



Generative AI at FSE

Vision document

Introduction¹

Developments in AI systems are moving at a fast pace. AI-driven tools are presenting unprecedented opportunities and challenges in different sectors including scientific research and education.

For *scientific research*, AI applications range from discipline-specific AI systems that facilitate statistical analysis, simulating chemical reactions on data-driven AI systems, to generic AI tools that can support literature review and synthesis.

For *education*, AI applications include but are not limited to grading and assessment, design of interactive activities, translating educational materials and fostering interactive and adaptive learning environments.

These possible applications are especially important in Science and Engineering education. On one hand, it is important to support students to develop an understanding of how AI tools can be used in scientific research. On the other hand, it is important that lecturers develop an understanding of how AI tools can be utilised in teaching and learning.

In addition to the 10 basic rules to integrate responsible and competent use of generative AI (genAI)² suggested by the University of Groningen [[UG AI policy](#)], at FSE we take a closer look into the possibilities and challenges posed through AI developments with an education vision that prioritises **critical AI literacy**.

We aim to provide a coherent and research-informed framework that also provides room for disciplinary differences between programmes and courses. Hence, this vision document aims to facilitate programme boards and course coordinators on their duties and decision-making in course and curriculum design.

Vision

FSE's mission is to '(i) excel in education and research in a broad range of disciplines in science and engineering, (ii) promote innovation and have an impact in society, and (iii) challenge and support students and staff to identify and develop their academic, professional, and personal

¹ This is a dynamic document, which will be adapted to the (anticipated) developments in the world of AI in the coming years.

² Software applications or platforms that are designed to create original content (text, code, images, music, etc.) by analysing and learning from vast datasets.

talents.’ [[FSE strategic plan](#)]. Any efforts regarding the use of genAI at FSE should be aligned with these FSE goals.

In the coming years, FSE will foster a **critical embrace of genAI** tools that goes beyond the blind exploration of opportunities and includes an understanding of limitations as well as risks associated with AI tools. FSE aims to promote *critical AI literacy* for our students and staff.

Towards critical AI literacy at FSE

Situated within global policy recommendations, we view the university’s role as one of serving as a springboard to empower its community to place *AI at the service of human development*.

FSE fosters responsible use of genAI tools that acknowledges both opportunities as well as risks and ethical considerations. Critical AI literacy is defined as *the set of competences and dispositions that enable students and instructors to evaluate, communicate and collaborate with AI technologies critically and responsibly in Science and Engineering contexts*.

We maintain that our students should develop both a general AI literacy that includes an understanding of application of AI tools in everyday life alongside ethics, biases, and risks as well as a discipline-specific AI literacy, which encompasses a range of discipline-specific AI models. This definition acknowledges the need for a competent use of current disciplinary content that is not only used in professional and academic situations but is also applied in everyday life.

This definition is operationalised as:

- Developing technical knowledge on genAI systems that allows understanding on how data is processed and retrieved. This knowledge should not be dependent on extensive knowledge of coding skills or mathematics.
- Evaluating the impact of AI systems in academic activities balancing its strengths and dangers at different levels:
 - a. Impact on the ways of performing scientific research and educational activities (accountability, need of new protocols and tasks, establishing clear roles etc.).
 - b. Impact of using AI tools with their specific architecture and training dataset (biases, output limitations, etc),
 - c. Impact of collaborating with specific AI providers (data protection, values of the provider, accountability of the provider).
 - d. Impact on human interactions (which new dynamics will be fostered, student-teacher interactions)
 - e. Impact on social, political, economic and cultural spheres (which practises as an institution we want to reinforce or prevent).

From an educational perspective, the focus should be kept on the need for teaching activities that are responsive to current insights from Science and Engineering Education. Thus, AI literacy cannot be achieved without active forms of learning that centres on intentional instructional design and utilisation of students’ prior experiences and views in relation to AI.

Values

To convey a responsible use of genAI tools, preserving *safety* and *academic integrity* is used as a premise to guide decision making. In the context of genAI, safety entails the ability of AI systems to operate without causing harm to people, property, or the environment. Academic integrity entails a set of attitudes that lead to good academic practices.

This premise implies the following considerations on the specific values of fairness, accountability, transparency, and ethics.

- **Fairness.** We understand fairness as the set of situations, practices and cultures that attempt to mitigate biases. Ensuring fair practices imply a focus on the datasets and the algorithmic processes that have the potential to discriminate against individuals or minority groups based on specific attributes. FSE students should be aware that genAI tools can reproduce prejudice and unfairness consciously or unconsciously.
- **Accountability.** We understand accountability as the responsibility held by a subject for their actions. While FSE members carry full responsibility for their actions and work, the use of genAI tools demands efforts to determine shared accountabilities. This implies the need for reciprocal understanding of genAI tools and the activities of the FSE community that warrants the distribution of responsibilities.
- **Transparency.** We understand transparency on genAI tools as the ability to explain itself and how it processes and retrieves information. GenAI tools should allow students to be in control of their data and make informed choices about how their data is used. Students should also be explicit about the usage, and credit of the genAI tools. FSE members will also have to address the tension between accuracy and transparency of genAI tools and demand explainable models that support transparency.
- **Critical & Ethical use.** We understand critical and ethical use of AI systems as the set of skills and dispositions that enable subjects to discern and reflect upon ethical issues around the emergence of AI systems in education. FSE members are expected to keep an informed and critical utilisation of the outputs generated by genAI and require spaces for further critical questioning of genAI tools in their fields.

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