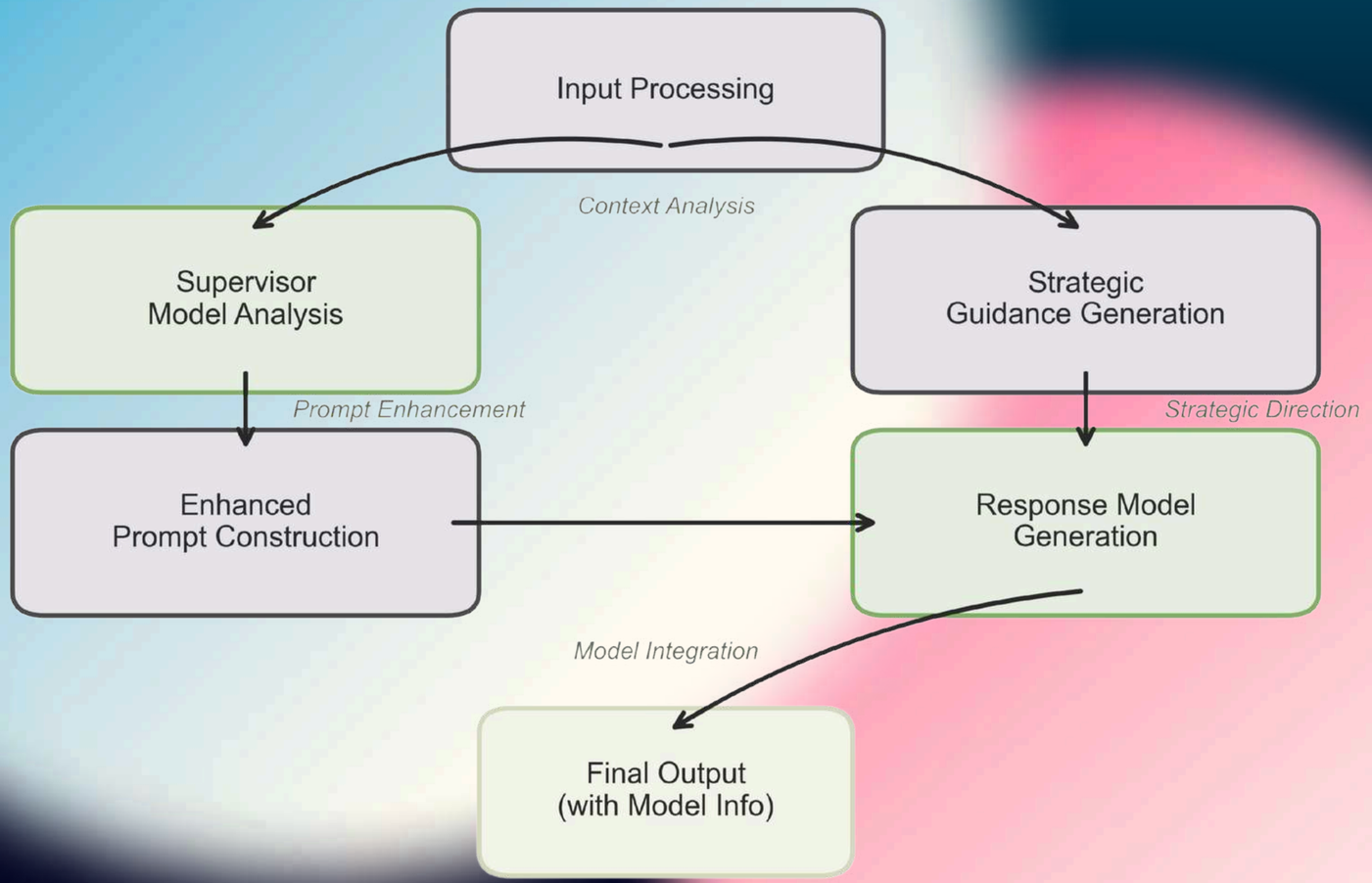


- MULTI MODALITY
- DUAL-MODEL INTERVIEW
- REAL TIME ANALYSIS

QualiTaTi

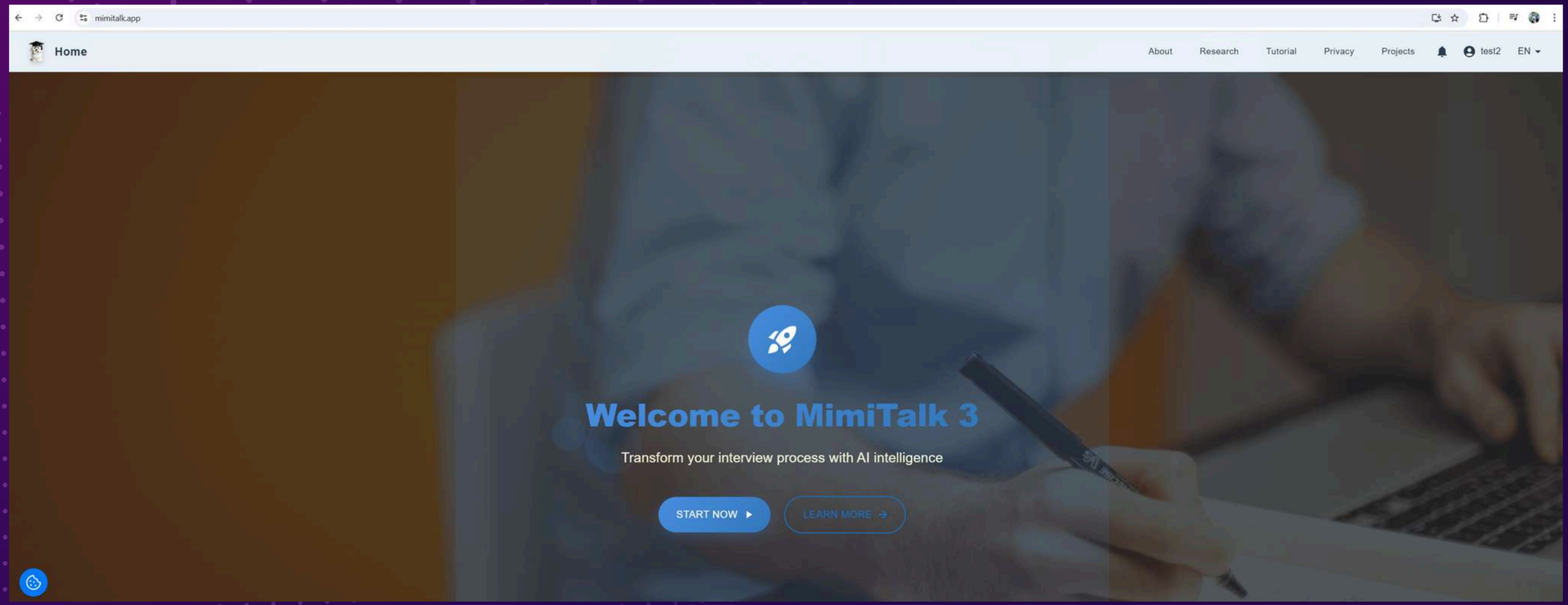
AI Interview Question Generation

Dual-Model Architecture

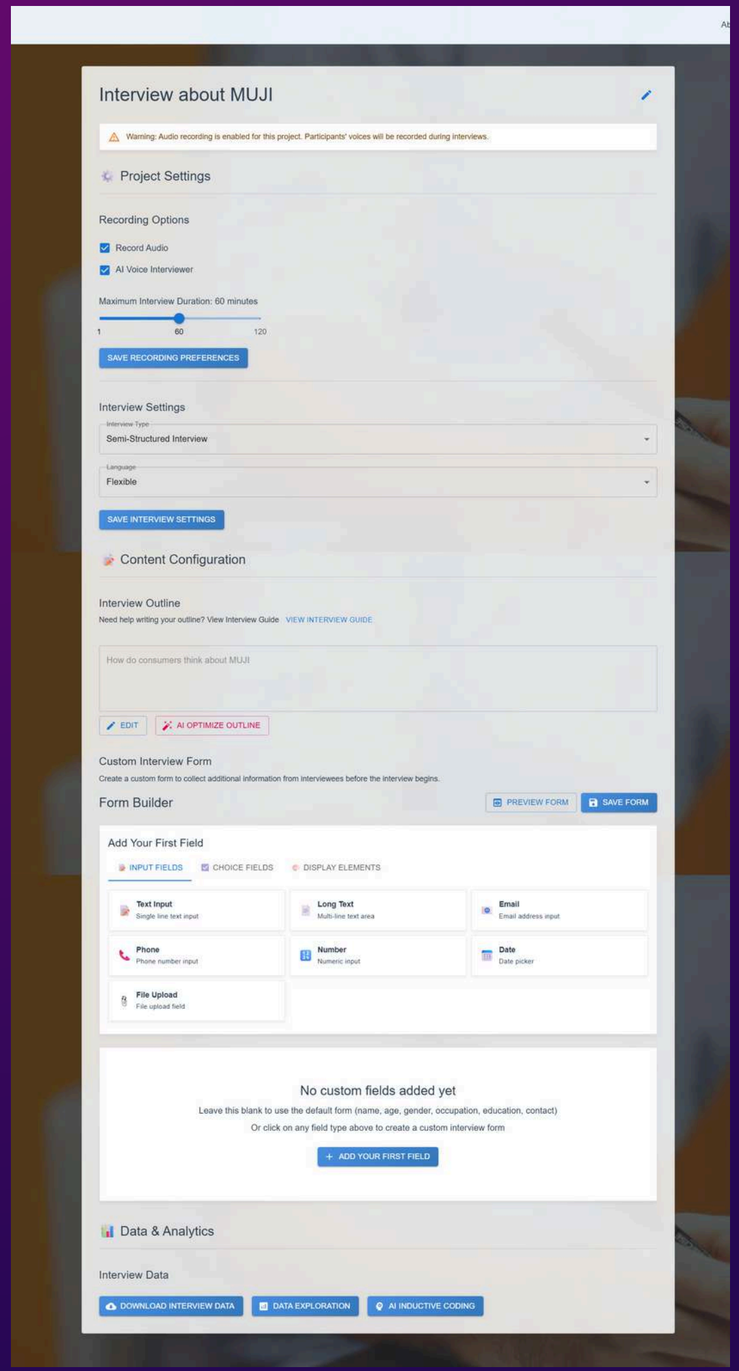


QualiTaTi

MIMITALK.APP



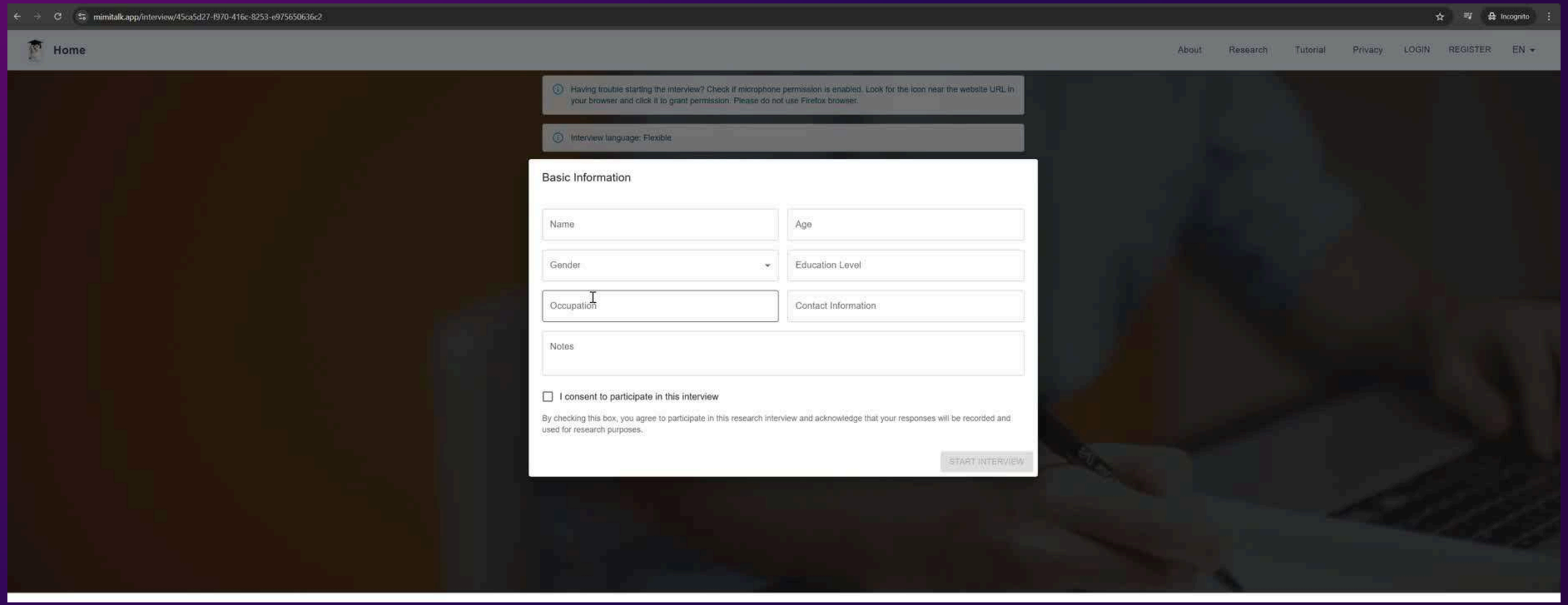
QualiTaTi



INTERVIEW OUTLINE

RECORD AUDIO
INTERVIEW TYPE
LANGUAGE
MODALITY
DURATION

CUSTOMIZED INTERVIEW FORM AND PAGES

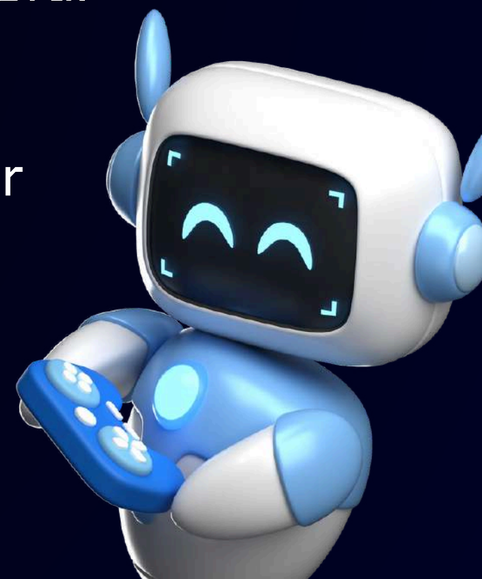

