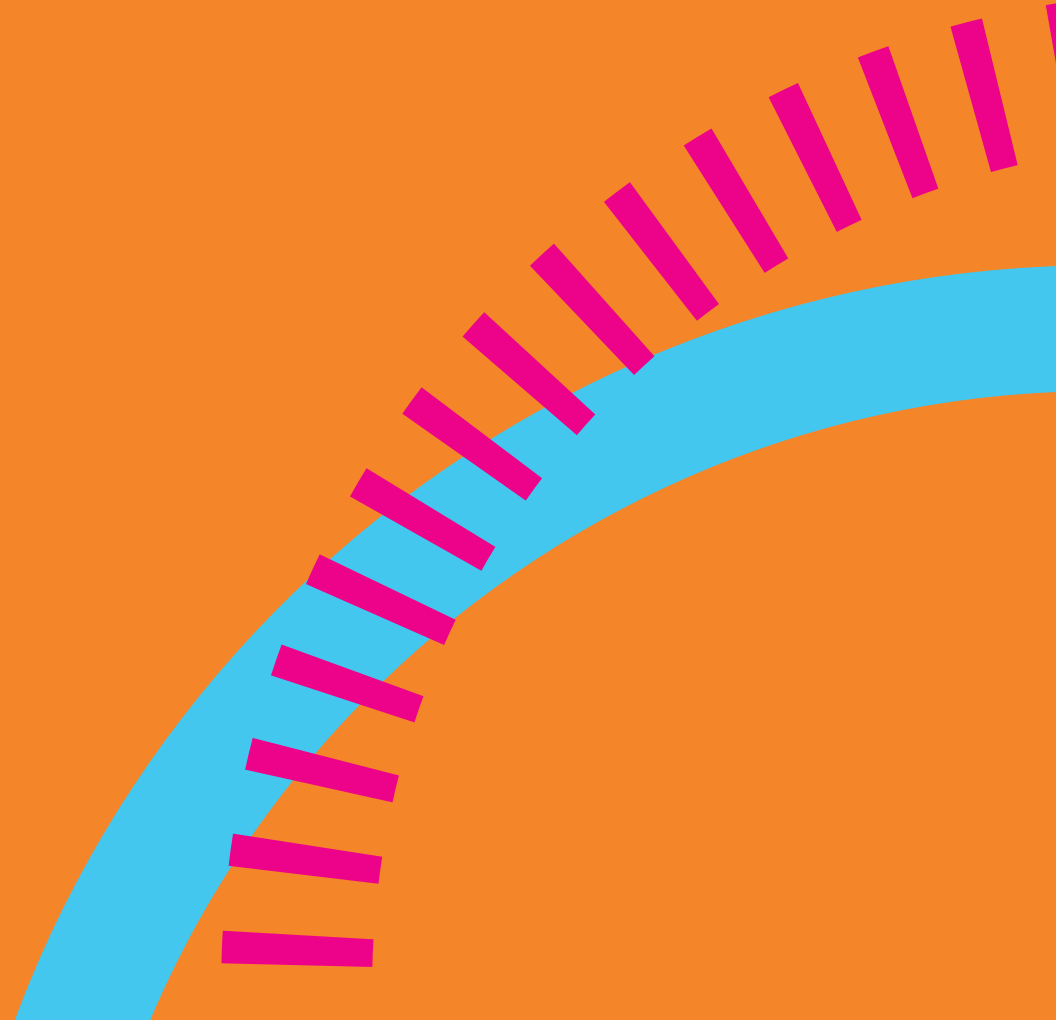


GUIDING QUESTIONS TO CREATE RESPONSIBLE, ETHICAL AI FOR GOOD

 **TECHNOVATION**
Families

Hogan
Lovells



HOW TO USE THIS GUIDE WITH LEARNERS

This set of guiding questions is intended to help those who want to use AI to make positive change in the world.

