AI in Studies

Tips on Technology and Law for use at LUH

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This handbook is intended to regulate, contextualise, inform, orientate and inspire students with regard to the use of AI systems during their studies at LUH. Based on the Teaching Constitution, the guiding principle is that students should be able to develop both professionally and personally and be prepared for the professional world. AI skills also contribute to this. The three premises of this handout are: The use of AI tools in a university context is regarded as a future skill. Reflecting on the sustainability of the use of text-generating AI tools and a fundamentally critical mindset with regard to the output of AI-generated content are key aspects. **The use of AI tools is seen as a support during studies and does not replace the student's own intellectual performance.** It is the students' own responsibility to ensure the lawful, responsible and transparent use or non-use of AI tools.

Further useful information: https://www.uni-hannover.de/en/studium/lehre/planung-und-gestaltung/ki

Question overview:

1 What are AI tools?

Firstly, the abbreviation AI: Artificial intelligence (AI) refers - in simple terms - to automated processes and technologies for efficiently solving complex problems that at least appear to require human intelligence. In technical terms, this means that AI represents rule-based and statistical knowledge. This has been coded by experts or trained from often enormous amounts of data. The latter is known as machine learning.

The represented knowledge is used in automated processes to make decisions, calculate values, generate or change data and much more based on given input data. These processes are implemented in software technologies that can be used by people as a tool for their own input data. In this guide, we refer to such software technologies in particular as AI tools.

Recently, AI tools that use so-called Large Language Models (LLMs) and other generative AI methods have become particularly widespread. They can solve tasks based on textual input (often called prompts), create or optimise new texts, analyse or evaluate existing texts and generate images or even videos and audio. Well-known examples include ChatGPT, Microsoft Copilot, Google Gemini, Github Copilot, Dall-e, Stable Diffusion and Midjourney. New AI tools are added on a regular basis, making it almost impossible to provide a complete list. In addition, existing AI tools are constantly being developed further.

However, even before generative AI processes emerged, there were already many software tools that used AI processes for at least part of their tasks, sometimes without the users realising it. These include search engines such as Google, Bing or DuckDuckGo, answer engines such as Wolfram Alpha, translation programmes such as DeepL and Google Translate and correction programmes such as Grammarly or the correction functions of Microsoft Office.

Conversely, not every software tool that can be used to create, optimise and evaluate texts, images and similar information necessarily uses AI processes. This is because many of these functions can also be implemented using "classic" mathematics and computer-based processes, known as algorithms. These determine a suitable output for an input along a path specified by experts.

Ultimately, it is often not easy for people using a tool to recognise whether it uses traditional or AI-based methods. For the sake of simplicity, we therefore refer to all such software tools as AI tools in this guide.

In this guide, we refer to text-generating AI tools. You can read more about examples of this and other areas where AI tools are used on the website (https://www.tib.eu/en/learning-working/schreibbar).

2 How does it actually work? Technical basics

What technical principles make the diverse results of AI tools possible? Storing and processing knowledge, making decisions based on patterns in large amounts of data, generating new data, texts and images - does it all work the same? Not quite. Due to their extensive use in AI tools such as ChatGPT, we will limit ourselves to the basic functionality of the above-mentioned Large Language Models (LLMs) as an example.

2.1 What is an LLM?

An LLM is an AI process that is used to generate an output text for a given input text (the prompt). This means that an LLM does not find answers or solutions on the Internet, as search engines do, and it does not copy texts from other sources, but creates new texts for each prompt. Today's LLMs are often designed in such a way that they understand the prompt as a question or instruction and respond accordingly.

2.2 How does the generation work?

LLMs such as ChatGPT have learnt independently from billions of texts which words can best be written in a given context. If you now enter the prompt as input, an LLM can calculate which word is most likely to come after the input - and so it continues word by word. The LLM takes into account not only the immediate context of the most recently added words, but also the entire text history.

2.3 Why do the generated texts often make sense?

When processing the billions of texts, an LLM implicitly memorises the knowledge contained in the texts and links knowledge with each other - implicitly because the knowledge is stored independently of its concrete formulation. When the prompt is entered, all knowledge that matches the content of the prompt is automatically used. In addition, example dialogues were used to demonstrate what a response to a prompt should look like.

