



open source
initiative®

What is Open Source AI And how to recognize one

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Google Open Source



The New York Times

Automated tool gets it wrong

Google has an automated tool to detect abusive images of children. But the system can get it wrong, and the consequences are serious.

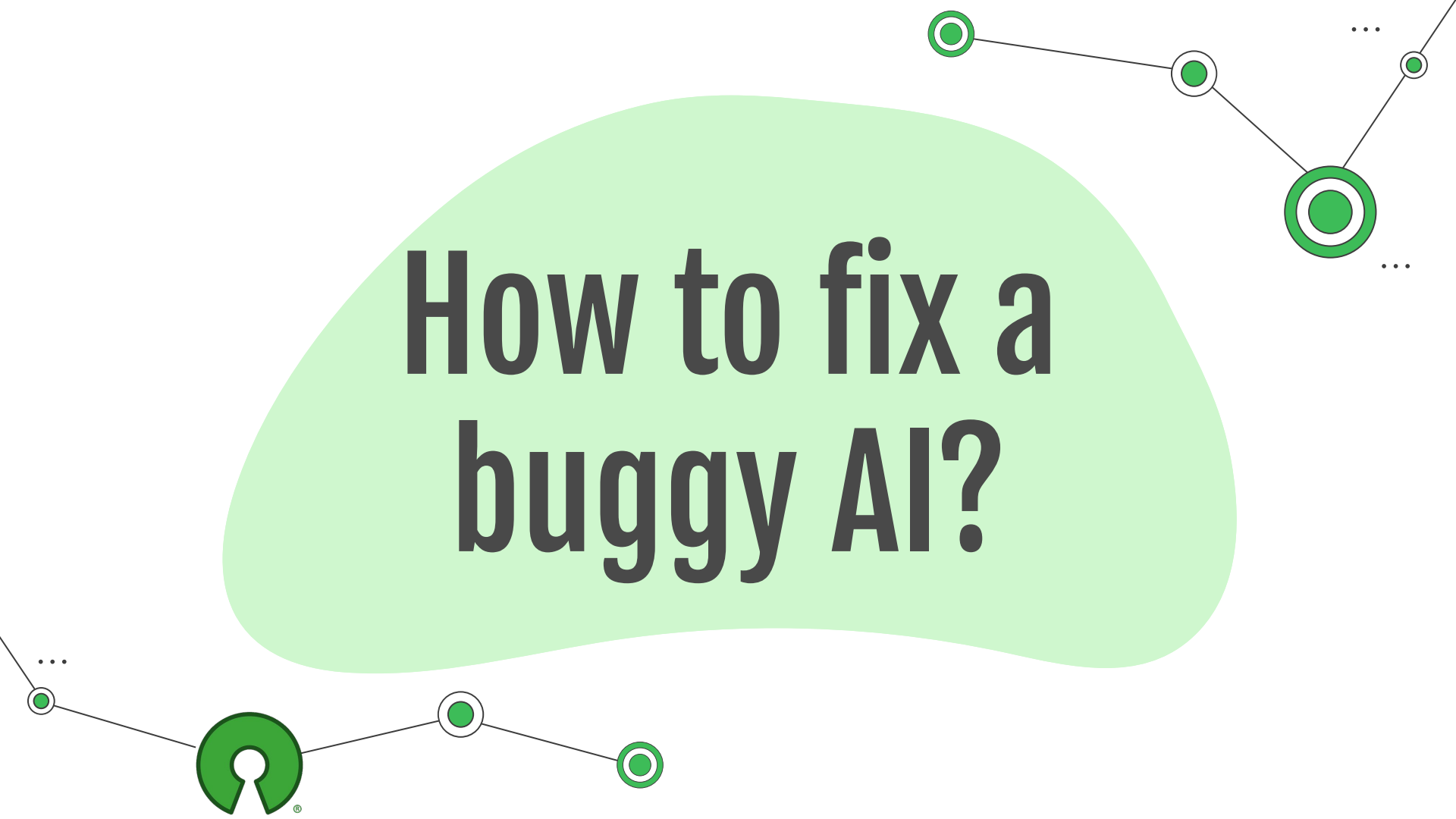
Source: <https://www.nytimes.com/2022/08/21/technology/google-surveillance-toddler-photo.html>





