AI-HED
Artificial Intelligence in Higher Education Teaching and Learning

Training on AI in HEIs

University of Zagreb Faculty of Organization and Informatics

ERASMUS+ COOPERATION PARTNERSHIP

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This document contains some of the results and deliverables of the Artificial Intelligence in Higher Education Teaching and Learning (AI-HED) project.

AI-HED
Artificial Intelligence in Higher Education Teaching and Learning

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Language models and other AI-based tools were used in the process of creating this document.

AI-HED
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Contents

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Training Materials

This chapter contains the materials used in the workshop. The content covers a description, two use cases, and one step-by-step example of how to use the described AI-based tool in higher education setting.

The following tools are used in the workshop part of this training:

- ElevenLabs, section 1.1
- Perplexity, section 1.2
- Le Chat, section 1.3
- Suno, section 1.4
- invideo AI. section 1.5

We expect teachers to use the exemplified AI-based tools to form a use case related to their experience in teaching and show how AI-based tools, possibly the ones described here, could be used in that context.

The goal of this workshop is to use the tools presented here and experience, observe, and discuss the many perspectives of their use, such as: to make a class more engaging, to enhance class materials with multimedia content, to convert class materials to multimedia content, to foster student engagement, to increase class participation, to make better plans for the classroom, to devise new and improved course materials, to produce more interesting activities for students, to develop a way to assess students with or without the use of AI, to evaluate if AI-based solutions could be used for any of the above, to observe how students might use AI-based tools to solve their current assignments, to raise awareness about how AI-based tools can be used for cheating, to become aware of the power of AI-based tools, and many more.

The above AI-based tools and platforms hve been chosen on the basis of content diversity, accessibility, and usability potential in teaching or learning processes.

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Assignment

Try out the described AI-based tools and design a case for their use in your teaching process. The results are welcome to be presented during the second session of the training.

ElevenLabs

ElevenLabs is an advanced text-to-speech service that uses deep learning to create human-like voices from input text. It supports many languages and accents. Users can fine-tune voice speed, pitch, and style, which helps create engaging audio output for lectures, podcasts, learning materials, etc. The platform's algorithms rely on large datasets of recorded speech to learn speech patterns, allowing for impressive natural-sounding voices in the generated output. Educators can upload scripts or text documents and receive lifelike spoken content in a flash. Students with reading, visual, or learning difficulties can also benefit from this tool. They can listen to course materials instead of reading them on screen. The intuitive interface makes it simple to use quickly and easily.

ElevenLabs offers reliable and user-friendly text-to-speech functionality for diverse domains, including higher education needs. In this context, it aims to make learning more accessible and enjoyable.

Use Case Examples

Creating Audio Lectures for Online Courses

Faculty members often face a challenge where some students struggle to keep up with reading assignments, which can slow the students' progress. With ElevenLabs, instructors can convert lecture notes or textbook excerpts into lifelike audio versions. They simply upload the text into the platform, choose a suitable voice, and wait for the output to be generated in a few minutes. A clear recording of the input text is the generated output that can be shared with students. They can download these audio files and listen to them while commuting, doing household chores, or working out. The added flexibility helps busy learners manage their time better and still engage with the content. In addition, those who prefer auditory learning can focus more effectively. Educators can customise the generated voice's pacing, tone, or accent, a customisation option that promotes inclusivity by considering different dialects or languages and student backgrounds. One of the benefits of using such a tool in large classes is reduced need

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for repeated verbal explanations or delays and failure induced by reading difficulties. Instead, professors can share the generated audio file with students. Although the rendered output may not be perfect, this approach is efficient and engaging, saving the teacher's time while enhancing educational reach. Once the audio files are created, they can be hosted on a learning management system. Students can access them anytime, which may be particularly helpful for learners who speak English as a second language. They can listen at their own pace and replay tricky sections to streamline routine learning tasks.

Converting Documents for Visually Impaired Students

Many universities aim to provide equal access to learning materials for all students. With ElevenLabs, departments can convert important documents, such as handbooks, syllabi, or research articles, into high-quality audio. Such an approach could help visually impaired students stay on track with course requirements and related administration. By generating a natural-sounding narration, these resources become more engaging, accessible, and easier to comprehend. Staff can quickly upload a PDF or text file and then set voice characteristics they want to represent them that fit student needs. If a student prefers a slower speed or a specific accent, the settings can be adjusted in a few clicks. This personalised approach is crucial for accessibility. Teachers and staff do not have to record themselves reading documents, thus saving time and increasing productivity. Instead, they can ensure that the automated audio is accurate and well-organised. Once generated, files can be shared via email or stored on a central accessibility portal, ensuring students can retrieve the resources anytime. Universities can use these features to promote a culture of equal opportunity in every course.

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Step-by-Step Example

The following steps are based on the first example presented above.

1. Create an ElevenLabs account by visiting the official website and clicking ‘Sign Up’: https://elevenlabs.io. Fig. 1.1
2. Once logged in, locate the text-to-speech feature on the main dashboard. Fig. 1.2
3. Paste your lecture notes into the provided text box. Should you wish to generate narration of a file, use ‘Studio’ in the menu, then the ‘Create an audiobook’ feature. Fig. 1.3
4. Choose your preferred voice, language, and speaking style from the available options. Fig. 1.4
5. Adjust the available settings if desired.
6. Click ‘Generate speech’ or a similar applicable button if this exact one is not available to convert input text.
7. Wait a few seconds for the system to process your request.
8. Preview the audio to ensure clarity and correctness using the built-in player. Fig. 1.5
9. Download the final file using the button on the right-hand side of the built-in player. Fig. 1.5
10. Share the audio via your learning management system or email so students can access it anytime.

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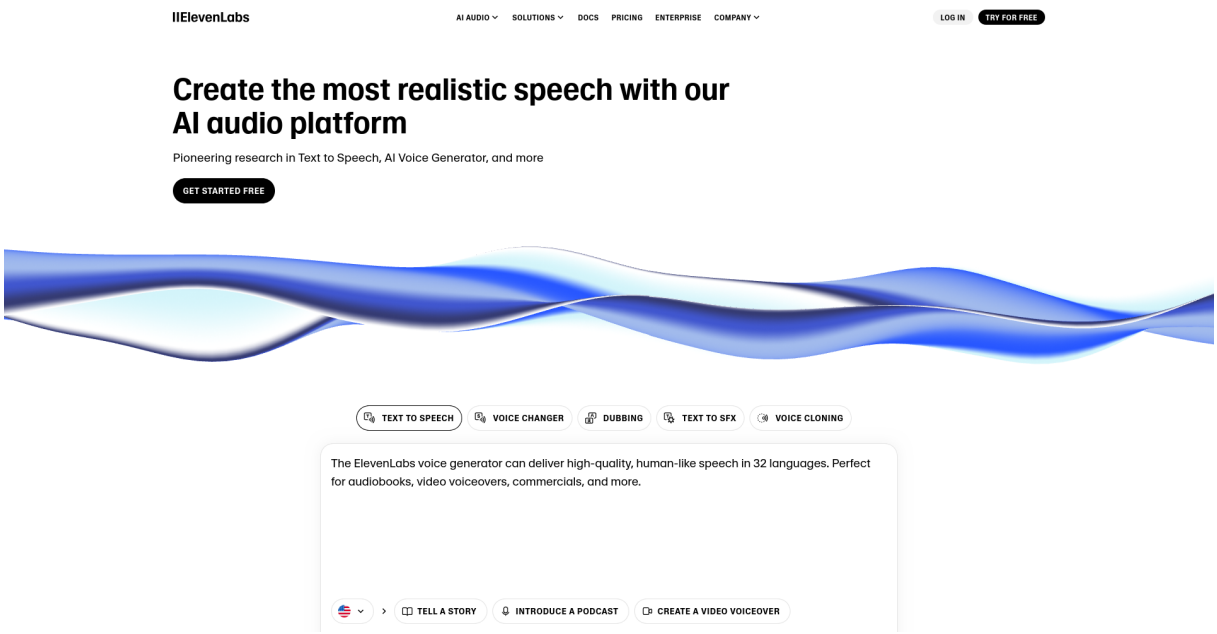