Educators and parents can use this guide to lead conversations about AI including:

- What AI is and common places it's used
- How to assess new technologies, including AI applications, for unintended negative impacts
- What ethics are and why they're important to consider in AI

ABOUT TECHNOVATION

Technovation is the global tech education nonprofit that inspires girls and families to be leaders and problem solvers in their lives and in their community.

Through hands-on learning programs we bring together families, schools, communities, and industry mentors to learn and create with cutting-edge technologies, like artificial intelligence.



"It's important for families in my community to learn about AI technology, because families should feel that they have the capability to make differences in the world."

Sheila B.
Technovation Community Partner

To date, Technovation programs have reached more than 130,000 youth and adults in 100+ countries, supported by 28,000 mentors and educators.

Become part of our global community of learners, leaders, and changemakers.

[Learn about Technovation programs](#) ▶

Technovation worked with Hogan Lovells US LLP, a law firm that advises on artificial intelligence issues, to create this resource.

WHAT IS ARTIFICIAL INTELLIGENCE?

Intelligence is the ability to learn new tasks and creatively achieve goals. All humans are intelligent, because we learn and do new things all the time!

Computer scientists have developed ways for computers to use data to creatively achieve goals too, and this technology is what we call “artificial intelligence,” or AI.

This idea leads to some big questions:

1. How does AI achieve goals?

Computers achieve goals by using data, or information. Data can take the form of many things—from sound and video to photographs, words, numbers, and measurements. Once enough data is collected, the AI can be programmed to search for patterns and make decisions that help them achieve goals. For example, an AI product could have the goal of classifying talking versus singing.

2. How do computers collect data?

Computers can collect data through sensors, such as cameras, microphones, buttons, and more. These sensors are used the same way we use our eyes and ears—to gather information.

3. How is AI being used?

You probably use AI everyday! YouTube has likely recommended videos you may want to watch. These recommendations are made using AI—the AI built into YouTube looks for patterns in the types of videos you like to watch, and finds similar ones to recommend to you!

AI is also used to help doctors take care of people. For example, AI technologies are very good at detecting patterns in images that may help diagnose different health problems. AI can also help people better understand our climate. AI technologies are being used to find weather patterns to help farmers understand which crops will grow best on different parts of their land.

4. How can communities use AI to help the world?

This is where you come in! Because AI has the potential to change the way people live everywhere, it’s very important for people from all over the world to understand how it works. Together, we can create solutions to big problems and better avoid potential harms.

Want to see some examples of how families around the world are using AI to help their communities?

Take a look at the last page of this guide! Six real families had the chance to present their ideas to AI experts last year at Technovation Families’ inaugural AI World Championship.

