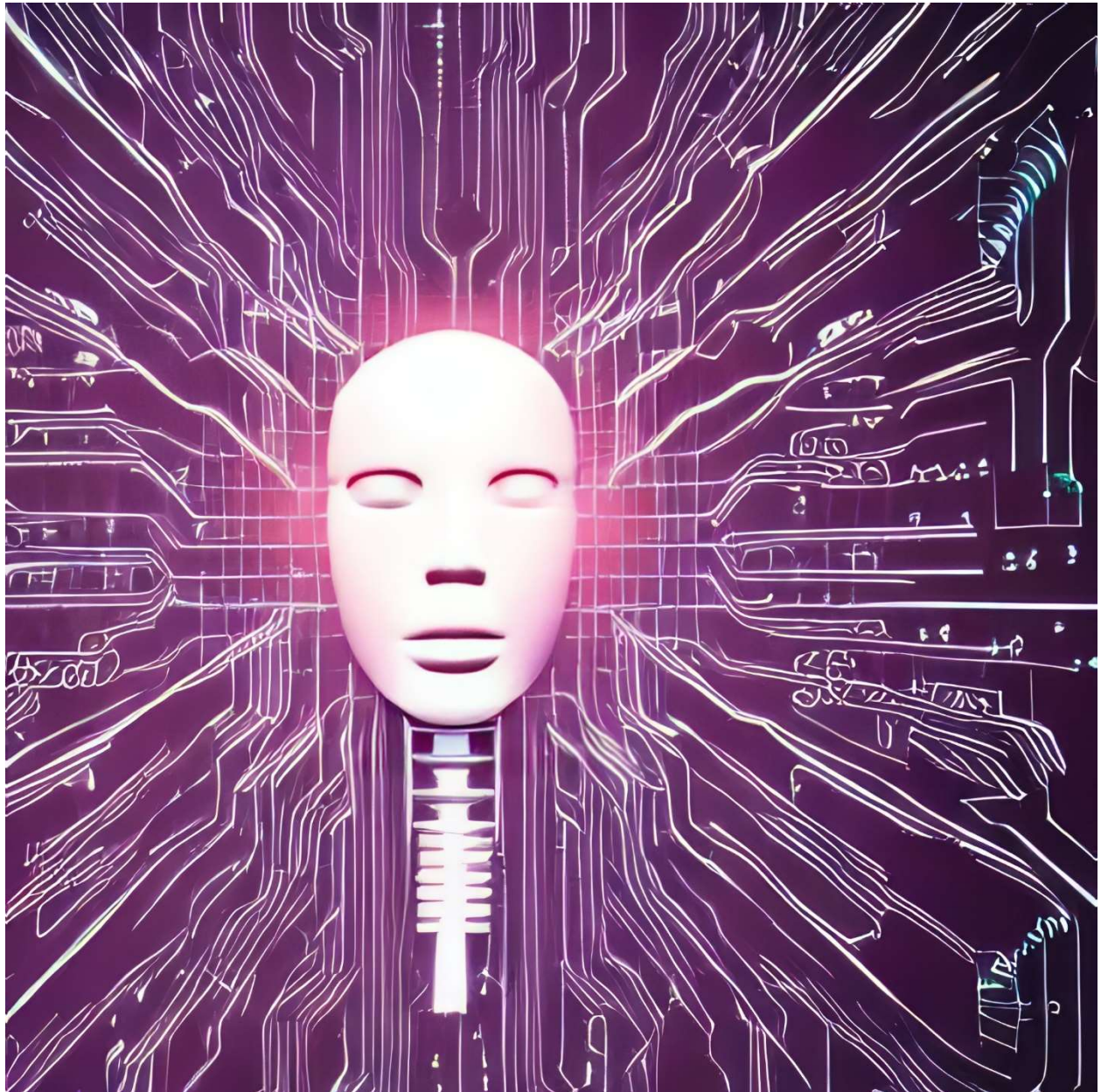# Artificial Intelligence

Science fair projects:
Ethics Policy

Artificial Intelligence Ethics Policy

What is Artificial Intelligence:

1. **Artificial Intelligence:**
   Artificial intelligence (AI) is a branch of computer science that aims to create intelligent machines capable of simulating human-like behavior and decision-making processes. It involves developing algorithms and programs that enable computers to perform tasks that typically require human intelligence, such as speech recognition, problem-solving, learning, and decision-making. AI systems are designed to analyze vast amounts of data, make predictions, and adapt to changing circumstances. Machine learning is a key component of AI, allowing machines to learn from experience and improve their performance over time without explicit programming. AI applications are pervasive in various sectors including healthcare, finance, transportation, and entertainment. Despite its potential benefits in enhancing efficiency and productivity, there are concerns surrounding the ethical implications of AI, such as privacy issues or job displacement due to automation. Nonetheless, with ongoing advancements in technology and research efforts being made by experts around the globe, the adoption and implementation of artificial intelligence continue to grow rapidly across industries. (written by AI)

