Guidelines for the use of generative AI in teaching at the KIT Faculty of Computer Science (AI Guidelines for Computer Science)

1. Preamble

These guidelines are aimed at both students and instructors of the KIT Faculty of Informatics, with the exception of interdisciplinary theses and the courses of the Institute for Information and Business Law (IIWR). These guidelines focus on recommendations for the use of generative AI in student work, including text, code and other artefacts, and provides advice on how instructors can guide their students in this endeavour.

This document assumes a basic familiarity with generative AI, large language models (such as GPT) and AI assistants based on them (such as ChatGPT). For background information, we recommend the guide by Gimpel et al, 2023 [Gimpel2023] and the guide by the University of Mannheim [ZILL2023].

Generative AI is a new technology that can improve productivity. However, its impact on the learning process is not yet well understood. Depending on the learning objectives, the use of generative AI can be counterproductive or useful in achieving these objectives. Accordingly, these guidelines reflect the learning objectives of the different courses and the competencies to be acquired by the students.

Students and instructors should be aware of the typical problems and pitfalls of generative AI in all the application scenarios described below. The guide from the University of Mannheim [ZILL2023] provides an excellent overview of problems and pitfalls, organised by application scenarios.

If students decide to use generative AI, it is their responsibility to familiarise themselves with the potential problems and pitfalls described in [Gimpel2023] and [ZILL2023]. One example is the problem that generative AI could literally copy content from copyrighted or otherwise protected material (see [Gimpel2023], p. 25 and p.35). Users of generative AI are responsible for checking their results for such infringements, for example, by conducting a web search.

We believe that critical reflection is crucial for the effective and responsible use of generative AI in teaching and learning activities. Therefore, all activities that allow students to use generative AI should address reflection on challenges and opportunities in a given scenario and encourage students to appraise the implications of their reliance on AI critically.

In all cases, students remain responsible for their work. This also applies to the parts of their work that have been created using or influenced by AI. This implies that students are expected to critically appraise contributions by AI, that they are expected to fully explain such elements within their code or written text, and that they acknowledge and make transparent which portions of their work were generated or informed by AI.

2. General information

2.1 Use of generative AI in studying and teaching

(1) The use of generative AI in student work is permitted as long as it does not contradict the learning objectives of the respective course. This is explained in the second part of these guidelines for selected forms of examination. These guidelines do not restrict the use of AI for learning purposes.

(2) Depending on the learning objectives of specific courses, instructors may deviate from these guidelines and formulate other regulations.

(3) Instructors shall provide information in courses about the regulations resulting from these guidelines and about any deviations. This information shall be provided in the introduction to the course and in writing. If such information is not provided, these guidelines shall remain unaffected.

(4) The use of systems for checking or correcting the spelling, grammar and style of a text, as well as systems for language translation, is generally permitted.

(5) Students must inform themselves about the regulations applicable to the respective course before using generative AI. In courses with individual supervision (e.g. seminars, internships and final theses), the interpretation of the regulations must be agreed with the supervisors.

(6) If these guidelines do not permit the use of generative AI for an application, the use of generative AI may correspond to the use of an unauthorised aid in accordance with Section 11 (1) SPO [SPO Informatik].

(7) If the use of generative AI is permitted but not required as part of a course, it must be possible to solve tasks without the use of generative AI within the specified time.

(8) Courses that require the use of generative AI by students shall indicate this requirement in the module handbook. Instructors provide the technologies required for a course if they are not publicly available.

2.2 Responsibility and documentation

(1) Students are also responsible for those parts of their work that were created with the help of AI or influenced by it.

(2) Students must be able to fully explain elements created or influenced by AI (with the exception of spelling, grammar and style correction results).

(3) The use of generative AI must be indicated in the work by stating the purpose for which AI was used, which parts of the work were generated or influenced by AI and which models were used.

(4) The use of systems for checking or correcting the spelling, grammar and style of a text, as well as systems for language translation, does not have to be documented.

(5) If the students' submission leads the responsible instructors to assume that generative AI was used in an inappropriate manner to create the artefacts, the students may be asked to explain their artefact in an additional oral session. This will take place no later than three weeks after the

artefacts have been assessed. This session will only check whether and to what extent AI assistants have been used without permission. If such use is determined, the grade of the affected parts of the student's work may be reduced or a violation of Section 11 (1) SPO [SPO Informatics] may be determined.

(6) The options for documenting the use of generative AI must be differentiated according to the type of artefact.

(a) For artefacts in text form, such as seminar papers and theses, it is advisable to identify the use with a section entitled "Tools used". The used system, (language) model and, if available, prompt engineering techniques should be recorded there. In individual cases, it may be advisable to list queries and results. For final theses, students should discuss with their supervisors which form of documentation is appropriate. Such a section could include, for example,

> *ChatGPT with GPT 4 and "Advanced Data Analysis" was used to generate code for analysing the measurements.*

(b) For artefacts in code form, for example, implementations of project or final theses, it is advisable to create a corresponding section in the project's readme file. Such a section could contain, for example,

> *GitHub Copilot was used to implement the Tableau algorithm.*

3. Application

3.1 Proseminars and seminars

(1) The qualification objectives of the proseminar are defined in the module handbook for the B.Sc. in Computer Science [Modulhandbuch Informatik B.Sc.] These are

1. Students can deal scientifically with fundamental topics in computer science (in a specific subject area).
2. Students can apply the steps from simple literature research to the preparation of results in written and oral form.
3. Students are able to analyse and abstract information and communicate fundamental principles and relationships in a concise form.
4. Students can present scientific results orally and in writing.
5. Students are familiar with the DFG Code of Conduct "Guidelines for Safeguarding Good Scientific Practice" and successfully apply these guidelines in the preparation of their scientific work.