Figure 1.1: Official website of ElevenLabs

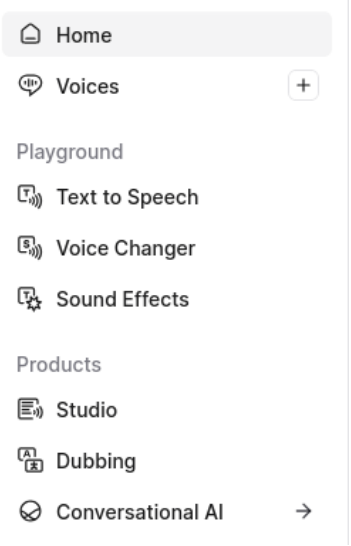

Figure 1.2: Menu of the main dashboard ElevenLabs

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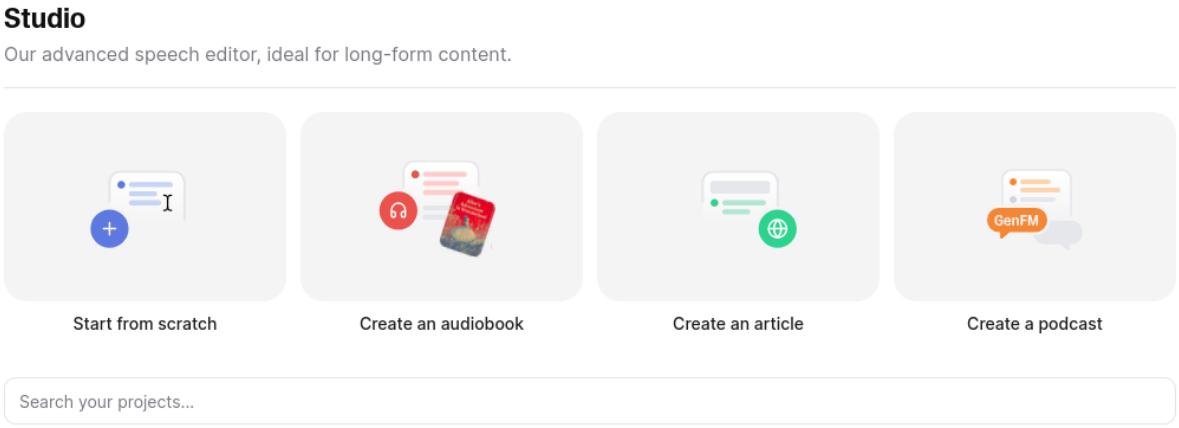

Figure 1.3: Studio menu of the ElevenLabs Studio product

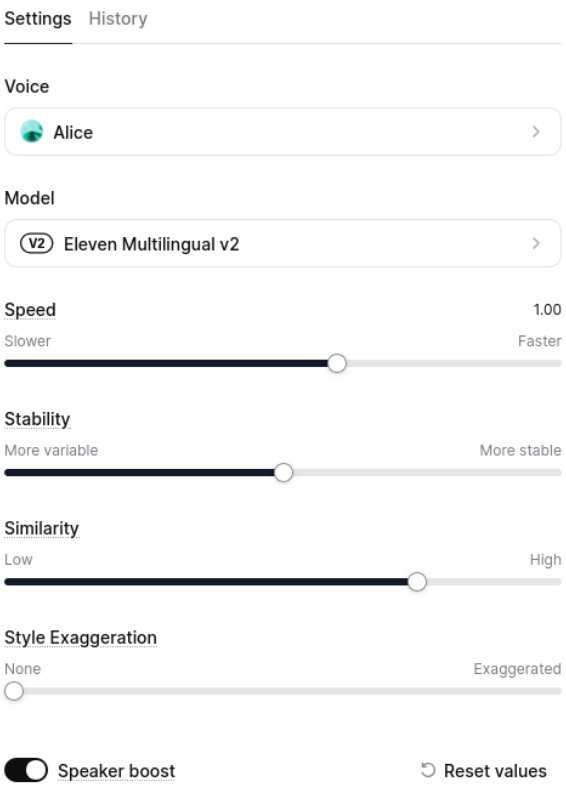

Figure 1.4: Voice settings in ElevenLabs

Figure 1.5: Voice player in ElevenLabs

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Perplexity

Perplexity is a modern AI-powered research assistant. It uses advanced language models to sift through vast online content in seconds. Users type in a question or search term, and Perplexity provides concise answers from reliable online sources. This behaviour makes it suitable for quick fact-checking or in-depth research. Perplexity aims to condense long articles into summaries that offer focused insights. It can also offer alternative perspectives on the same topic, supporting the discussion idea. For university professors, this translates to easy access to well-organised references for lesson planning. For students, it streamlines the process of finding credible information for assignments. The tool's simple interface allows users to see relevant sources at a glance to verify claims found in online content, in-person discussions, classes, and related materials. Because it draws on public databases, it stays current with the latest developments. By integrating Perplexity into daily tasks, educators and students save time and enhance the accuracy of their academic work.

Use Case Examples

Quick Topic Overviews for Class Preparation

When instructors need to introduce a new topic, they often spend hours searching for applicable, reliable, and accessible references. Perplexity speeds this up. Imagine a professor planning to teach about cyber ethics. Instead of opening multiple browser tabs and scanning long papers, articles, and blog posts, they simply type 'key concerns in cyber ethics' into Perplexity. Within moments, the tool gives them a concise summary of the topic and suggests relevant sources. This result allows the professor to receive an overview of emerging issues related to the searched-for topic, such as data privacy and misinformation. Each result within the set of references links to the source so that the user can confirm or contest its credibility. The professor can then share these sources with students for further reading, should they wish to do so. This fosters an evidence-based approach to learning. Class discussions can be more focused and informed by providing learners with a quick overview of important points and accompanying sources. Perplexity's streamlined interface means less time wasted on numerous, often irrelevant search engine results. The teaching process and class preparation thus become more efficient. Once ready, the lecturer can present highlights to the class. Afterwards, everyone can explore extended readings at their own pace because a conversation can be shared via a public link. Perplexity becomes a good solution for knowledge curation and sharing. Vigilance is suggested, nonetheless, as the found and suggested sources must be checked and evaluated.

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Building a Shared Reading List for Research Projects

Students often need a structured way to find and share academic resources. Perplexity helps them collect good quality references quickly. Let us consider a group of post-graduate students in environmental science who want to study ocean plastic pollution. They can enter the prompt 'Recent studies on microplastics impact' in Perplexity and let the automated research occur. When done, the tool shows them a list of found references along with short summaries. Each student can pick a handful of the sources they received from Perplexity based on the search it performed and add them to a shared document for other teammates to see. Verifying authenticity is easy because each result is presented with a link to where it can be found online, e.g., the original journal or paper. This approach can quickly gain insight based on several published sources and decide which sources should be read in more detail, which saves time and promotes collaboration. When writing a literature review paper or similar publication, the group can revisit the summarised data in Perplexity. Then, they can dive deeper into the most relevant sources. This organised workflow ensures team synchronisation while exploring a complex topic. Evaluating data gaps, noting contradictory findings, or identifying consensus points becomes more straightforward and less tedious. In the end, Perplexity acts as a dynamic research assistant, fostering teamwork and academic research by making resource discovery direct and efficient.