It's a bug

How to fix a buggy AI?



```
20 glBindBuffer(GL_ELEMENT_ARRAY_BUFFER, indexBufferObj);
21 glBufferData(GL_ELEMENT_ARRAY_BUFFER, 6 * sizeof(unsigned int), indices, GL_STATIC_DRAW);
22 // shader
23 unsigned int shader = createShader(readFile("res/shaders/vertex.shader"),
24 readFile("res/shaders/fragment.shader"));
25 glUseProgram(shader);
26 int location1 = glGetUniformLocation(shader, "u_color");
27 while(!glfwWindowShouldClose(window)) {
28     // clear the buffer
29     glClear(GL_COLOR_BUFFER_BIT);
30
31     // sets the background color
32     glClearColor(1.0f, 1.0f, 1.0f, 1.0f);
33
34     // draw
35     glUseProgram(shader);
36     glUniform4f(location1, 85.0f*INV_255, 184.0f*INV_255, 237.0f*INV_255, 1.0f);
37     glBindVertexArray(vertexArrayObj);
38     glDrawElements(GL_TRIANGLES, 6, GL_UNSIGNED_INT, NULL);
39
40     // display bound buffer
41     glfwSwapBuffers(window);
42
```

The black box

How does it do that?

Can we fix it?



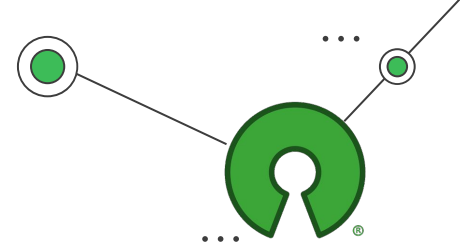


Take a step back

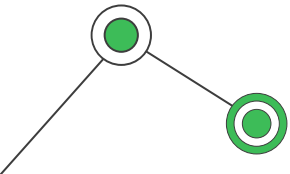


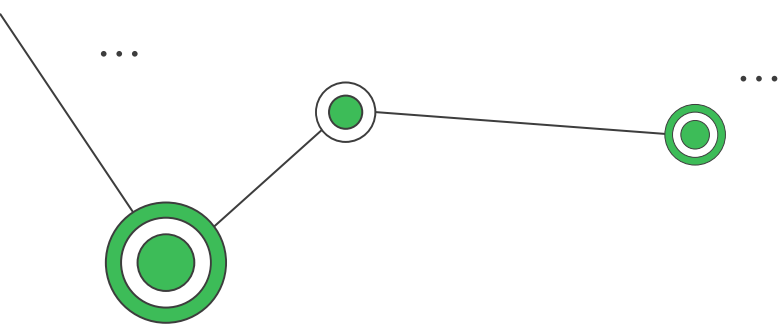
The objective for 2024 Open Source AI Definition

Why OSI did this now



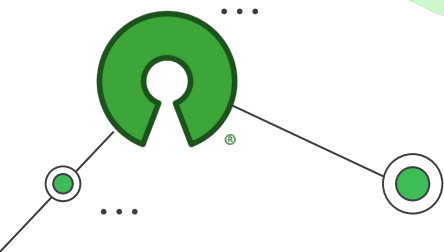
Protect the frontier	Combat Open Washing	Informing regulators
<p>Protect the frontier AI is not “programmed”, we didn’t know what the is the “preferred form in which a programmer would modify the program.” <i>OSD#2</i></p>	<p>Combat Open Washing Actors are calling AI systems “Open Source” even though their licenses contain restrictions that go against the accepted principles of Open Source.</p>	<p>Government regulations have begun in Europe, the United States, and elsewhere. Communities need a common understanding to educate policy makers.</p>