2.4 To what extent can the generated texts be trusted?

Especially with common content, the information contained in the generated texts is often correct, but you should never trust it: LLMs do not check the correctness of their own texts, in particular LLMs have no concept of "truth". By generating information word by word, they may also invent information, which happens more frequently, especially with more sophisticated content. In addition, they reflect all the representations and views of the world that are found in the processed texts, even if these reflect half-truths, prejudices and outdated world views. These biases are not always easy to recognise.

3 Which legal points are important?

Students and teachers alike want clarity about what is and is not permitted. Would you like a somewhat simplified "catalogue" with yes/no answers? From a legal perspective, however, this is not possible here and the answer to "What is allowed and what is not?" can usually only be worked out on a case-by-case basis. This cannot be the aim of a handout and some regulations are governed by higher legal levels such as laws and ordinances, while others can be decided in the institute right down to the course and the respective course unit. This is because it can be important to first have your own expertise in specialised content and methods in order to be able to evaluate the results of AI tools on this basis in the first place.

For this reason, there is also a guide on the legal aspects of using AI tools in teaching and learning. This includes topics such as copyright and deception. At this point, we would like to point out questions that should be clarified in the context of specific courses.

3.1 What do I ask my lecturers?

In principle, your work must be an independent achievement. If you want to use a tool, clarify a few questions in advance with your lecturers, such as the following examples. New AI tool functions may give rise to new questions at any time.

- What rules apply to the course? Is the use of AI tools permitted?
- Are certain tasks excluded?
- For which application scenarios are AI tools permitted?
- What applies when creating coursework and assessments?
- Can I have texts generated and transferred?
- If it is permitted: What (and how) should be documented?

3.2 What is good to know?

- **Am I entitled to guidelines on how the use can be disclosed?**
  There is no obligation on the part of the teacher to create information sheets or guidelines. Ask about the dos and don'ts at the beginning.

- **Am I entitled to training courses?**
  There is no entitlement, but there are already good offers such as the courses offered by the TIB (https://www.tib.eu/en/learning-working/schreibbar) and the ZQS/Key Competencies (zqs.uni-hannover.de/en/sk)

- **How may my works be used?**
  Your work is protected by copyright (your work - even in part - may not be uploaded or used by third parties in an AI tool without your consent). Your texts must also be assessed individually.

- **How can I use AI tools?**
  At LUH, LUHKI and the Academic Cloud are available for this purpose. You cannot be compulsory to use a tool that requires you to disclose personal data.

3.3 What do I have to pay attention to?

As the author, you assume data controller responsibility both for the use of the AI tools and for the submitted work. Do not enter unauthorised third-party content and data for further processing. Pay attention to the terms of use of the tools themselves, as these may change and may be structured differently depending on the licence. When applying for eligibility to use the Academic Cloud, for example, you will receive information on which AI tools are legally compliant with the General Data Protection Regulation (GDPR).

The legal handout contains many important tips on what you should pay attention to when using text-generating AI tools. One particular point is unintentional plagiarism - when an AI tool outputs a text that is close to a protected text.

One more thought on power and water consumption. The IT infrastructure and computing requirements for AI tools are significantly higher than for pure internet search engines. Develop a critical awareness of when you use which tool for your tasks.

3.4 What is not possible?

Just as the Teaching Constitution emphasises that students should develop their personalities, it also applies to students that they should work in an academically correct manner. This follows a code to research and publish transparently and according to agreed rules. Practising this is the goal of many study and assessment programmes. Those who do not adhere to it damage their own reputation.

Three times NOT:

- Don't conceal when and how you use AI tools. Find out whether the use of AI tools is permitted and document what you are doing with which tool.
- Do not violate the rights of other people, e.g. by entering third-party data without authorisation. This also includes the unauthorised upload of lecture material etc. if this is used by the provider for further training of the AI.
- Do not use the AI tools to create fakes (plagiarism) or to cause harm to others (deep fakes).

4   Do these guidelines apply to everyone?

Depending on the discipline or specialism, these guidelines may be supplemented or restricted. Our advice is therefore to discuss technologies with your teachers before using them for study or assessment purposes!

5   Who compiled the guidelines?

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