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Step-by-Step Example

The following steps are based on the first example presented above.

1. Go to the Perplexity website (https://www.perplexity.ai) and sign in if you want to save the conversation and be able to access it later. Fig. 1.6

2. Type in the prompt (a question or instruction), such as 'What are the main issues in cyber ethics?' Select desired sources using the globe icon. Fig. 1.7

3. Your input appears at the top of the page. Fig. 1.8

4. Look underneath your input for the found linked sources. Click on any source to visit it and verify credibility and depth. Fig. 1.8

5. If you want more detail, ask follow-up questions or start new conversations with a more detailed prompt.

6. Identify the points that are most relevant to your lecture or lesson plan.

7. Copy links and references into a separate document for future use.

8. Incorporate these insights into lecture slides or notes.

9. Provide your students with a list of curated links and summaries or the generated overview of the automated literature review.

10. Refer back to the Perplexity findings for a data-driven discussion and to further pursue answers. Fig. 1.9

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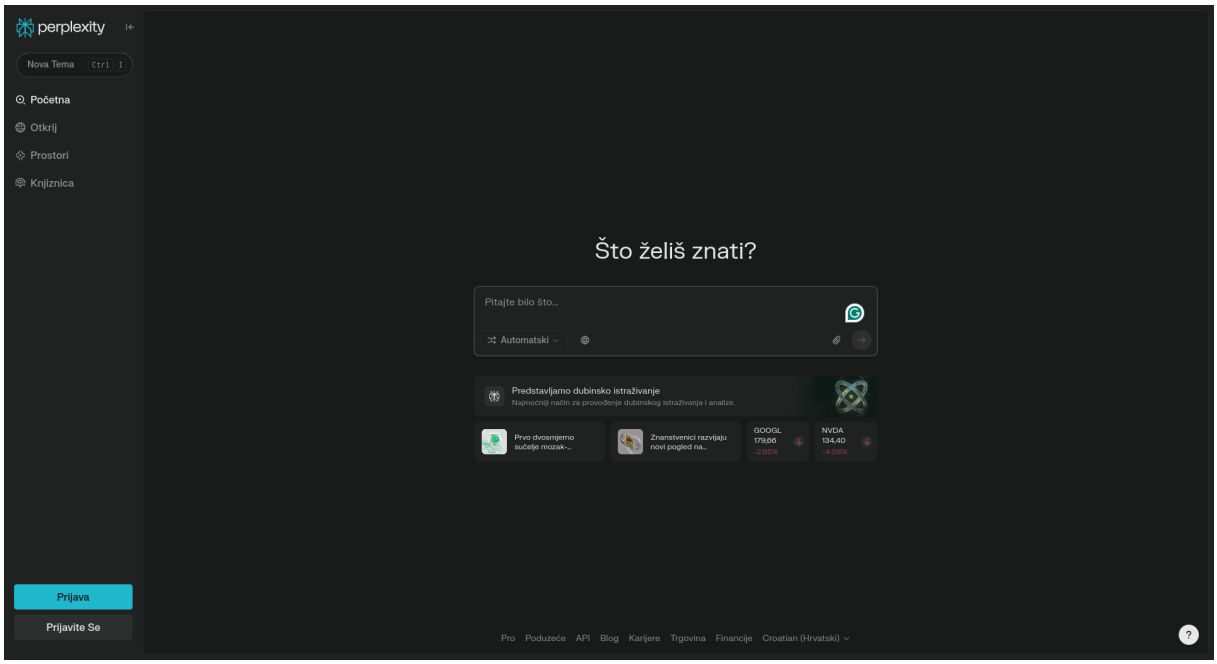