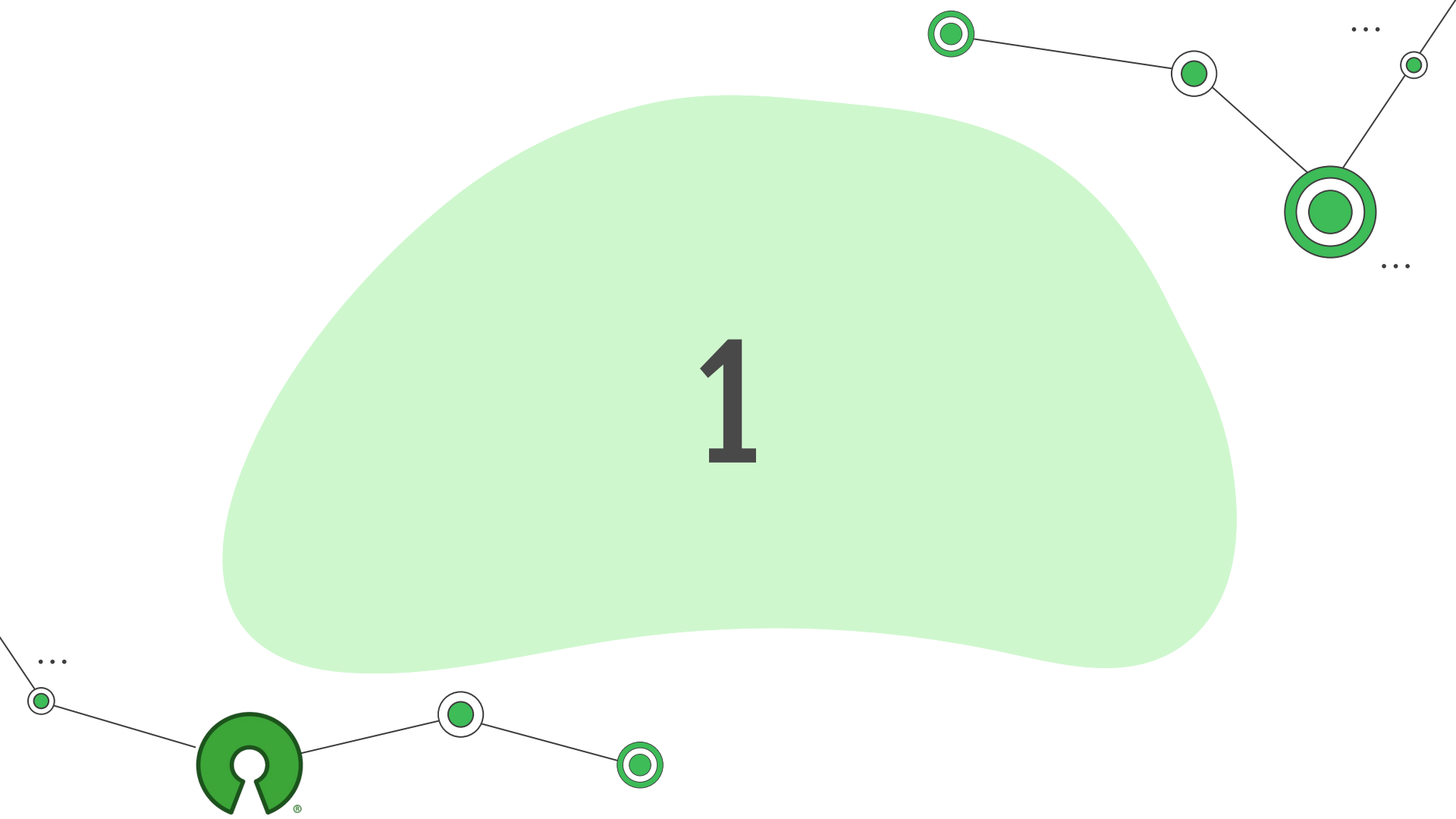




What we've discovered

And how you can get involved



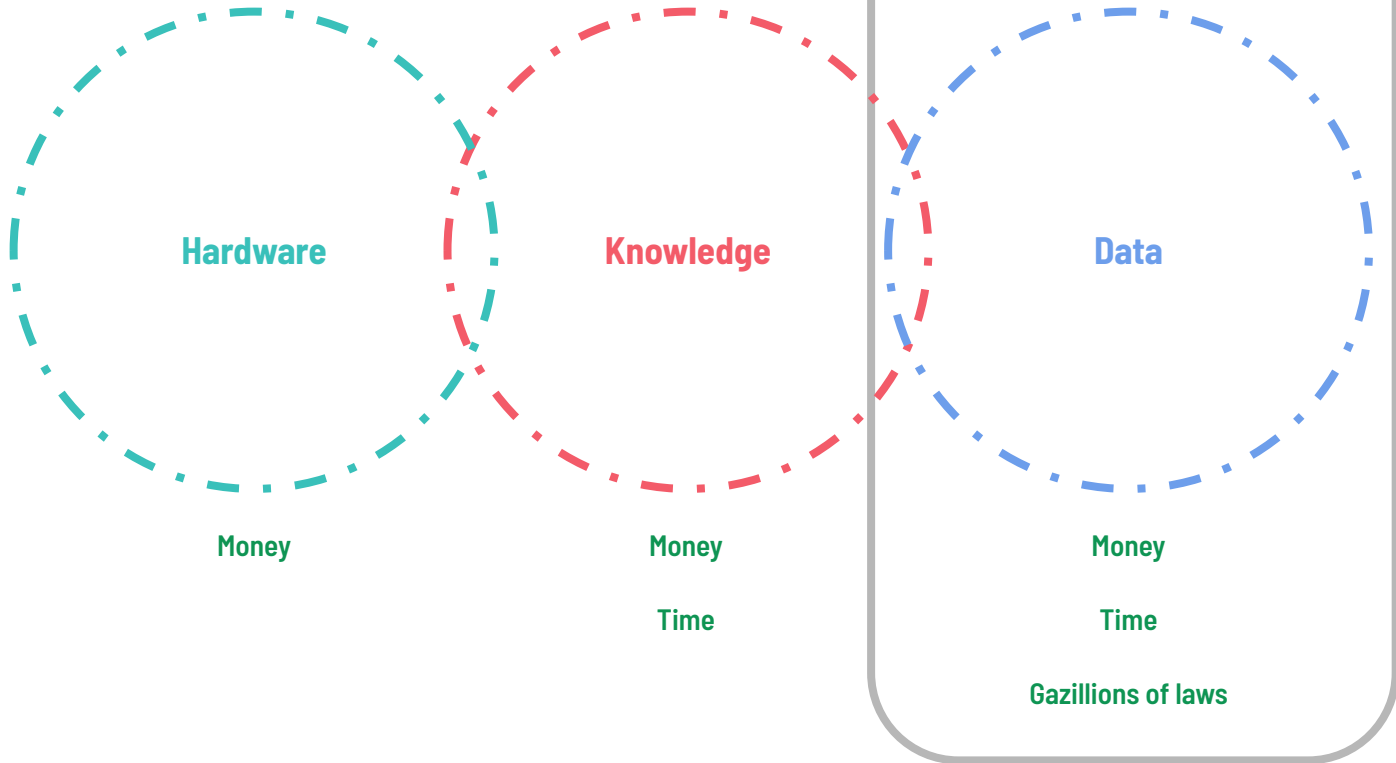


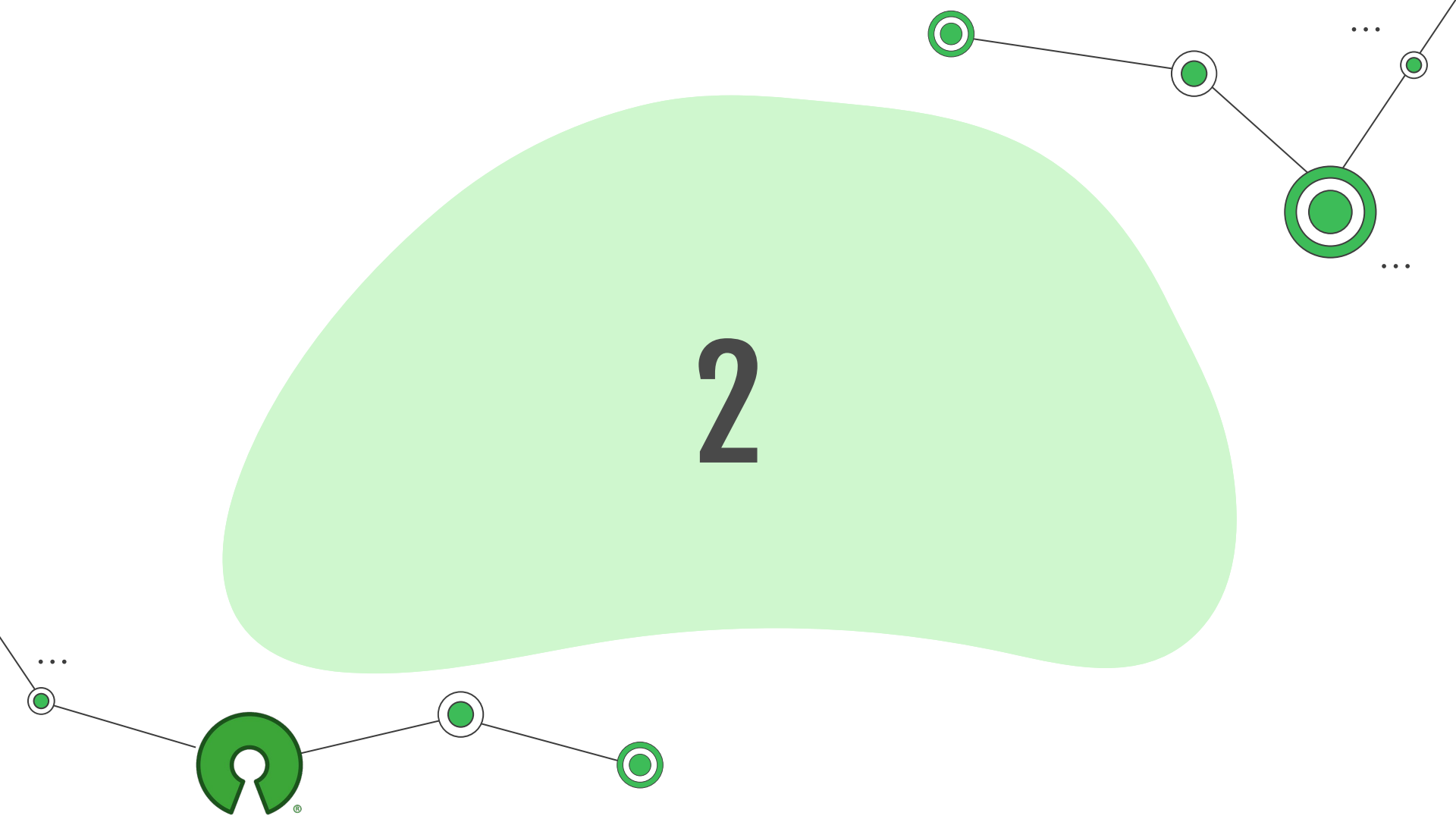
What we've learned

1. We need to define **Open Source AI**, in general, not just machine learning