mimitalk.app/interview/45ca5d27-f970-416c-8253-e975650636c2
Incognito
Home
About
Research
Tutorial
Privacy
LOGIN
REGISTER
EN
Having trouble starting the interview? Check if microphone permission is enabled. Look for the icon near the website URL in your browser and click it to grant permission. Please do not use Firefox browser.
Interview language: Flexible
Basic Information
Name
Age
Gender
Education Level
Occupation
Contact Information
Notes
I consent to participate in this interview
By checking this box, you agree to participate in this research interview and acknowledge that your responses will be recorded and used for research purposes.
START INTERVIEW

QualiTaTi

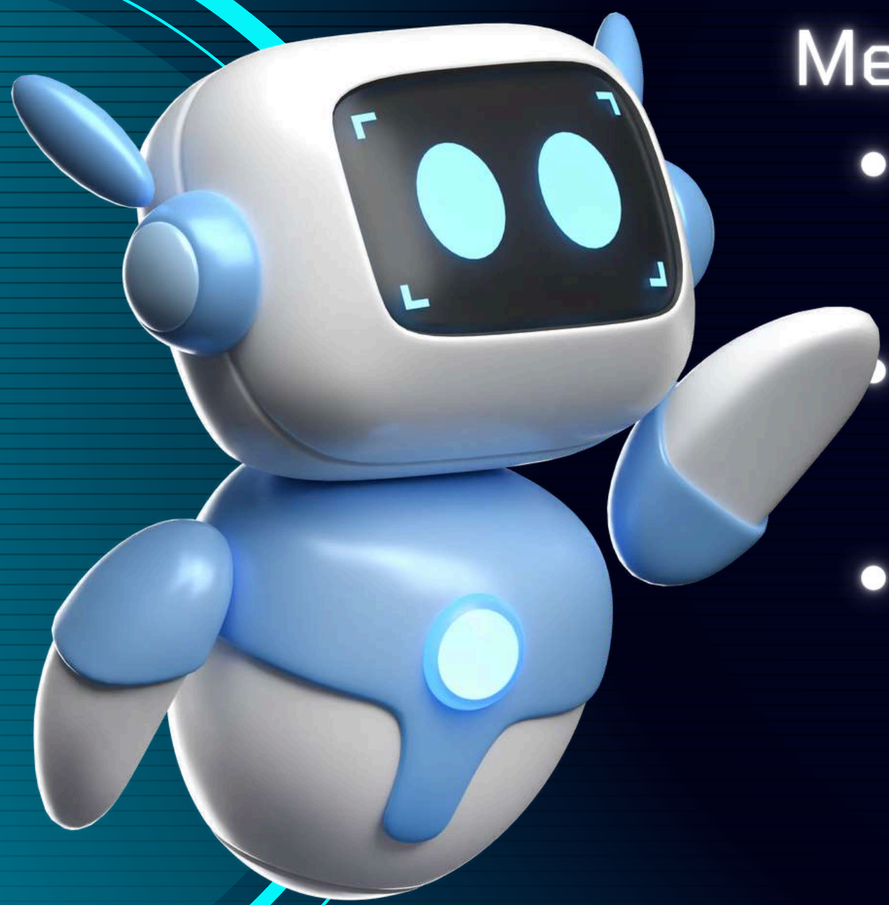
4 USER RESEARCH

COHERENT CONVERSATIONS	High semantic similarity scores 0.82
INTENTION TO USE	Positive reuse intention
EASE OF USE	Easy to use and less stressful
RESOURE REDUCTION	20 interviews within 1 hour
COST EFFICIENT	Only cost less than 10 dollars