These steps must be carried out in accordance with 2.1.1.

(2) Students can use generative AI to increase their productivity in these tasks and receive explanations or feedback on texts.

(3) Generative AI can support students in this work, but cannot replace their independent work. This means that AI can be used as a "sparring partner" that supports the students, but not as a "ghostwriter" that replaces the students.

(4) It is therefore permissible within the framework of the proseminar

1. to use generative AI to better understand and obtain explanations of a topic covered in the literature,
2. to use generative AI for spelling, grammar and style corrections (see 2.1.4) or
3. to use generative AI to receive feedback on texts or an outline.

(5) It is not permitted within the framework of the proseminar

1. to use generative AI to generate an outline or thematic focus with little or no student input (see 2.1.1 in conjunction with Objectives 3 and 4),
2. to use generative AI to formulate entire paragraphs or sections (cf. 2.1.1 in conjunction with Objective 4),
3. to have generative AI create summaries of articles without reading these articles themselves (cf. 2.1.1 in conjunction with Objective 3) or
4. to use generative AI to identify relevant works on a topic without first carrying out a keyword search in bibliographic databases (cf. 2.1.1 in conjunction with Objective 2).

(6) These regulations apply accordingly to seminars. If these regulations do not match the learning goals of a given seminar, instructors can deviate from these regulations.

(7) Instructors are advised to place greater emphasis on the discussion of the work in the final oral presentation when grading and to ask questions that check whether the students have correctly understood the ideas presented.

3.2 Final theses

(1) The qualification objectives of the final thesis are defined by the study and examination regulations [SPO Informatik]. They state:

> "The [final thesis] should show that the students are able to work on a problem from their field of study independently and within a limited period of time using scientific methods."

(2) What appropriate scientific methods in computer science are is mainly discussed within professional societies, such as the Association of Computing Machinery [ACM2023] (the most important international professional society for computer science). This guideline is therefore based on the newly revised ACM guidelines on authorship and the DFG statement on the use of generative AI in science [DFG2023].

(3) Accordingly, students may use AI assistants for most final theses but must document their use so that their supervisors and assessors can evaluate the student's own contribution and

determine whether this contribution actually demonstrates the student's ability to work on a problem independently using scientific methods.

(4) The use of generative AI should, therefore, be discussed in advance with the instructors in order to decide whether the planned use of generative AI is advisable and in what form the labelling should take place in accordance with 2.2.3. For example, the creation of code to analyse measurements is generally advisable. As another extreme example, the complete generation of a core chapter of the thesis is usually not advisable, as there is little own contribution left to demonstrate the above-mentioned capability.

(5) Different forms of documentation are appropriate depending on the topic of the thesis. Students should, therefore, ask their supervisors how they should document the use of generative AI in their thesis. Suggestions can be found in section 2.2.6(a).

(6) When assessing the final thesis, supervisors and assessors examine the student's own contribution in order to assess their ability to solve problems independently using scientific methods. Accordingly, the use of generative AI and its documentation is taken into account in the assessment of the thesis.

3.3 Exercises as part of events

(1) Exercises within the framework of courses prepare students for an examination in which the competencies to be acquired are determined. They, therefore, serve the independent learning and practising of these competencies.

(2) Students should, therefore, complete exercises without the use of generative AI unless otherwise stated.

3.4 Practice of Software Development (PSE) and Team Project Software Development (TSE)

(1) The qualification objectives of the module "Practice of Software Development" (hereinafter PSE) are defined in the module handbook of the B. Sc. in Computer Science [Modulhandbuch Informatik B.Sc.] It states:

> *"Students learn to carry out a complete software project in teams of 4-6 participants according to the state of the art in software engineering."*

The qualification objectives of the module "Team Project Software Development" (hereinafter TSE) are defined in the module handbook of the B. Sc. in Business Information Systems [Modulhandbuch Wirtschaftsinformatik B.Sc.] These are comparable with the qualification objectives of PSE.

(2) Within the framework of PSE and TSE in research groups of the KIT Faculty of Informatics, the use of generative AI is permitted, as it corresponds to the state of the art in software technology. The use must be documented in accordance with 2.2.3.

3.5 Labs

(1)Labs (Praktika) usually have more specific learning objectives than learning programming. Therefore, students can usually use generative AI to become more productive if they wish and if

it corresponds to the skills and competences they wish to acquire. Documentation of use according to 2.2.3 must be provided.

(2) Supervisors and examiners will assess the student's own contribution at the end. Students should therefore consult with their supervisors before using AI assistants to create key aspects of their solution.

Literature

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