2. **Machine Learning:**

Machine learning is a field of study in computer science that focuses on the development of algorithms and statistical models that allow computers to learn from and make predictions or decisions without being explicitly programmed. It leverages mathematical and statistical techniques to analyze large sets of data, detect patterns, and utilize them for making informed decisions. The core idea behind machine learning is to enable machines to continuously improve their performance based on experience. This involves training models with labeled datasets, where they learn associations between input variables and desired outputs. These trained models can then be used to predict outcomes or classify new inputs based on their learned patterns. Machine learning has various applications across industries, including speech recognition, image processing, fraud detection, recommendation systems, and autonomous vehicles among others. As advancements in technology continue to unfold, machine learning is expected to play an increasingly critical role in shaping our future. (written by AI)

QRSTF Policy

To Start:

Your privacy and safety are our top priorities. Don't share private information about yourself or that of others, such as your address, phone number, or true name, when using AI. It's preferable to communicate using pseudonyms or to stay anonymous. Never forget that your preferred AI bot is a machine learning model; it is not a friend or confidant; rather, view it as a tool devoid of feelings, motives, or personal ties.

1. the AI used in the project should be age-appropriate and not exceed the student's grade level. This ensures that the project is a reflection of the student's own capabilities and knowledge.
2. students are required to have a basic understanding of AI and its applications. This will not only help them in their project but also prepare them for the future as AI continues to advance.
3. the use of AI should not compromise the safety of the participants or the environment. Any project that poses a potential risk will not be allowed to participate in the fair. Check out our ethics page (http://qrstf.ca/ethics.html)

Citation and Verification and Logbooks

- No matter how much you trust the resource, you should always verify the information. AI is an important resource but be wary of all information that comes from it. It is important to fact-check the information from reliable sources. All remember to site your resources, purpose for using AI, the algorithms used, and the results obtained.in your logbook and on your project. Use the MLA or the APA method of citing your resource. Do not discount libraries for resources.

Bias in AI

BE CAREFUL: As a scientist you should always be aware that bias can be trained into AI models. It is always important to critically assess all information you receive.

Make sure to address and note any bias in your project. Research bias and conflicts within the AI information.

Limitations of AI

Though the technology is always improving you must remember that the AI or LLM cannot always understand complex and content specific requests. Always start with clear, precise questions. Refine your questions to where you want the AI to specifically target. Remember though the AI is not a replacement for your own critical thinking or good research. AI and LLM research are not yours but a machine's code.

Mentoring

It is always advisable to seek a mentor when working with AI and LLM's. This can include parents, teachers and professionals in the field of your research. Their guidance will help you navigate the wonders and pit falls of the new technology.

All new technology must be used wisely and responsibly. Your science project should reflect this process. Remember to follow all standards of ethics, safety and scientific inquiry when doing your project. We hope to see your amazing projects at the Quinte Regional Science and Technology Fair.

Educators and students can be supported in incorporating artificial intelligence by providing training and professional development opportunities, offering accessible tools and platforms for AI integration, and fostering mentorship and guidance. Collaboration with industry experts and establishing partnerships between schools, organizations, and institutions can also provide valuable support and resources for educators and students venturing into AI-driven science fair projects.

What can AI do to help with your science project:

Idea generation:

- Sparks for brainstorming ideas **https://mystemspace.ca/spark/**
- Brainstorming
- Refining of an idea
- Research questions, hypothesis or experiment designs
- Expand on your idea for a science fair project.

Research:

- Research on your chosen topic
- Background information
- Places to look for more information

Clarification

- AI can clarify and explain complex scientific theories and concepts.
- Also, it can help with complex equations
- Remember to check all computations and formulas to help with understanding and for your communication of the project.

Doing the Experiment

- Help with refining your idea and your experimental procedures or your case study idea.
- AI can provide suggestions and check for inaccuracies, control variables and ensure the experiment's safety.
- Make sure you check in with all mentors and co-ordinate procedures.

Analysis of Data

- There are many areas that AI can help with the analysis of data (techniques, statistical tests or software tools)
- Don't forget to use other methods to check your data or information
- Double check all findings

Presentation of Data

- AI can help with the creation of presentations that present your data such as graphs, charts, or diagrams.
- They can also help create 3d figures for your procedure.
- Make sure all data is checked over.

Additional Resources:

AI Sites:

Chat GPT https://chat.openai.com/auth/login

Khan Academy's https://www.khanacademy.org/khan-labs

BARD https://bard.google.com

Tinywow Search Tools - TinyWow

100% [FREE] AI Writer | ToolBaz.com

Background

AI vs. Machine Learning vs. Deep Learning vs. Neural Networks: What's the difference?

Video: How Large Language Models Work

Harvard Business School: Student Use Cases for AI

ChatGPT: An Introduction for Educators

Statement from the International Baccalaureate about Artificial Intelligence in Education

Ethical AI for Teaching and Learning

Shedding light on AI Bias with Real World Examples

How to Cite AI Use