Figure 1.6: Official website of Perplexity

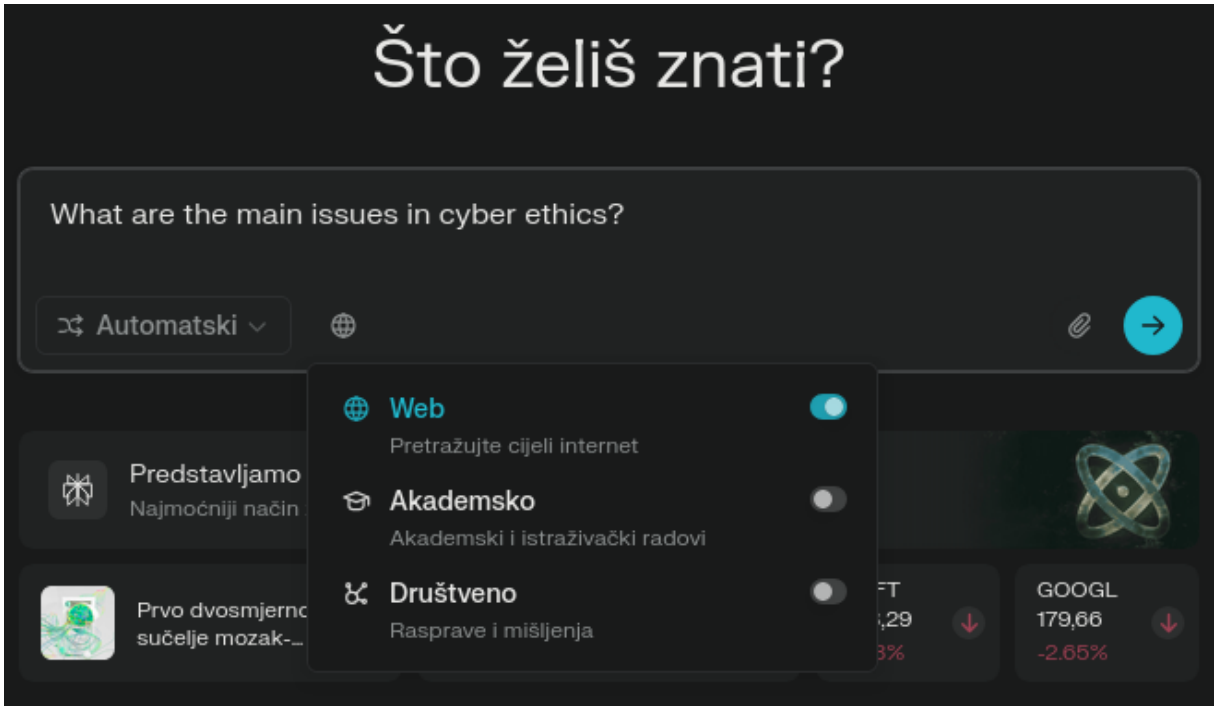

Figure 1.7: Entering prompt for Perplexity with interface localised in Croatian

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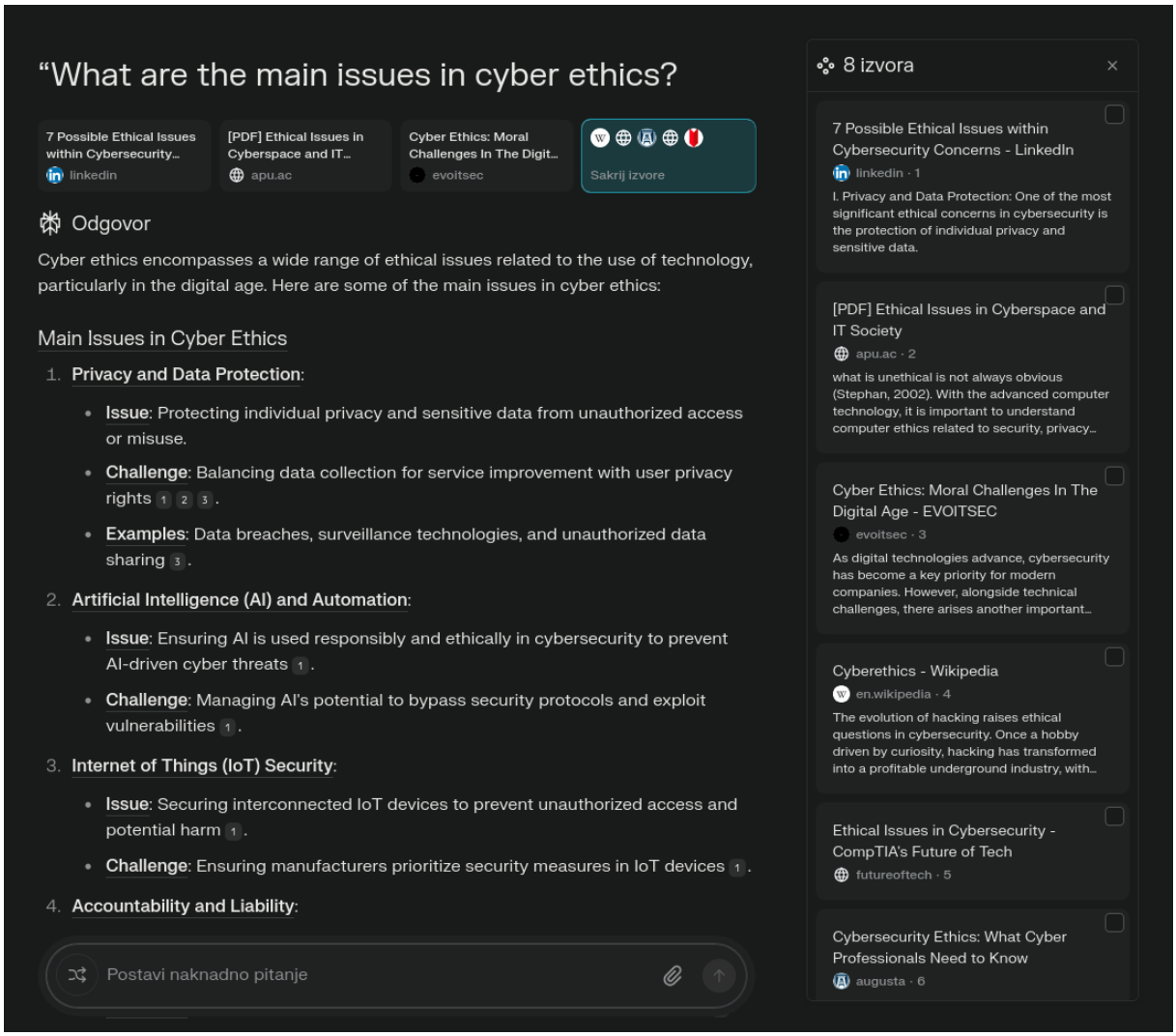

Figure 1.8: Generated response to the given input

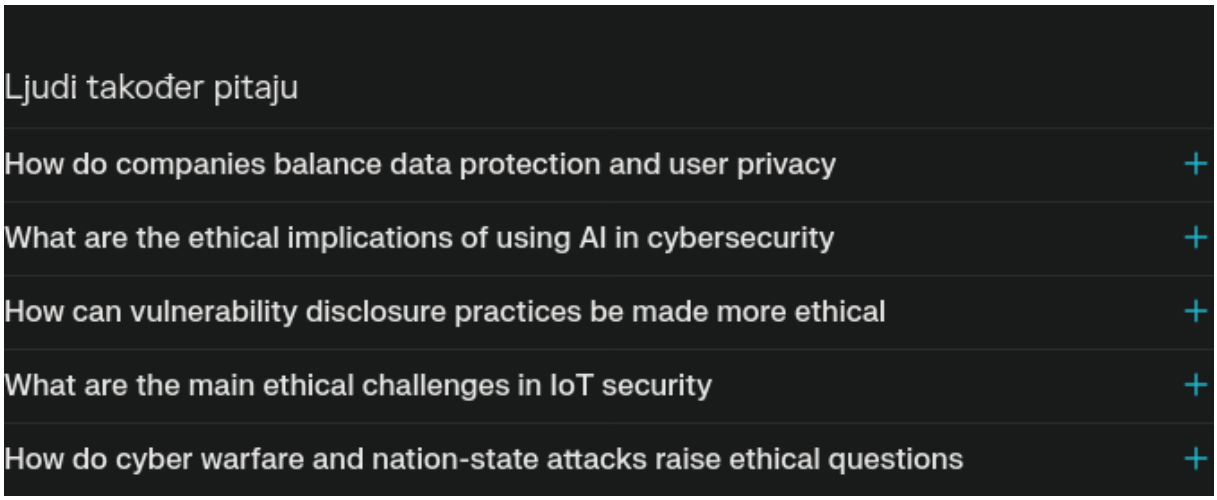

Figure 1.9: Questions for further research offered by Perplexity

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Le Chat

Le Chat is an interactive AI chatbot that helps students and faculty communicate, brainstorm, and troubleshoot problems. It is implemented by Mistral AI, a pioneering French artificial intelligence startup building the best open-source models in the world. It processes natural language queries and responds with coherent text. Additionally, it can generate images and help with programming code. It can interpret different types of questions by leveraging various machine learning algorithms. Unlike a static Q&A forum, it offers dynamic, context-aware conversations. For educators, Le Chat can serve as a virtual assistant, e.g. clarifying course concepts or summarising reading materials. Its intuitive and easy-to-use interface allows users to type questions and receive immediate, relevant answers. It promotes efficient self-study sessions and saves time for instructors who otherwise repeat the same explanations or students who prefer content delivered differently. Students can use Le Chat to review complex theories or solve practical problems, as it can point them to additional resources. The chatbot's design also supports multi-step reasoning, making it useful in subjects like mathematics or computer science. Its goal is to facilitate deeper learning through accessible and personalised interaction.

Use Case Examples

Tutoring Students in Complex Subjects

Many students get stuck on problem sets while studying and revising outside of class when teaching topics such as advanced calculus. Le Chat can guide them step-by-step by rendering targeted hints and explanations. A student might ask Le Chat 'How do I integrate x^2e^x?', and the chatbot responds with a step-by-step solution. Students who do not grasp a step can ask for further clarification. This back-and-forth approach to learning can help them grasp the logic behind integration in parts. Naturally, this approach applies to other knowledge domains and challenges therein. It is possible to integrate Le Chat into the learning management system that is used as well. This way, students would have a dedicated service to ask questions about the class materials day or night. The chatbot's responses can also point to additional sources of information, offloading repetitive tasks from teachers and allowing them to focus on deeper mentoring.

On the other hand, students can receive content in the most suitable way for their learning style. Moreover, students can ask for numerous additional exercises or examples based on the ones the teacher gave. Applying this approach to learning, stu-

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dents are expected to become more confident and independent in their learning. By giving near-instant feedback, Le Chat encourages consistent practice and fosters engagement. Users can store transcripts of past conversations for review, thus forming a valuable study record, which could later help them analyse and see their progress.

