Miten tekoälyä voidaan hyödyntää vastuullisesti (yrityksissä)?

TkT, FT, Marja Matinmikko-Blue, tutkimusjohtaja, Infotech, Oulun yliopisto

Background

- The use of AI in the different phases of research is widespread but varies a lot between researchers. Transition phase is still on-going.
- Generative AI in particular has made different skills widely available (e.g, creating text, figures, surveys, software). The new skill needed is to give instructions to AI.
- Tools are progressing rapidly, and new tools appear. Forerunners adopt new ways of working and can benefit in the transition.
- At the same time, traditional know-how is not always respected when the AI tool is easily available to answer questions.

Status in Finland and Europe

- Finnish National Board on Research Integrity (Tutkimuseettinen neuvottelukuna TENK) has established the Finnish Code of Conduct for Research Integrity* (hyvä tieteellinen käytäntö), where the basic principles are **reliability, honesty, respect and accountability (luotettavuus, rehellisyys, arvostus ja vastuunkanto)**. Researchers in Finland need to follow these guidelines. They do not consider AI specifically.
- TENK has started the work on AI by establishing a working group that in June 2025 to develop guidelines for AI.
- The EU has established living guidelines on the responsible use of generative AI in research**, including reliabiity, honesty, respect and accountability.
- Many organisations have their own guidelines for responsbile use of generative AI with different level of detail.

*Tutkimuseettinen neuvottelukunta https://tenk.fi/sites/default/files/2023-11/RI_Guidelines_2023.pdf

** https://research-and-innovation.ec.europa.eu/document/2b6cf7e5-36ac-41cb-aab5-0d32050143dc_en

Starting points in research

Tutkimuseettisen neuvottelukunnan Hyvä tieteellinen käytäntö.

Key principles

Reliability in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.

Luotettavuus

Honesty in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.

Rehellisyys

Respect for colleagues, research participants, society, ecosystems, cultural heritage and the environment.

Arvostus

Accountability for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts.

Vastuunkanto

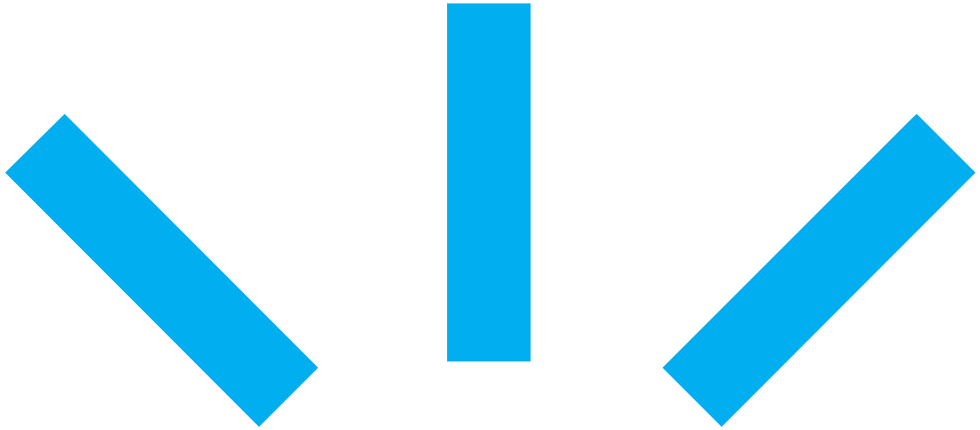
Starting points

European Commission Directorate-General for Research and Innovation

https://research-and-innovation.ec.europa.eu/document/download/2b6cf7e5-36ac-41cb-aab5-0d32050143dc_en?filename=ec_rtd_ai-guidelines.pdf