QualiTaTi

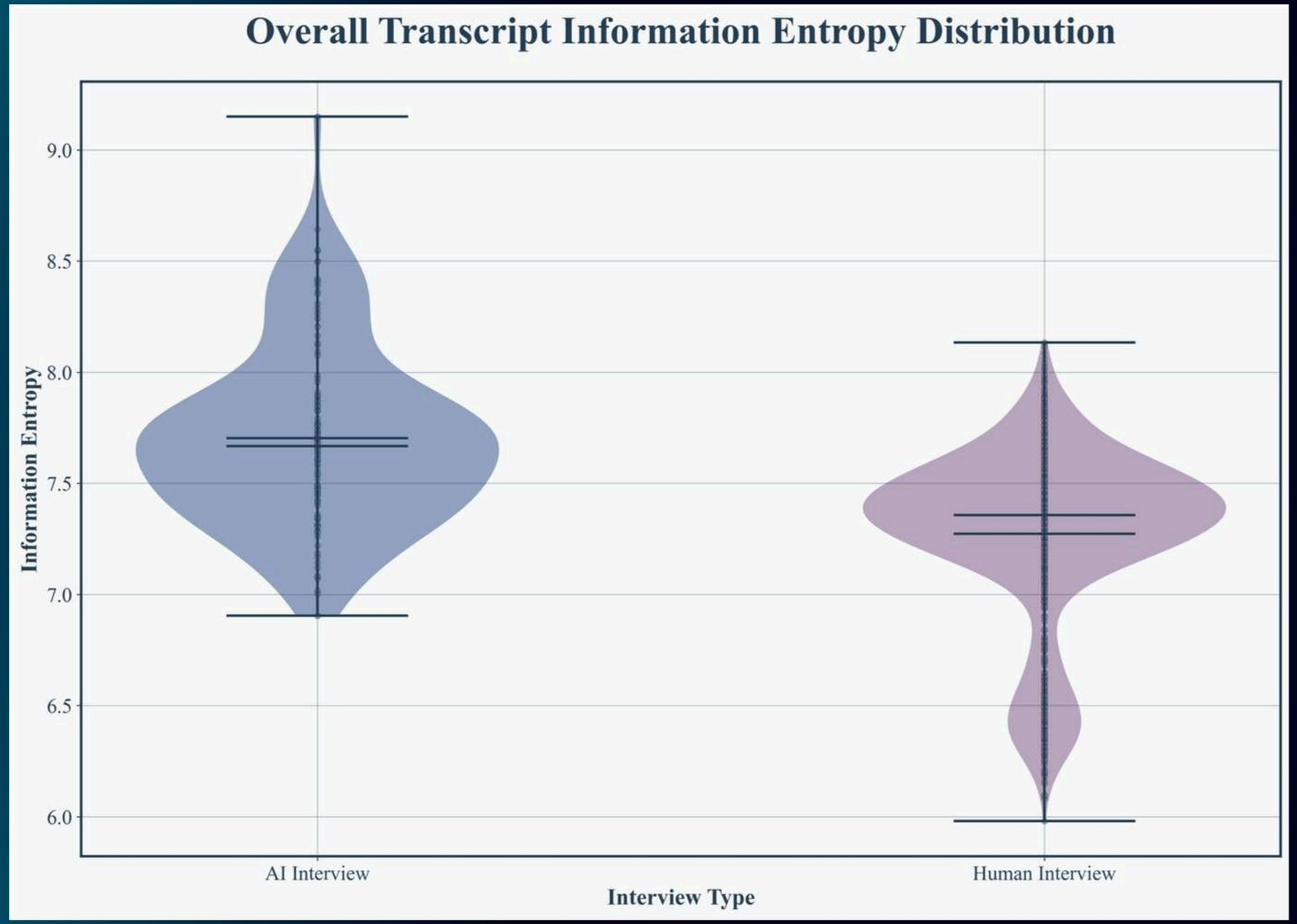


4 AI VS. HUMAN INTERVIEWER COMPARISON

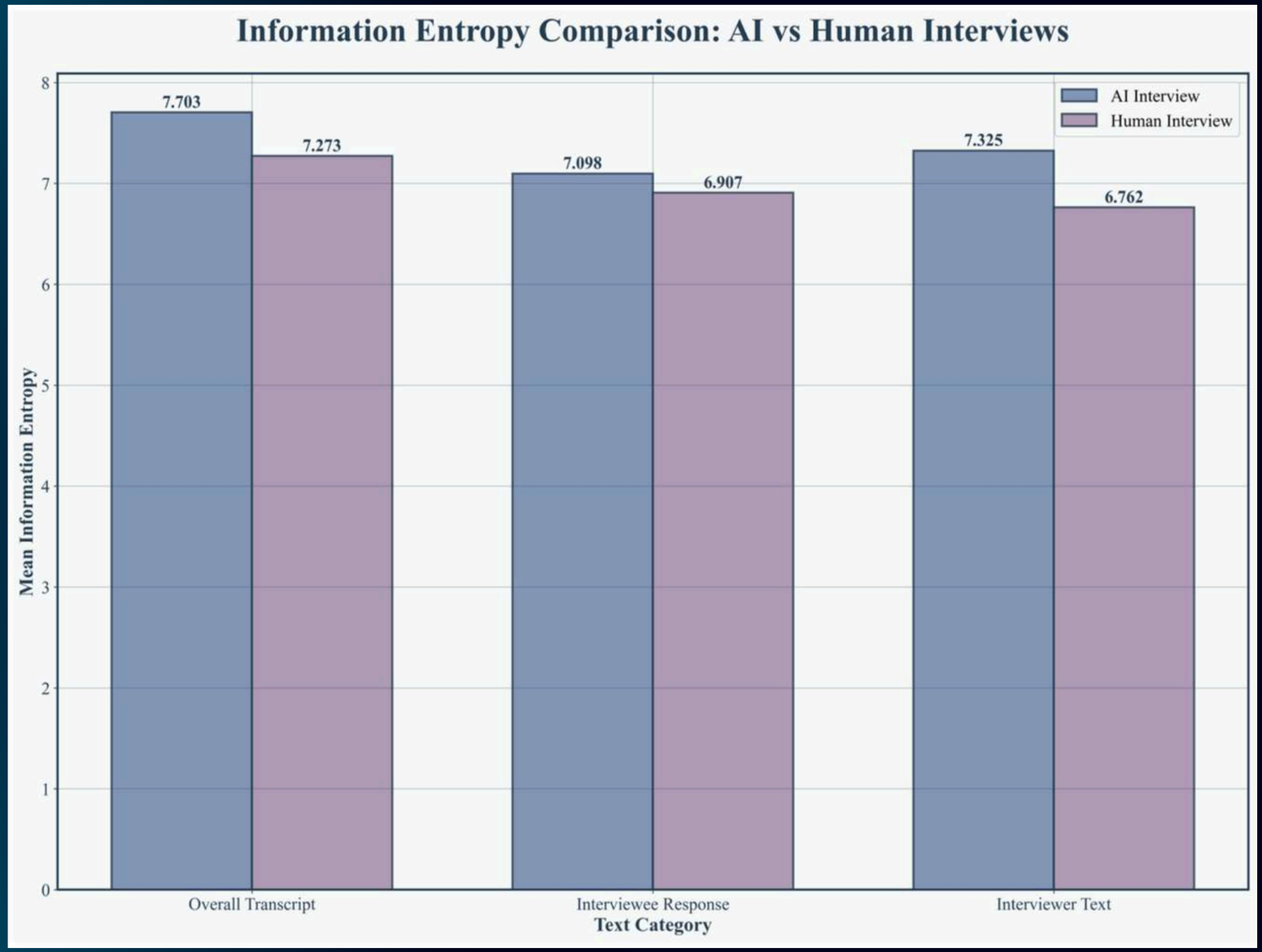


Measurement

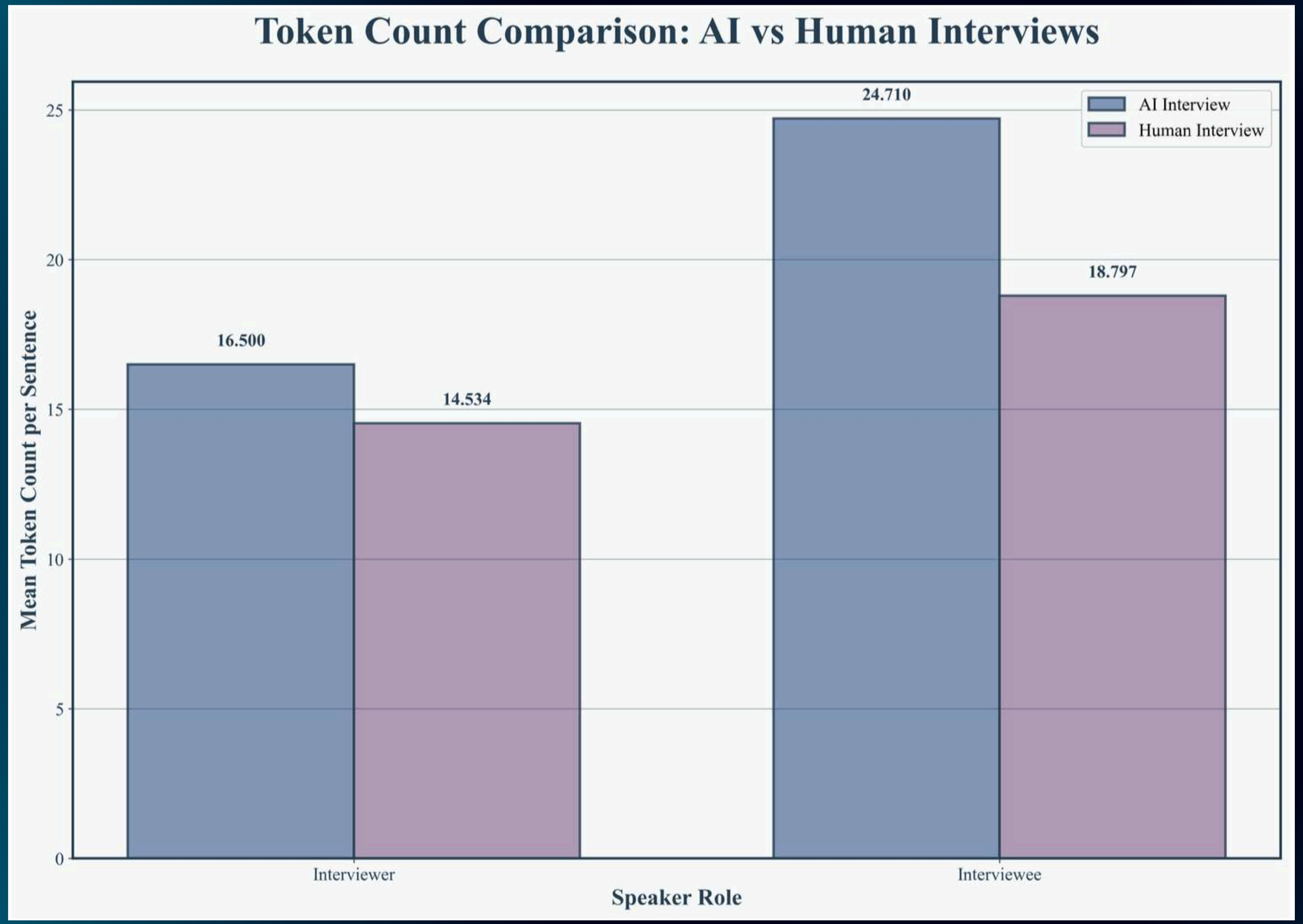
- Information entropy (measures how informative an interview is)
- Token count (measures the length of a question or answer)
- Internal semantic similarity (assesses consistency across different interviews)