Brainstorming Project Ideas in Discussion Groups

In many classes, group projects have a slow start because students have difficulty deciding on a precise topic. This process can be made easier by using Le Chat to enhance or moderate a brainstorming session. Do students prompt Le Chat with a broad question, such as 'Suggested research topics on climate adaptation?' The chatbot replies with a concise list of possibilities, such as designing flood-resistant crops or analysing changes in local weather patterns. Group members then refine their choices – if they need more depth on a specific approach, they can ask follow-up questions. The AI provides relevant data sources or even potential project outlines. The group can then evaluate these ideas, saving hours of random online searches. The conversation with Le Chat is dynamic, i.e., the users can keep prompting the model by shifting or fine-tuning their focus until they find a suitable and agreeable topic. Teachers can also participate in the search process: they can review the generated transcripts with prompts to ensure the team is on the right path. This approach could motivate creativity, foster collaboration, and improve the efficiency of the involved students. In addition, everyone has a clear record of how they arrived at their final concept. Le Chat thus becomes a virtual team member, guiding the brainstorming process with consistent and unbiased input. It should be noted here that bias depends on many factors, including but not limited to data, model designers, etc.

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Step-by-Step Example

The following steps are based on the first example presented above.

1. Go to the Le Chat website: https://chat.mistral.ai. Sign up or log in if you want to have your conversations saved for future reference. Fig. 1.10

2. Type in your calculus or other subject-related question, for example 'What is the integral of x^2e^x?' Fig. 1.11

3. Review the chatbot's step-by-step explanation. Fig. 1.12

4. If you do not understand a part of the response or are interested in more details, type a follow-up, such as 'Explain how integration by parts works.'

5. Ask, 'Is there another way to solve this?' to see if Le Chat can offer a different approach. Fig. 1.13

6. Copy or export the dialogue for future reference and study sessions. Fig. 1.14

7. Ask for additional sources, e.g. 'Suggest further reading' or 'Can I see examples?' Fig. 1.15

8. Try a similar problem to confirm you have mastered the concept.

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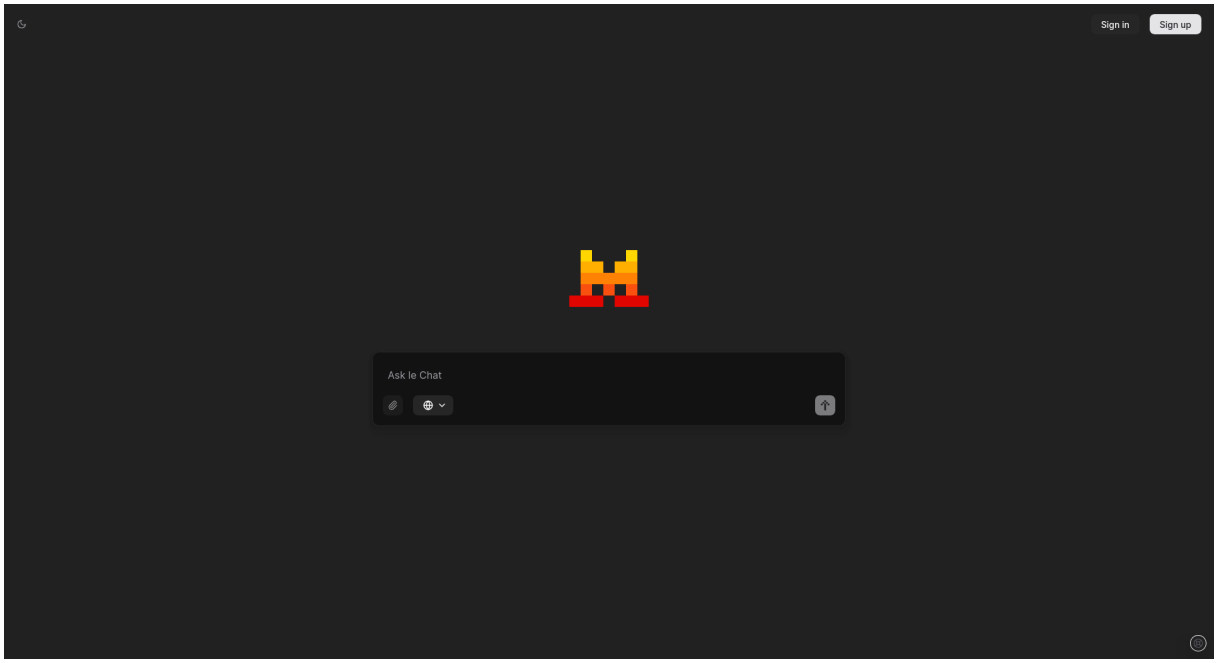

Figure 1.10: Official website of Le Chat

Figure 1.11: Giving a prompt to Le Chat

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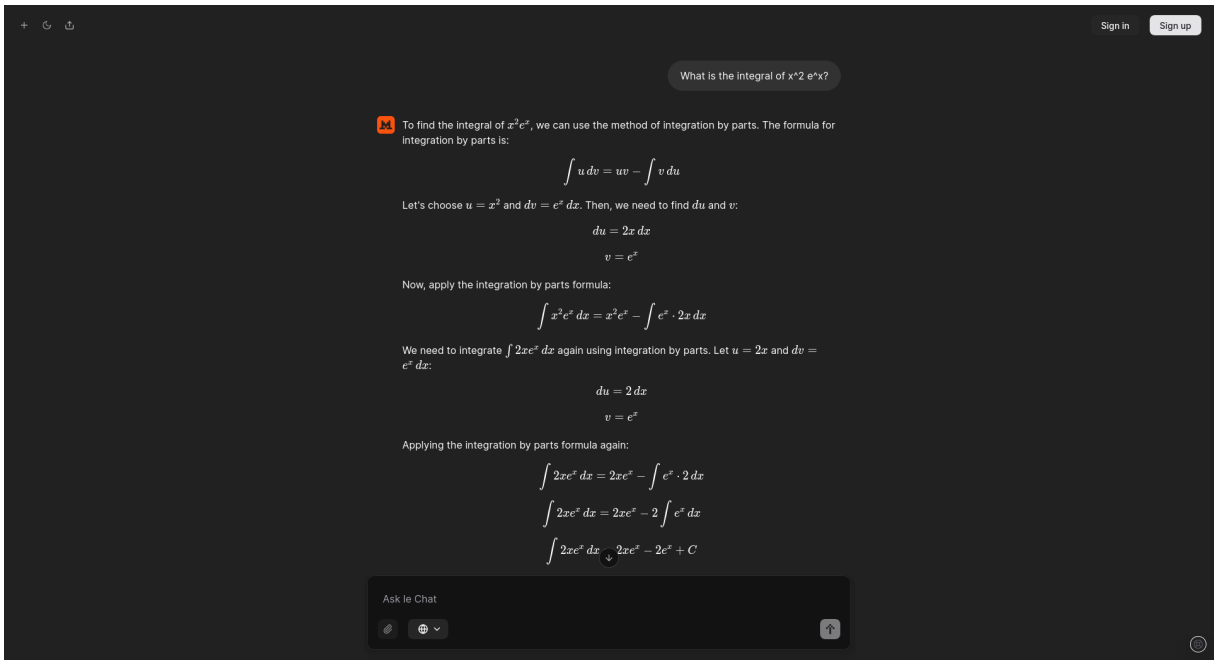