Key principles

- **Reliability** in ensuring the quality of research, reflected in the design, methodology, analysis and use of resources. This includes aspects related to verifying and reproducing the information produced by the AI for research. It also involves being aware of possible equality and non-discrimination issues in relation to bias and inaccuracies. Luotettavuus
- **Honesty** in developing, carrying out, reviewing, reporting and communicating on research transparently, fairly, thoroughly and impartially. This principle includes disclosing that generative AI has been used. Rehellisyys
- **Respect** for colleagues, research participants, research subjects, society, ecosystems, cultural heritage and the environment. Arvostus Responsible use of generative AI should consider the limitations of the technology, its environmental impact16 and its societal effects (bias, diversity, non-discrimination, fairness and prevention of harm). This includes the proper management of information, respect for privacy, confidentiality and intellectual property rights, and proper citation.
- **Accountability** for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider societal impacts. This includes responsibility for all output a researcher produces, underpinned by the notion of human agency and oversight Vastuunkanto



University of Oulu guidelines for the use of GenAI in research

Overall principles

- Guidelines are confined to the **use of GenAI in research** and do not consider other types of AI or its development.
- The University of Oulu **encourages its researchers to use GenAI in a responsible way**.
- Other stakeholders (e.g., **funding agencies, publishers**) **can have more specific and otherwise controlled guidelines that also need to be followed**.
- Guidelines are based on the four principles: reliability, honesty, respect, and accountability.

Principles of research integrity (1/2)

In the context of GenAI, as defined by us:

Reliability refers to the ability to reproduce research results in different studies using the same settings and methods. More broadly, it entails ensuring the quality and accuracy of research in all phases, including design, methodology, data collection, analysis, and the dissemination of results.

In relation to GenAI, reliability means verifying and reproducing the information produced by GenAI and being aware of biases and inaccuracies.

Honesty involves conducting research in a transparent, fair, comprehensive, and unbiased manner.

In the context of GenAI, honesty means clearly labelling AI-generated content, highlighting uncertainties rather than presenting guesses as facts, and ensuring users can trace how content was created—including the data sources and prompts used. Any biases or limitations of the tools should also be disclosed.

Principles of research integrity (2/2)

In the context of GenAI, as defined by us:

Respect is about giving appropriate consideration to all relevant matters and allowing this recognition to guide one's conduct. It means following established norms and guidelines, and acknowledging the intrinsic value of others, material entities, and immaterial entities, rather than viewing them solely instrumentally.

In the context of GenAI in research, respect means considering colleagues, research participants, research subjects, society, ecosystems, cultural heritage, and the environment at all phases of research.

Accountability means taking responsibility for one's actions and their consequences, along with the obligation to justify one's conduct to stakeholders. Individuals and organisations involved in research are accountable for its broader impacts and should strive to anticipate and minimise any negative effects.

In the context of GenAI, this includes considering any harm that the use of selected AI tools may cause. It also means ensuring human agency and oversight, as well as transparency, which are essential for proper accountability.

Generic guidelines (1/4)

- **Use GenAI where appropriate**. Allow it to support, not replace, your expertise—especially in tasks such as literature scoping, data simulation, or language editing.
- **Researchers are responsible for the accuracy of content and information involved at every phase of research**, from developing ideas to making funding applications, collecting data, conducting analysis, and reporting results. Regardless of the quality or extent of GenAI's contribution, researchers remain ultimately responsible for the quality, validity, and originality of their research. Researchers must not attribute their errors to GenAI.
- **Authors are generally jointly responsible for their research output**. The ethical misconduct of even one team member can damage the credibility of the process and results for all. Researchers should openly discuss the use of GenAI from the outset of the research process, establishing common ground for its use and mitigating related risks.

Generic guidelines (2/4)

- **Compliance with ethics and regulations remains essential**. Using GenAI does not exempt researchers from adhering to ethical guidelines, intellectual property rights, data protection legislation, or institutional policies. Ensure that the use of GenAI tools complies with all applicable data protection laws, ethical standards, national legislation, and agreements.
- **Stay informed and comply with evolving national and international GenAI guidelines**. Align research practices with the university's Code of Conduct, Finnish legislation, the Finnish National Board on Research Integrity (TENK) guidelines, and the EU High-Level Expert Group on AI's ethical principles: respect for human autonomy, harm prevention, fairness, and explicability.
- **Follow other relevant organisations' rules regarding the use of GenAI.** Many organisations, including funding agencies, publication venues, and government agencies, have their own rules and recommendations for AI use—be sure to identify and observe these. For example, the use of AI in reviewing publications or evaluating research proposals is often prohibited.