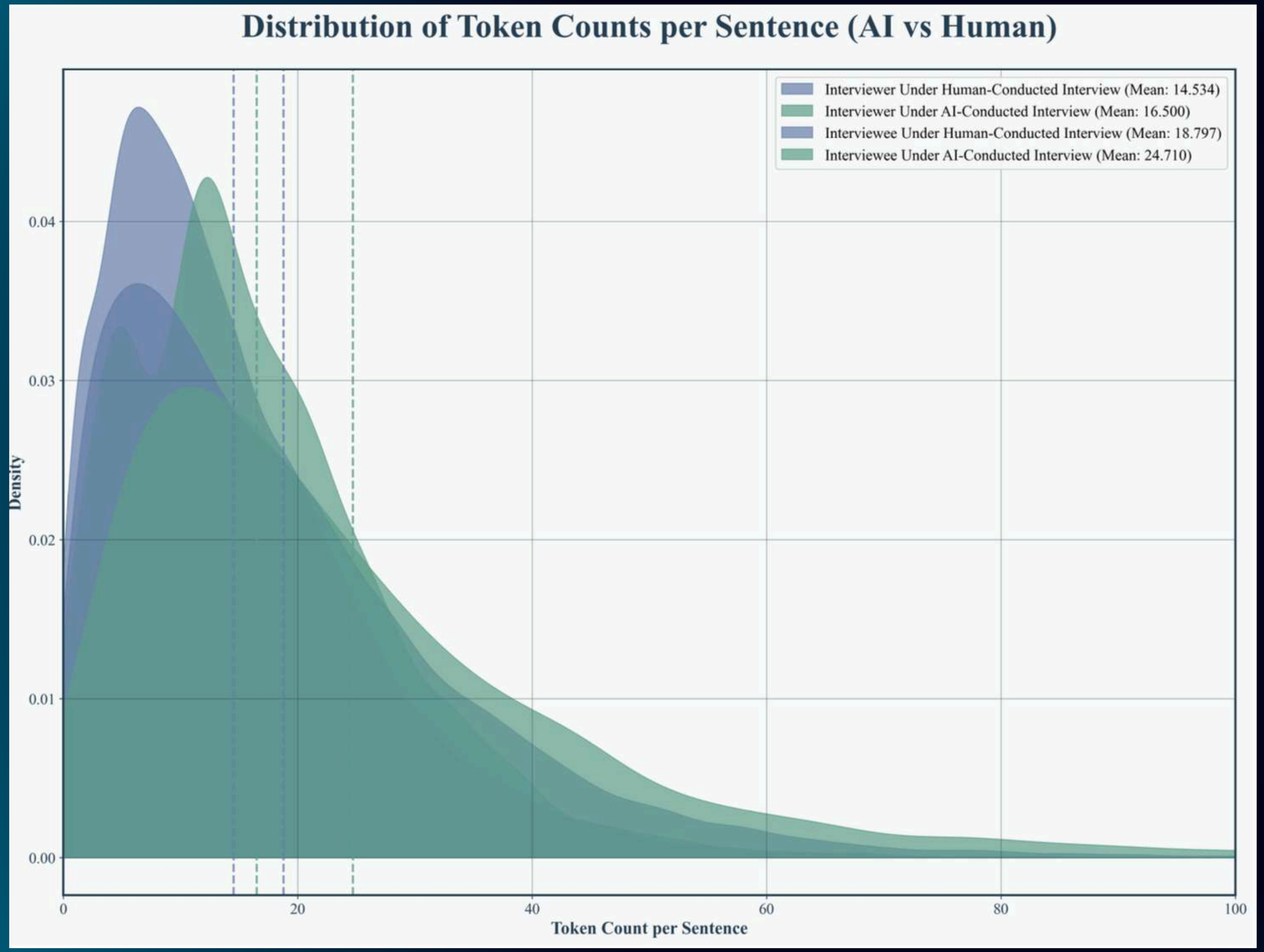
AI interviews have higher information entropy, which reflects greater informational complexity.



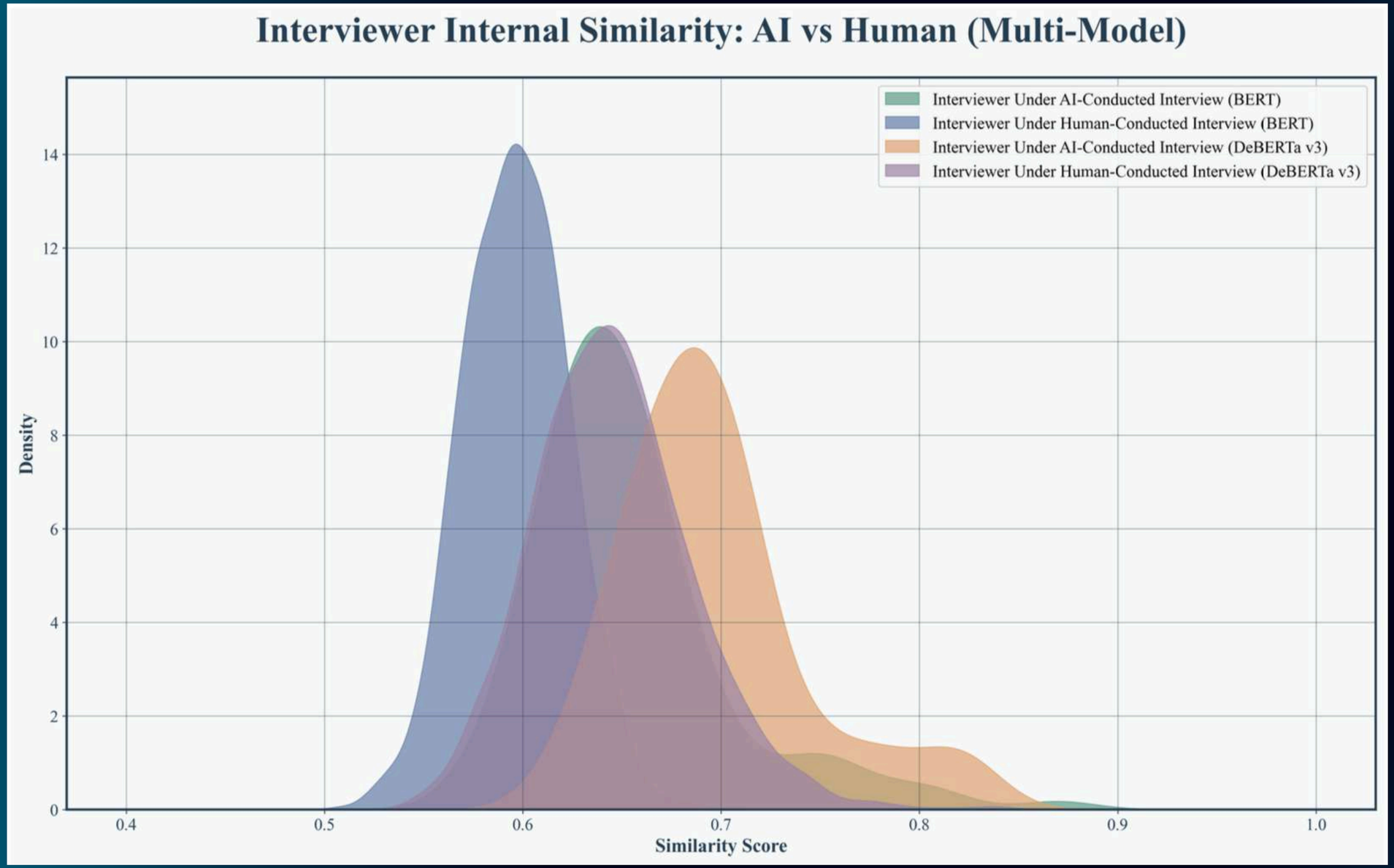
AI interviews might capture more diverse perspectives or unexpected insights.