Figure 1.12: Generated response by Le Chat to the given prompt

Figure 1.13: Asking Le Chat an additional question

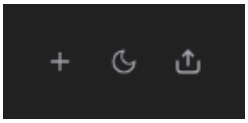

Figure 1.14: Share the current Le Chat transcript using the rightmost button

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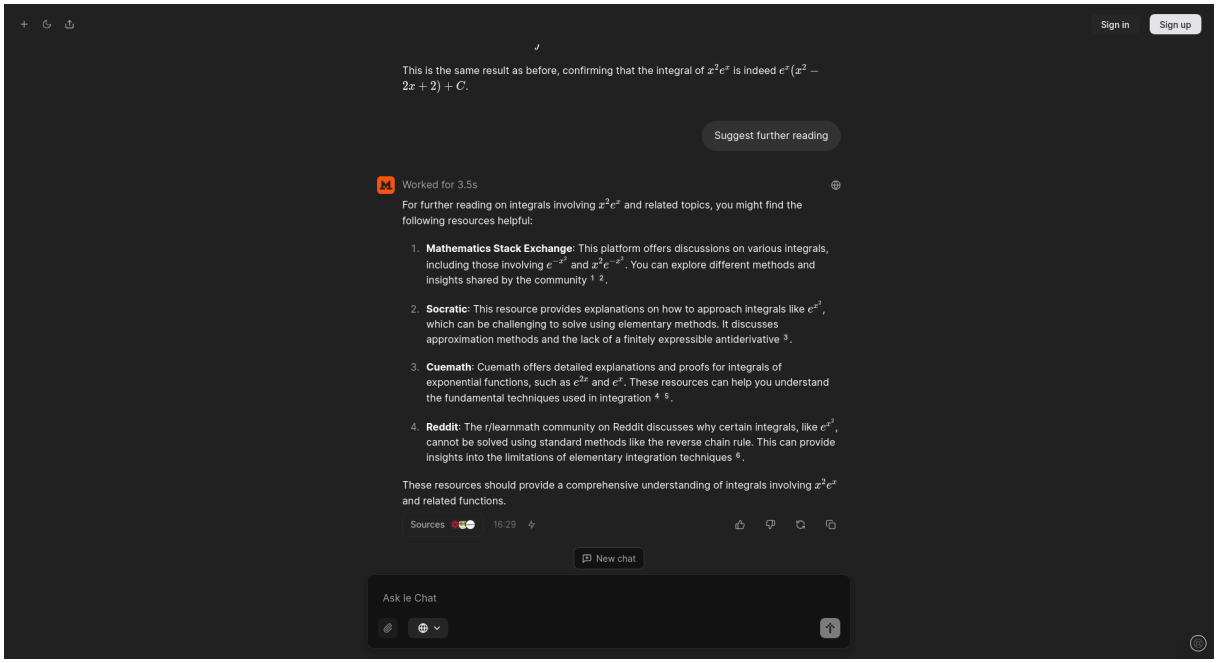

Figure 1.15: Le Chat providing further sources on the given topic

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Suno

Suno is a generative audio platform that lets users create various soundscapes, voices, or music based on text prompts. This platform utilises machine learning models trained on large datasets containing natural language voice recordings, music tracks, and sounds. As a result, it produces realistic audio clips with minimal input. In higher education, Suno can be a powerful tool for creating unique teaching materials or demonstrating various concepts of musing theory and related topics. Language teachers can use Suno to generate dialogues in different accents for practice sessions. Students and performing arts program faculty members can generate sound effects or musical loops for their classes and projects. Its user-friendly interface simplifies turning input text into potentially high-quality audio content. Users can also use it to produce sounds for videos or presentations. Suno saves time, encourages creativity, and enhances course materials in an accessible way using automated audio generation.

Use Case Examples

Generating a Custom Background Track for an Online Lesson

Music can set the tone for a presentation. Sometimes, instructors want a subtle soundtrack for their e-learning modules. With Suno, it is possible to type a short musical description, e.g. 'gentle piano music, ideal for background listening' and get a seamless audio clip. This music can loop without sounding repetitive and elevate, for example, a series of slides introducing ethics in business. A light, unobtrusive track helps students stay engaged without distracting them. Creating such a track is simple: open Suno, prompt the musical request and let the tool generate a piece of music based on the given prompt. It is possible to modify and refine the style if needed. Once the music is precisely what the user wants, it is possible to download the final file in MP3 format. This file can usually be imported into a presentation software of choice. As students progress through the slides, they hear the desired tune that can help them keep their focus or create an atmosphere depending on the course content. This approach may help boost the perceived quality of the delivered lesson or class materials, especially when teaching complex or abstract topics. Because Suno is AI-driven, the user saves time that would otherwise be spent searching for royalty-free music. The result is a unique, custom track tailored to the academic context aimed at.

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Creating a Thematic Soundtrack for a Student Film Project

Many college courses require group projects. Sometimes, those projects can be rendered as short videos, films, or documentaries. Finding the right soundtrack is often a challenge in such a scenario. Suno can simplify this task by generating customised audio backgrounds that fit the film's mood, setting, and goal. When students film a short drama about campus life, they want an uplifting instrumental to match scenes of daily routines, hanging out with friends, and enjoying life. A prompt such as 'light acoustic guitar, upbeat tempo, suitable for a college drama' might produce a unique piece of music that sets the right atmosphere.

Users can adjust tempo and intensity or add slight variations to match scene transitions. They can generate a softer, more reflective track if they switch to a more emotional moment. Because Suno saves prompts and outputs, revisiting any used prompt or its generated output is easy. Once a soundtrack is confirmed, it can be downloaded and integrated with the video material using the editing software of choice. This approach reduces the project's cost and time spent searching for commercial or royalty-free music. It also elevates the students' final product with a cohesive audio identity. Instructors can encourage more creativity by instructing students to refine or experiment with multiple styles, even some that are not combined in real life. Combined with the teacher's feedback, students can learn more interactively and experimentally how sound choices impact storytelling and overall film quality.

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Step-by-Step Example

The following steps are based on the first example presented above.

1. Go to the Suno (https://suno.com) website, create a new account if you do not have one already, and login. Fig. 1.16
2. Choose the Create option from the menu on the left to start creating music using Suno. Fig. 1.17
3. Type in the prompt, detailing the style, genre, and the piece of music that is the expected output, e.g. 'emotional, uplifting, contemporary R&B, light acoustic guitar, upbeat tempo.' Fig. 1.18
4. Listen to the generated clip to see if it matches the feel and aim of the content it should accompany. Fig. 1.19
5. Alter the prompt or add more details if you need a different instrument or a slower tempo.
6. Suno will create a new version based on the revised prompt.
7. Download the generated music you are satisfied with. Specific songs can be shared via link as well.
8. Use the generated music in the project of choice.