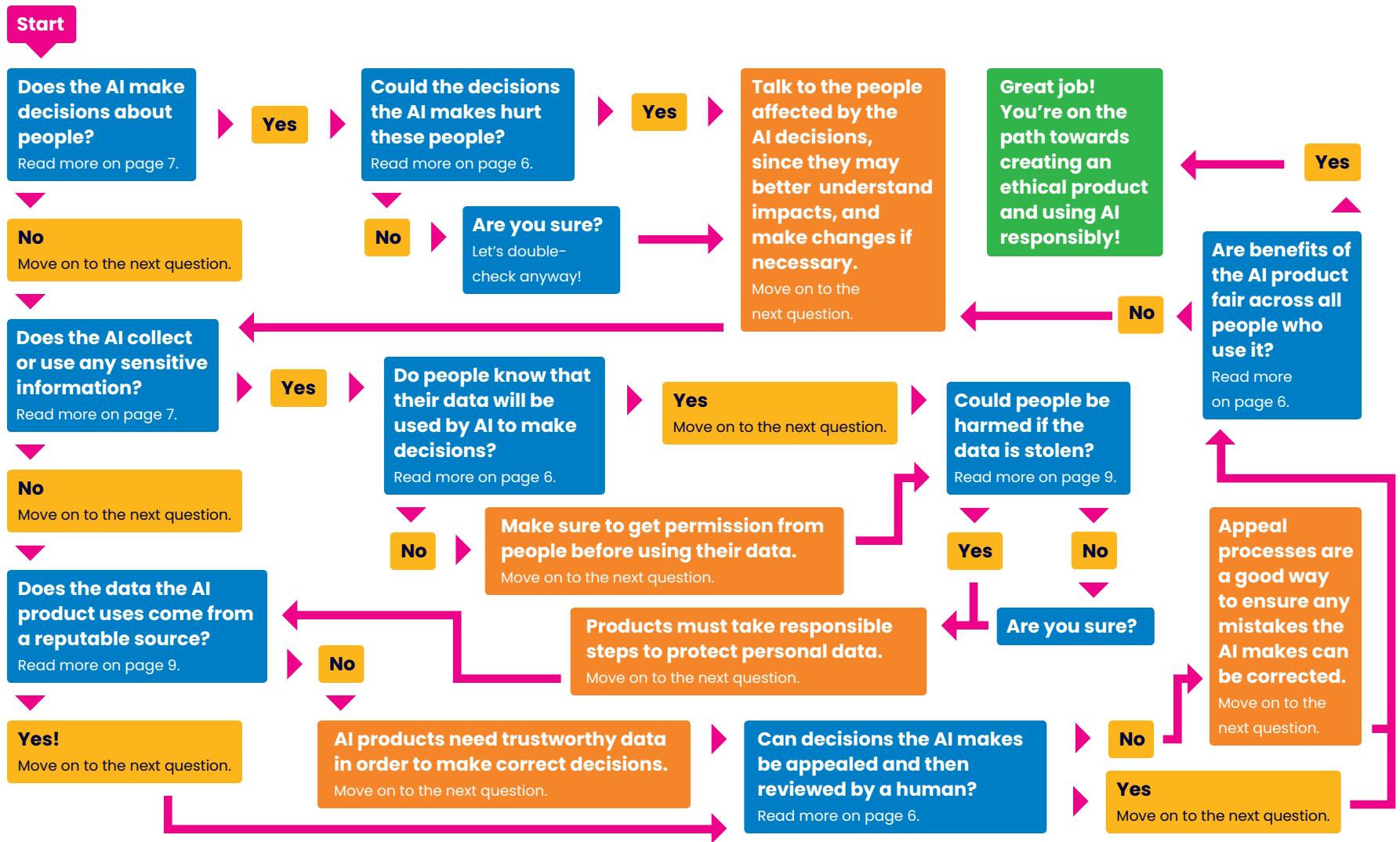
You can start your own project by signing up for Technovation Families, too!

**Sign up for
Technovation Families ▶**



DECISION TREE FOR ETHICAL AI

This flowchart shows a process an AI developer might follow to check that their AI product makes ethical decisions and treats the data it collects or uses responsibly. To start, you'll need to know what decisions an AI product makes. For example, a video recommender makes decisions about what videos to suggest for a person to watch.



USING OR BUILDING WITH AI? KEEP THESE QUESTIONS IN MIND.

QUESTION 1

What decisions is the AI making?

While some decisions (or classifications), such as whether a plant is a weed or not, may be harmless, others may have negative consequences, especially if the model informs certain actions.

A model could be designed to guess an individuals' gender or determine whether an individual has a disability or illness.

AI creators need to consider the risk that their AI might mistakenly "misclassify" something.

QUESTION 2

After the AI makes a decision, what action does it take next?

Answers to this question are important to understand the good, and bad, impacts of the technology.

Decisions to change the actions your product takes to reduce the potential harms can most easily be made before development has started, but addressing potential issues any time before a product is brought to market is better than not addressing them at all.

QUESTION 3

What would happen if the AI makes a mistake?

Before a product idea enters development, it is important to think about what might happen if your model misclassifies a person, object, or other information.