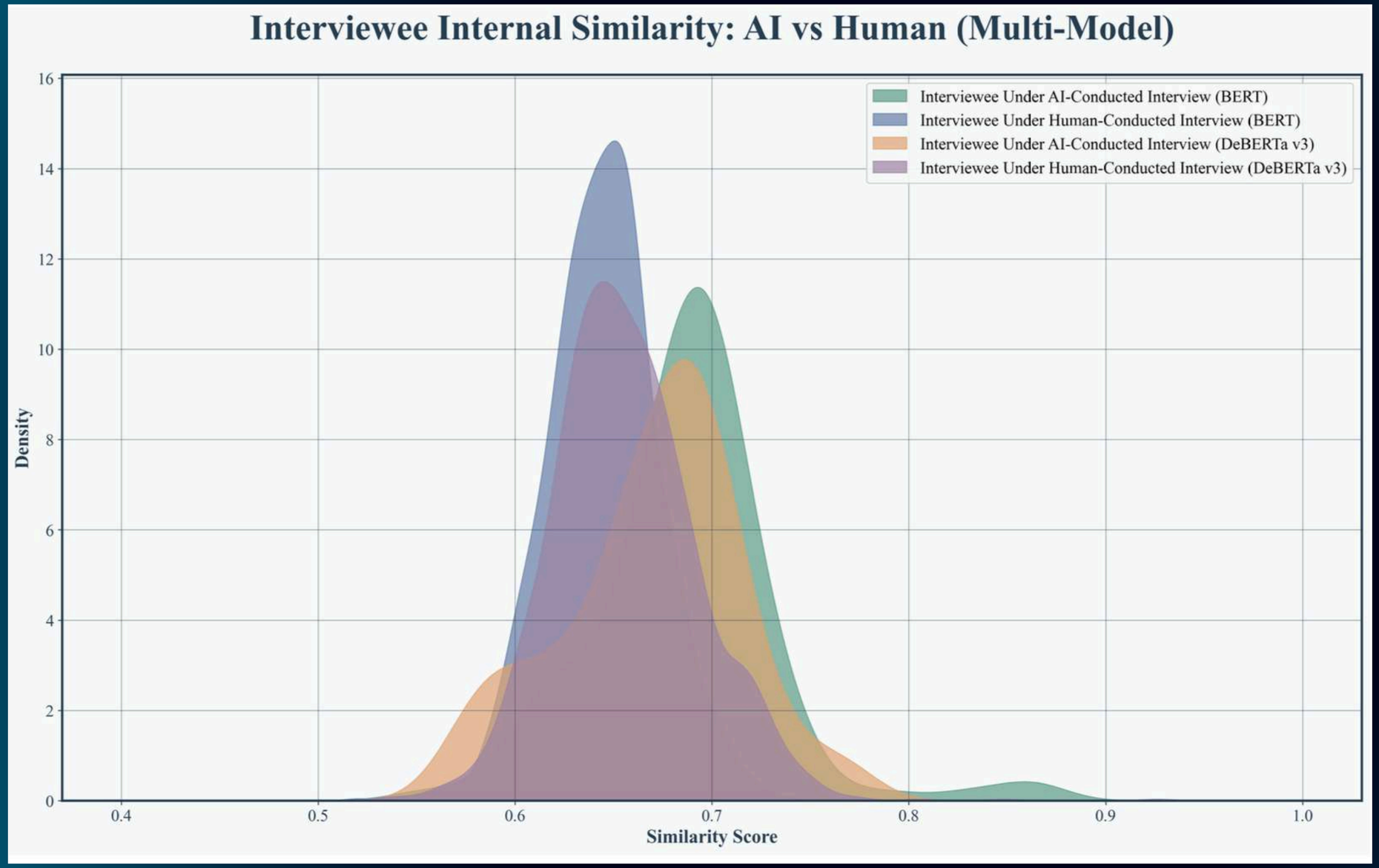
AI interviews have a longer length, which allows for the inclusion of more information.



AI interviewers tend to ask longer questions. Interviewees being interviewed by AI tend to give longer answers.



AI interviewers's questions tend to be more consistent across different interviews.



Interviewees tend to provide more consistent answers across different interviews when asked by AI.

Table 1. Descriptive Statistics

Metric	AI Mean	AI Std	Human Mean	Human Std	Diff.	Impr.
Information Entropy						
Overall Transcript	7.703	0.399	7.273	0.395	+0.430	+5.9%
Interviewee Response	7.098	0.791	6.907	0.446	+0.191	+2.8%
Interviewer Text	7.325	0.512	6.762	0.401	+0.563	+8.3%
Sentence Length (Token Count)						
Interviewer	16.500	11.614	14.534	11.269	+1.966	+13.5%
Interviewee	24.710	22.232	18.797	15.453	+5.913	+31.4%
Semantic Similarity (DeBERTa-v3)						
Interviewer Internal	0.697	0.047	0.646	0.040	+0.051	+7.9%
Interviewee Internal	0.669	0.045	0.656	0.037	+0.013	+2.0%
Cross-Speaker	0.652	0.043	0.643	0.029	+0.009	+1.4%
Semantic Similarity (BERT-base)						
Interviewer Internal	0.654	0.049	0.596	0.027	+0.058	+9.7%
Interviewee Internal	0.686	0.045	0.645	0.028	+0.041	+6.4%
Cross-Speaker	0.623	0.052	0.606	0.022	+0.017	+2.8%

Table 2. Statistical Significance and Robustness Analysis: AI vs Human Interview Performance