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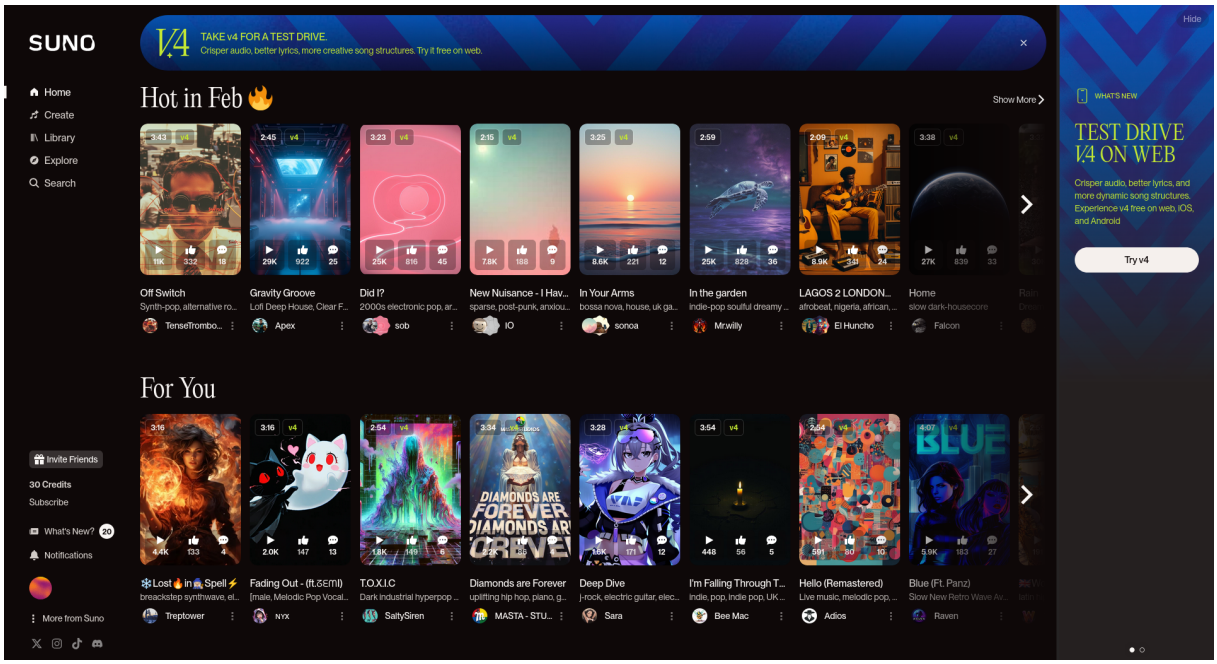

Figure 1.16: Official website of Suno

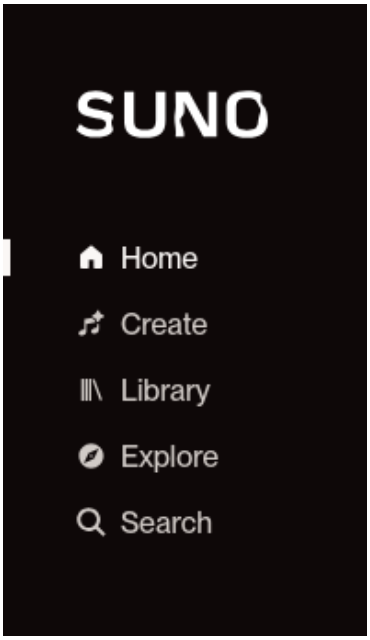

Figure 1.17: Main menu of Suno

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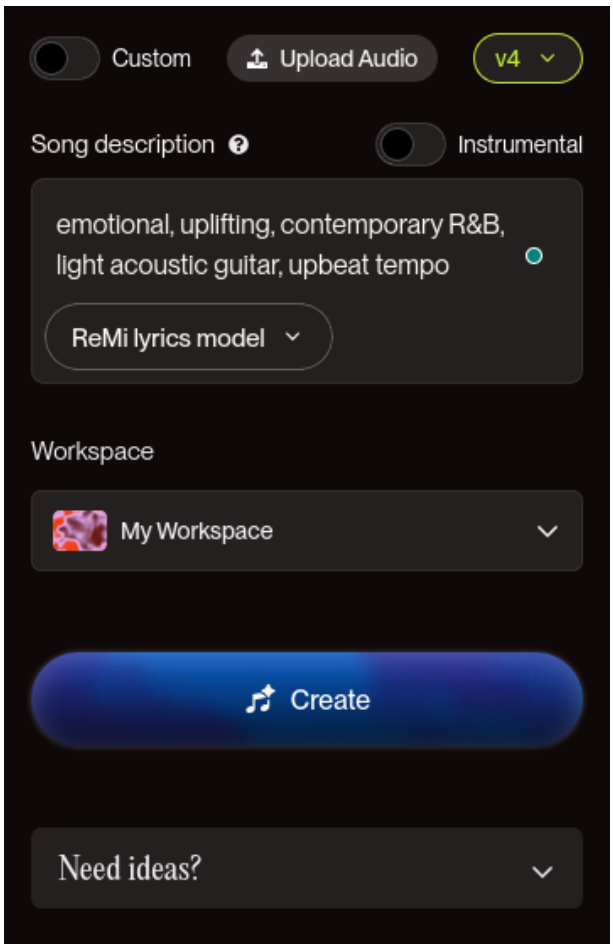

Figure 1.18: Prompt input area offers more features than only a prompt input box

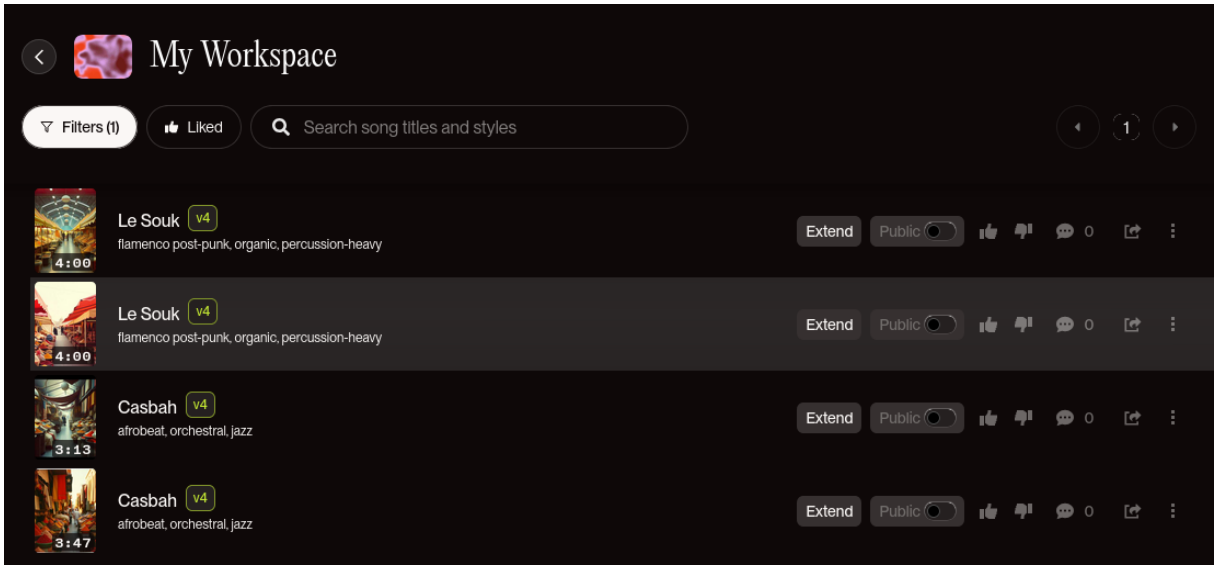

Figure 1.19: The generated music, two songs per prompt

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invideo AI

invideo AI is a video creation tool that uses artificial intelligence models to help users produce polished, engaging videos from simple text or media inputs. Its advanced algorithms allow it to automate tasks like selecting the right one, adding and precisely placing background music, and rendering captions. Educators can use it to quickly transform lecture notes, slides, or reading material into visually appealing video content. This tool includes numerous readily available templates, so even those new to video editing can achieve professional-looking results. With invideo AI, uploading textual or graphical content, picking a theme, and letting the system handle the rest is possible. The bundled AI searches for suitable stock footage or generates media content align music transitions and suggests on-screen text to highlight key points. This approach speeds up production and ensures the output is high quality. Students also benefit from watching concise videos based on complex topics. Finally, invideo AI streamlines the video production process, freeing time to focus on teaching rather than technical editing.