Generic guidelines (3/4)

- **Understand the strengths and limitations of the GenAI tools you use.** It is crucial to be aware of the capabilities and limitations of GenAI tools. For example, many AI tools are not designed for numerical analysis and may make mistakes even with simple arithmetic. Researchers are responsible for selecting suitable tools and applying them correctly.
- **Ensure transparency by clearly documenting and disclosing when, where, and how content is generated by AI,** especially in published work or shared outputs. Always label any AI-generated text or graphical content and specify which large language model or application was used.
- **Verify the validity and appropriateness of the GenAI-generated content.** Remember that a GenAI model's output depends on its training material and the prompts provided and may reproduce or reinforce biases present in the training set or researchers' assumptions. Request sources and check that they exist and align with the generated content.

Generic guidelines (4/4)

- **Be aware of potential biases** (e.g., gender, race, culture, religion, region) in AI-generated content and revise as necessary.
- **Be aware of, minimise and prevent any harm that the use of GenAI tools may cause.** This includes environmental impacts. Choose GenAI tools that consume less energy and manage hardware sustainably—prioritise longevity, reuse, and proper e-waste disposal.
- **Exercise caution when sharing data with generative AI applications**, as such data may be used to train models, potentially exposing personal data, confidential information, intellectual property, or your own ideas and results to outsiders.
- **Model good practice.** As researchers, your use of AI sets a precedent for students and early-career researchers. Demonstrate discernment, honesty, and responsibility when using these tools.

Specific Guidelines for the Design and Planning Phase

- **Use GenAI tools for generating ideas and writing research proposals responsibly, in accordance with the funding agency's rules.** Decisions made at this phase create obligations to funders, project partners, and other stakeholders. Accountability requires being prepared to meet these obligations with transparency.
- **Be specific about how GenAI was used.** Clearly separate AI-generated material from your own reasoning, especially during hypothesis development or literature review planning. Even if GenAI gave you a good starting point, you are responsible for critically evaluating and shaping the idea. Use GenAI to assist in scoping the research question only if it aligns with research goals and does not undermine critical thinking or originality.
- **Ensure that the final intellectual contribution is your own.** Properly cite colleagues' contributions and previous literature, avoiding plagiarism when using GenAI in generating research ideas.
- **Ensure that AI methodologies represent cultural heritage accurately and sensitively and pay special attention to data bias**. Engage cultural experts and community stakeholders early to guide a respectful research design.

Specific Guidelines for Conducting and Managing Research (1/2)

- **Be aware of the strengths and limitations of GenAI software and treat its outputs with caution.** GenAI software can “hallucinate” and produce output that appears relevant but may be factually incorrect, especially when training data is inadequate.
- **Document when and how generative AI tools are used** during data processing, analysis, or coding, especially if they influence key research outcomes.
- **Do not use AI tools to automate tasks that require domain expertise or nuanced judgment without thorough human oversight.** For example, relying solely on GenAI for qualitative analysis can lead to inaccurate conclusions unless reviewed by experts.
- **Ensure any literature review using GenAI is comprehensive within its intended scope**, that selected papers are relevant to the research question, and that their contents are correctly understood and accurately represented. AI tools offer intuitive interfaces for searching information using natural language queries, but their apparent understanding may be misleading.

Specific Guidelines for Conducting and Managing Research (2/2)

- **Familiarise yourself with the basic principles of the GenAI software that you use** in research, including its main purpose, training data, and responsible use. While not every user needs to be an expert, researchers should understand the capabilities and limitations of the tools they employ.
- **AI-generated data should not be used as the sole data source for the main analysis** unless synthetic data is specifically needed (e.g., when real-world data is unavailable, impractical, or unethical to obtain). This may apply in simulation-based studies, hypothesis testing, or when developing and benchmarking algorithms.
- **Cross-validate GenAI-derived responses with other sources** where possible. The process of generating output may be complex and outputs may not always be reproducible, as GenAI tools can produce different results for similar prompts.