Metric	t-stat	t p-value	Cohen's d	95% CI	Mann-Whitney U	U p-value	Effect Size
Information Entropy							
Overall Transcript	11.431	5.54e-29	1.087	[0.908, 1.262]	119266	1.15e-23	Very Large
Interviewer Text	11.706	2.98e-22	1.364	[1.133, 1.591]	125284	2.29e-30	Very Large
Interviewee Response	2.601	1.04e-02	0.392	[0.034, 0.696]	100292	3.07e-08	Medium
Token Count (Total)							
Overall Interview	10.225	4.22e-18	2.291	[1.946, 2.691]	129054	5.22e-35	Very Large
Interviewer	8.487	6.38e-14	2.307	[1.941, 2.892]	138449	4.49e-48	Very Large
Interviewee	8.103	4.53e-13	1.657	[1.318, 2.033]	113470	4.89e-18	Very Large
Semantic Similarity (BERT-base)							
Interviewer Internal	12.626	3.67e-24	1.968	[1.720, 2.218]	136153	1.10e-44	Very Large
Interviewee Internal	9.770	3.60e-17	1.390	[1.111, 1.663]	123215	6.18e-29	Very Large
Cross-Speaker	3.657	3.77e-04	0.680	[0.355, 1.002]	98908	7.27e-08	Large
Semantic Similarity (DeBERTa-v3)							
Interviewer Internal	13.159	2.35e-37	1.252	[1.045, 1.460]	124328	3.05e-29	Very Large
Interviewee Internal	3.129	2.15e-03	0.353	[0.126, 0.558]	94128	2.16e-05	Medium
Cross-Speaker	2.249	2.62e-02	0.292	[0.037, 0.568]	89101	2.27e-03	Medium
Semantic Similarity (Cross-Model Average)							
Interviewer Internal	13.185	1.12e-25	1.827	[1.588, 2.077]	135486	1.01e-43	Very Large
Interviewee Internal	7.381	1.65e-11	0.941	[0.696, 1.202]	111667	3.84e-17	Very Large
Cross-Speaker	3.288	1.31e-03	0.544	[0.215, 0.863]	94127	2.16e-05	Large

MIMITALK USERS

1620 registered users

5439 interviews conducted

1088 projects

Weekly active visitors 300

2 university partners

NEXT STEPS

QualiTaTi

Thankyou

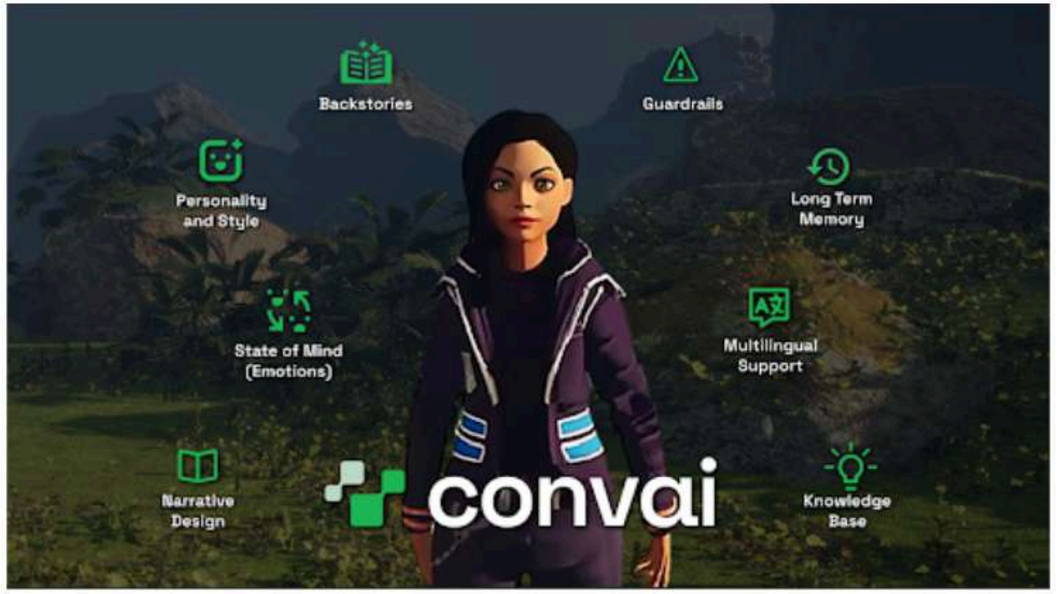
https://mimitalk.app
contact me: yu@hec.fr

GenAI in Business Communication

LSB Luxembourg School of Business

Business communication

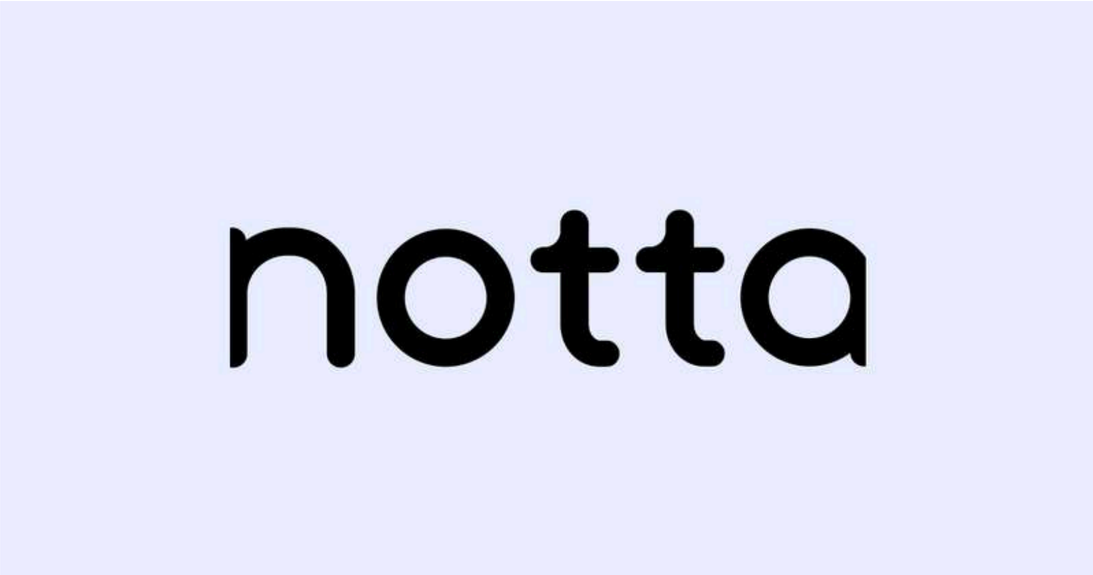
Tool: Virtual world



Tool: Grammarly

- Free option
- Multi-functional: shorten, paraphrase, “deAI”
- Can be integrated into different apps and systems

Tool: Notta



- Record meeting
- Summarize meeting
- Provide action items

Tool: Gamma

GenAI in Start-ups

How GenAI empowers solopreneur