Use Case Examples

Transforming Lecture Slides into Video Reviews

Sometimes, students struggle with bulky slide decks before exams. Instructors can use invideo AI to turn their lecture slides into short videos that summarise essential points of the relevant class materials. For example, a history professor can take their slides on the French Revolution and provide invideo AI with the main bullet points. The platform's AI recommends relevant background images or short video clips, such as depictions of historical sites, or generates them. Afterwards, it arranges the content into a story-like format. Captions and highlights have been added to help draw attention to key dates and figures. The result is a concise clip of a predefined duration that students can watch at leisure. Embedded narration can reinforce the message or correct any misconceptions or mispronunciations in a foreign language learning context. Because the videos are short, learners stay engaged without feeling overwhelmed. Educators can post such videos on a course website, making them readily accessible to students. This approach can be used to render learning materials in a way that is appealing to visual and auditory learners. It can also be considered a timesaver for professors who do not have to create videos or record extensive voiceovers manually. Giving the AI a simple outline allows this tool to render a shareable video review in moments. Students appreciate the more enticing and concise format, which can sometimes help boost retention and understanding of complex material.

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Student-Produced Marketing Ad for a Case Study Competition

Students in a marketing course often struggle to create eye-catching ads for their case study projects. With invideo AI, they can transform research findings and campaign concepts into a polished promotional video. If the task is to boost awareness for a startup's new eco-friendly product, the students may collect product images, brand guidelines, and key statistics about sustainability benefits, upload these materials into invideo AI, and the outcome will be an appealing sequence of multimedia elements, matching text captions to the main points of the video, such as '100% Recyclable' or 'Zero Carbon Footprint.'

If the desired outcome is described as containing a vibrant theme and an upbeat music track, the generated content might successfully grab viewers' attention. Students can also add a brief voiceover that explains their product's unique selling proposition in simple terms. Should only a short clip be what this group of students needs, it is possible to use this tool towards such an outcome as well. Once the final video is ready, it can be exported in a high-definition format. The finalised ad can then be shown during the case study presentation or posted on social media to reach a broader audience. By streamlining and simplifying editing tasks and the complex process of creating a simple video, invideo AI helps students focus on strategic messaging and persuasive storytelling.

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Step-by-Step Example

The following steps are based on the first example presented above.

1. Go to the invideo AI website (https://ai.invideo.io) and create an account or use your existing credentials to log in. Fig. 1.20
2. Input your lecture notes into the prompt textbox. Fig. 1.21
3. The AI will break down the notes into segments and assign matching images or clips.
4. Check each scene's text to ensure accuracy and highlight essential terms or dates.
5. Watch the draft to confirm the visuals and the content align with your lecture content.
6. Adjust scene length, background music, or transitions using the built-in editing tools.
7. Choose a resolution, e.g. HD, and download your file.
8. Upload to your learning platform or email the link so everyone can watch it.

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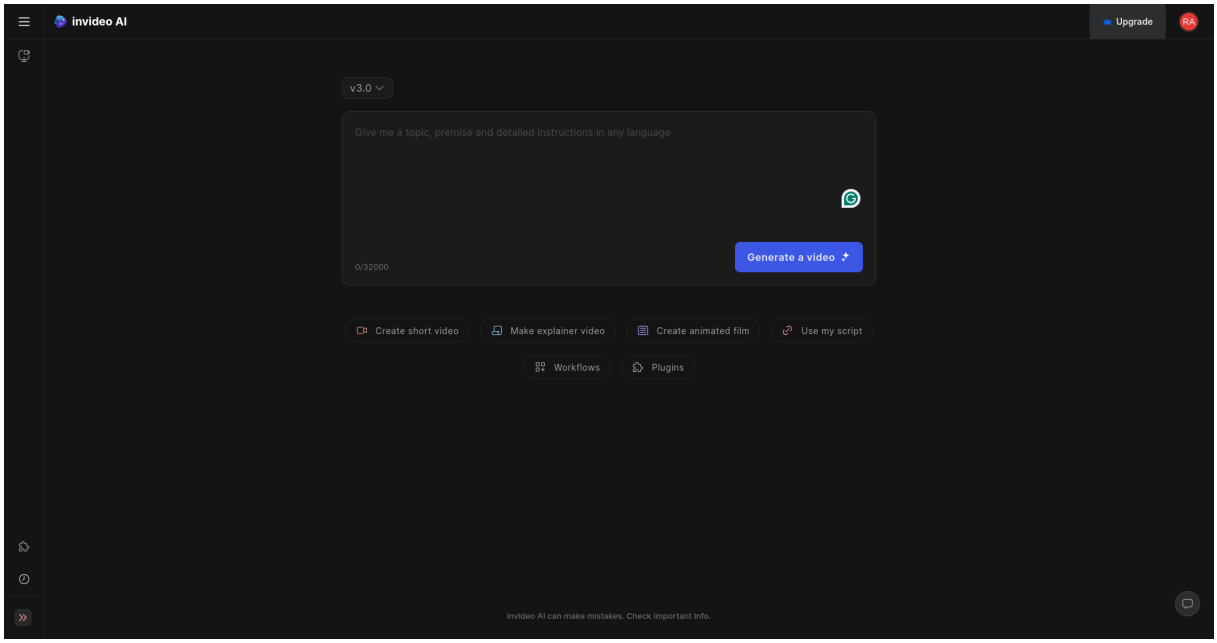

Figure 1.20: Official website of invideo AI

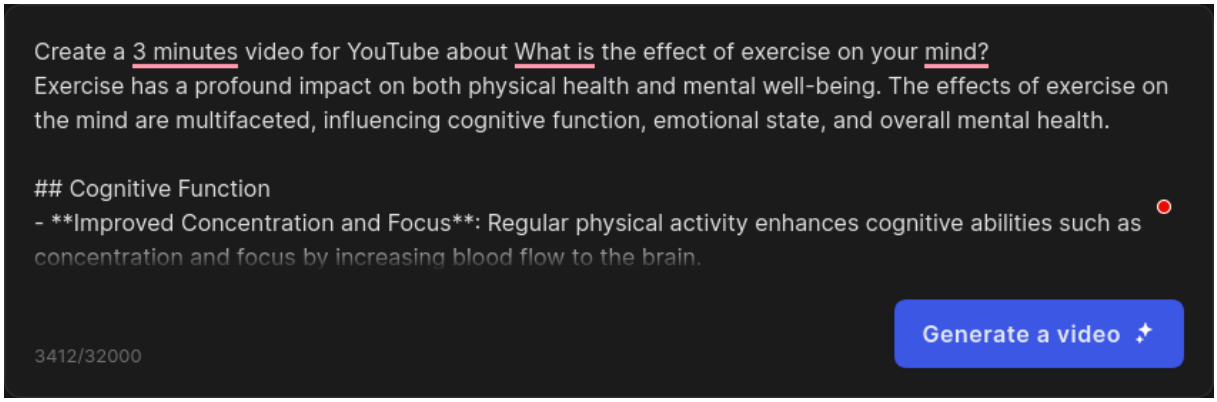

Figure 1.21: Writing a prompt at invideo AI

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