What are the potential worst-case scenarios if your product makes an error? It's important to think about how errors might impact the purpose of your product or cause harm.



USING OR BUILDING WITH AI? KEEP THESE QUESTIONS IN MIND.

QUESTION 4

If the AI product is making decisions about people, could these decisions hurt them?

Products that use AI can impact people differently.

Will the AI:

- Reveal secrets or sensitive information about a person to others?
- Harm the way people think about someone?
- Decide that a person will not be invited to join a team or hired for a job?
- Decide that a person can't go to a doctor when the person is sick. For example, by deciding that the person can't get health insurance or that it costs too much to save a person?

Quick quiz: Which of the following could negatively impact someone?

- A. Sharing personal information about someone with their classmates so they can get to know them better
- B. Determining whether someone is a good fit to join a school club or not
- C. Determining whether someone is sick enough to go to the doctor, or if they should just stay home and rest instead
- D. Sharing predictions about how students might perform on a test with the class so they know who to study with
- E. All of the above

QUESTION 5

Who benefits from the decisions of the AI? Are benefits fair across all people?

Certain groups may be more positively or negatively affected by an AI product's decisions than other groups, and developers should be aware about these potential consequences.

Correct Answer: E

USING OR BUILDING WITH AI? KEEP THESE QUESTIONS IN MIND.

QUESTION 6

Does the AI make decisions about people?

If the answer is “yes”, have you talked to the people who might be affected by those decisions?

Developers should talk to those affected by the decisions to make sure the AI respects human rights of all potentially impacted people.

QUESTION 7

Does the AI consider any sensitive information when making a decision?

Not only may decisions based on any of the following information be illegal in some countries, but the decisions may be unfair or biased against certain people:

- race
- sex, gender, or sexual orientation
- age
- religion
- disability status
- citizenship status
- socioeconomic class



USING OR BUILDING WITH AI? KEEP THESE QUESTIONS IN MIND.

QUESTION 8

Does the AI consider characteristics that might give clues about sensitive characteristics?

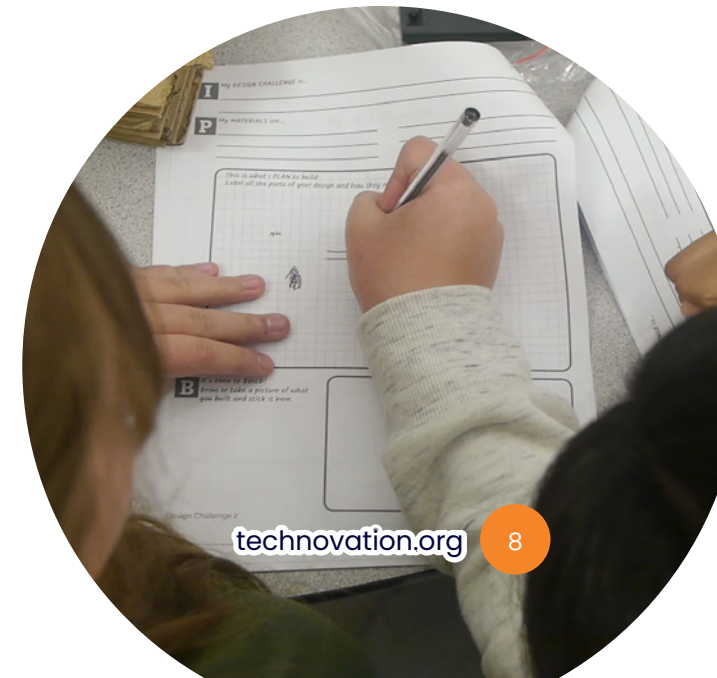
Even if your product isn't programmed to consider sensitive characteristics, it's possible that you are considering a closely related characteristic that could cause your product to base its decisions on sensitive characteristics.

For example, someone's grade level is closely related to their age. Most students are a similar age at each grade level, and that age stays the same. A product considering "grade level" could just as easily be looking at "age."