Specific Guidelines for Dissemination (1/2)

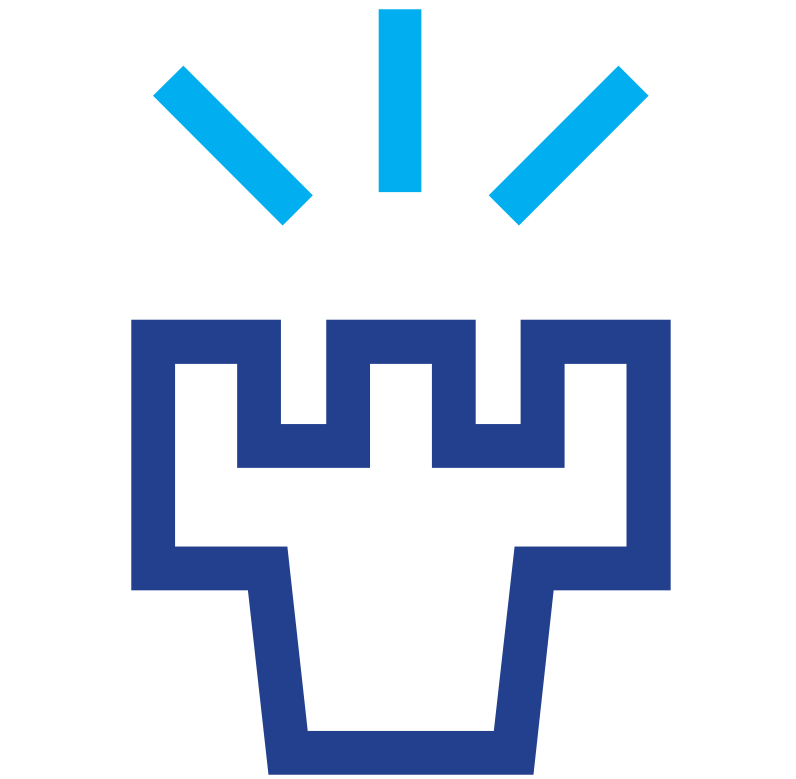
- **Ensure that results created with AI are factually correct, properly labelled, and accessible to the intended audience.**
- **Document and communicate the use of GenAI to the research audience** and acknowledge all contributors and their roles transparently. Consider disclosing the use of generative AI in writing abstracts, summaries, or presentations, especially if it contributed to the phrasing or structure, when appropriate. Clearly communicate methodologies, limitations, and ethical considerations. This can be done in the methods or declarations section of research reports, or by providing supplementary materials online if word limits apply.

Specific Guidelines for Dissemination (1/2)

- **Comply with publisher policies regarding the use of GenAI and how it should be declared.** AI tools have no agency and must not be credited as authors, even if not explicitly prohibited by publisher policy. Citing AI-generated content as a source may be justified in some cases, but such content should not be treated as authoritative.
- **Review all AI-generated language for tone, clarity, and potential bias**. Although AI-generated content may offer engaging phrases and catchy taglines for disseminating findings, it is important to ensure that these are not already in use elsewhere, are not copyrighted, and do not carry unintended slang meanings. Be mindful that AI can inadvertently introduce stereotypes or inappropriate language.
- **Exercise caution when using AI-generated media artefacts**. At present, it remains uncertain whether such creations are regarded as copyrightable works. The determination may hinge upon future case law and can differ across jurisdictions. Furthermore, it should be recognised that materials employed as training data for these tools may have been sourced without the creators' consent or compensation, which could constitute unfair and potentially unlawful exploitation of their endeavours.

Conclusions

- These guidelines give advice to researchers at University of Oulu how to use of GenAI in research in a responsible manner => The ideas are applicable to other organizations too.
- The use of GenAI changes the way we work (and do research in different disciplines). Transition phase is on-going – develop your own ways of using the new tools and exchange experiences
- Competition is fierce – dealing with conflict/misconduct situations. “Losing jobs to AI” vs. “losing jobs to people who are good at using the latest tools”.



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