

1) What is AI?

Artificial Intelligence (AI) is a term that's used a lot, and often incorrectly.

A good starting definition would be a **computer system that can simulate aspects of thinking and perform specific tasks.**

A lot of sophisticated technology is marketed as AI, but it doesn't really think like humans, it just looks like it does.

2) What kind of thinking does AI do?

When humans think, they apply many skills, such as reasoning and creating, to do countless things.

Right now, an AI system can simulate some thinking skills to do some things. The kinds of skills are specific to what needs to be done. This is called **Narrow AI**.

3) Will AI ever think like humans?

Some people are trying to develop AI that will think like a human, or even go beyond a human's ability to think. It's not clear how feasible this is, but the Narrow AI that we currently have isn't thinking.

4) Should I be scared of AI?

Narrow AI can be an amazing tool, but it's not always right. It requires human oversight and correction. The people using AI in impactful ways also require oversight.

Narrow AI isn't scary, but its misuse by people is cause for concern.

As for AI that thinks like a human (or beyond), that can be hopeful or scary, depending on the movies you've watched.

5) What is GenAI?

Generative AI (GenAI) is a system that generates content requested by a user. ChatGPT is one example - it was the first released to the public in late 2022.

Depending on the GenAI system, the content could be anything from speeches to recipes to images. However, **the system needs to be trained to produce each type of content.** This requires tremendous amounts of data, which is available thanks to the Internet.

Although this is impressive, it's still Narrow AI because:

- it doesn't think like a human (not even close);
- it doesn't create, it just remixes its training data; and
- it requires people to fine-tune the system.

6) What are some good things about GenAI?

GenAI can generate and manage content quickly when you prompt with it. Need to format a spreadsheet, or plan your next road trip, or draft a cover letter for a job application? GenAI can do that.

This can save you a lot of time and produce results you likely could not get on your own, especially if you "collaborate" with the AI and ask it to refine what it's generating.

7) What are some bad things about GenAI?

GenAI always appears to be confident, even when it's wrong. If it can't handle a user's request, it will "hallucinate" a response and present it as fact. Errors can also be introduced into the system because people produce the content and tune the system, and people make mistakes.

Even a GenAI that's free to use still has its costs. It takes a *lot* of electricity to run AI systems, which taxes power grids and contributes to climate change. In addition, much of the training data taken from the Internet belongs to its creators, and they haven't been paid for its use.

8) Is it safe to use GenAI?

The computers that provide access to the AI are often in other countries, like the United States. Their privacy laws likely don't protect the information you use in your chats.

This means that you shouldn't provide GenAI with any private data, whether it's your own or anything you use at work. Always think critically about what you are sharing with GenAI and what it tells you.

9) Can GenAI write computer programs?

GenAI can write simple programs, around the level of a first- or second-year student, depending on what it's asked to do. Sometimes they work, and sometimes they don't.

Right now, most programmers save time by using GenAI to write routine "snippets" for them, not entire programs. As AI improves, it will be used for more than snippets.

10) If GenAI can write computer programs, won't programming jobs disappear?

In the last 25 years, new productivity tools and Internet resources have helped programmers work more efficiently and avoid mistakes. GenAI is another tool in the toolbox for computer scientists, albeit a wildly powerful one.

A good computer science education doesn't just teach you how to use different tools, it teaches you the fundamentals of all possible tools. That way, you can adapt to new tools and apply them to solve problems.

There will certainly be changes in the industry, but while some jobs may end, many new ones may be created, especially if it's possible to produce more powerful and complex technology.

11) How will Queen's School of Computing handle cheating with GenAI?

Using GenAI to complete an assignment is understandably tempting to a stressed student. This would be most likely in first- and second-year courses with smaller assignments.

Finding those that do cheat is also a challenge, given large class sizes and the difficulty in proving that technical work was AI-generated.

Unfortunately, good solutions to these problems are not common. Until then, professors may shift marking schemes so tests and exams are worth more and assignments are worth less.

12) How will Queen's School of Computing teach AI?

Queen's School of Computing (QSC) offers degree plans in **Artificial Intelligence** and **Cognitive Science**. We teach 9 core courses in AI and Cognitive Science, as well as 6 electives. QSC is also launching 3 AI courses open to all students, with no computer science prerequisites.

In addition, **all courses will have to determine if and how they use GenAI.** While many universities have a lot of new policy, QSC is actively working on practical applications in our classes.

Integrating GenAI into larger projects can work if you grade milestones and focus on the process instead of just the final product. This is best suited to upper-year courses with more complex material.

At QSC, all first-year and many second-year courses teach fundamentals, which are best learned by doing smaller assignments. The beneficial use of GenAI in these courses is trickier, but not impossible, and our instructors are figuring it out.

13) How quickly is AI evolving?

The rate of change can be overwhelming; these tools are evolving very rapidly. It can feel like what was an idea mere months ago can become a part of our daily lives in a matter of weeks.

That said, the core concepts behind these changes are less subject to fluctuation. QSC aims to use contemporary tools while focusing on the fundamentals that serve a lifetime.

14) Was this document created by AI?

No, this document was compiled and written by staff and faculty in QSC.

Learn more about our AI courses and programs at:

www.cs.queensu.ca