QUESTION 9

If the AI makes decisions about people, do those people have an opportunity to challenge the AI-based decision?

One way to reduce the harms of an inaccurate decision would be to give people a way to challenge the AI-based decision. In a challenge, the person could ask that a human review the information and decide whether the model made the right decision.



USING OR BUILDING WITH AI? KEEP THESE QUESTIONS IN MIND.

QUESTION 10

Where did the data the AI uses come from?

Products that use artificial intelligence need to be “trained” to make accurate decisions. That training happens as the AI product reviews and organizes more data. Developers building with AI need a lot of data to train their AI. It is very important that the training data comes from a trustworthy source and are representative of people or objects about which the AI product will make decisions. Untrustworthy training data or data that doesn’t reflect representative people or sources may cause the AI product to develop incorrect classifications and make inaccurate and/or biased decisions.

For example, researchers revealed that facial recognition systems trained on faces from mostly Caucasian people would have difficulty properly classifying faces of African or Asian people.

QUESTION 11

If the AI is using data from people, do they know their data is going to be used to train AI? Do they agree to have their data used in this way?

Laws frequently protect information about people. For example, they may require that the person be told about and agree to the collection and use of their data.

In general, it is better if people know that their information may be used to train an AI product and that they said that is okay.

QUESTION 12

Could people be harmed if the data used by the AI product was made public or stolen? If yes, what steps can be taken to protect that data?

Products might have information that people would want to keep secret or that could be used to harm people if the information was made public.

This information should be protected to reduce the risks that it becomes public.

EXPLORE AI CREATED BY STUDENTS AND FAMILIES JUST LIKE YOU!

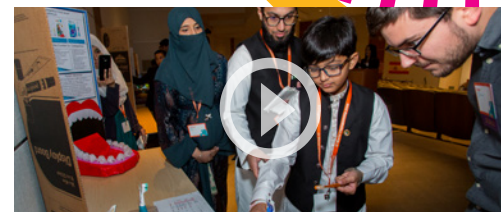
In 2018, more than 7500 families from 13 countries created AI solutions to problems faced in their communities with Technovation Families. Below are videos created by six finalist families to explain how their AI products work. We hope these will help to inspire more families and communities to start creating with AI!



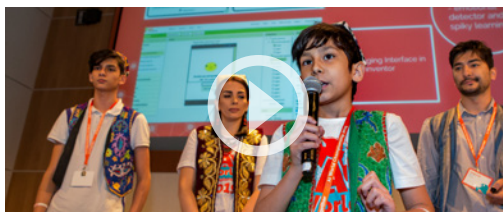
The Hidalgo Family from Bolivia created a robot that uses a camera to collect data for its image recognition algorithm to detect and remove duckweed from Lake Titicaca.



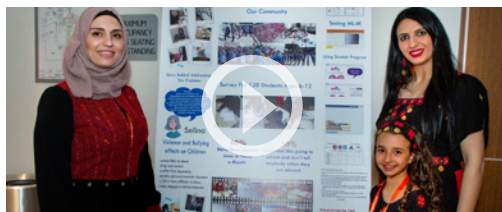
The Pifive Team from Spain created a wearable device that uses image analysis to determine if a swimmer is safe and alert nearby adults if there is risk.



The Mayet Family from Pakistan used AI to monitor a child's brush time and determine their oral health habits, and then notify parents if the child needs help.



The Innovators Team from Uzbekistan made a mobile app that uses machine learning to identify bullying and alert parents if action is needed.



The Rana Family from Palestine used image recognition to analyze children's drawings and notify adults when a child is facing bullying or abuse.



Team De La Paz from the United States used image recognition to determine if a dog is nearby and deter it from staying.



Help students and families use AI to solve community problems—no experience necessary.

Bring Technovation Families to your home and community ►

#AITOGETHER
#TECHNOVATIONFAMILIES

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