2. OECD's definition of AI is well accepted (with caveat!)

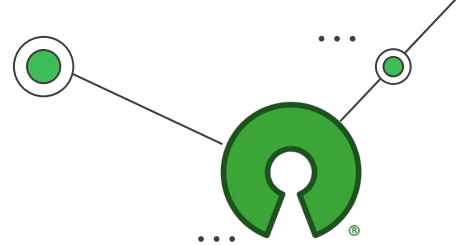
“An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to **generate outputs** such as predictions, content, recommendations, or **decisions** that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.” (2023)

Three building blocks of AI





How Open Source came to be



1: Legal framework

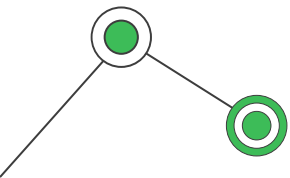
Copyright applied to software, first.
This new artifact became privatized work.
Researchers complained.

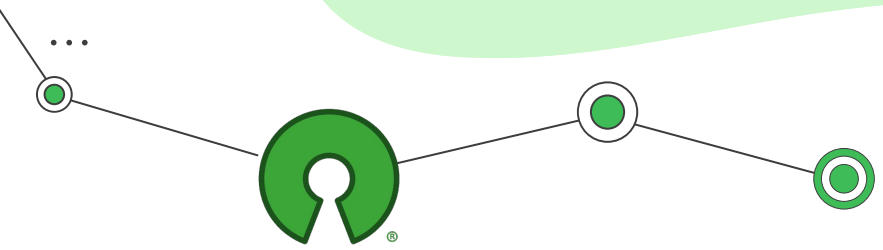
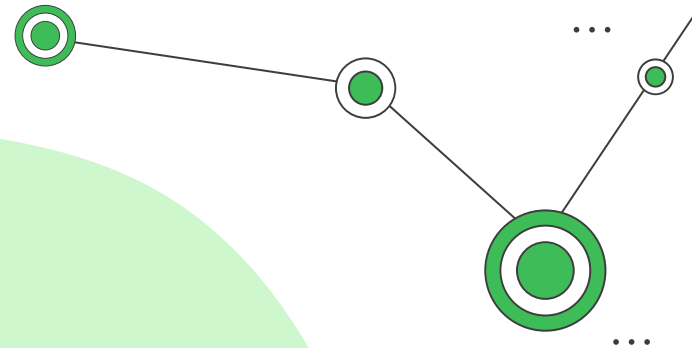
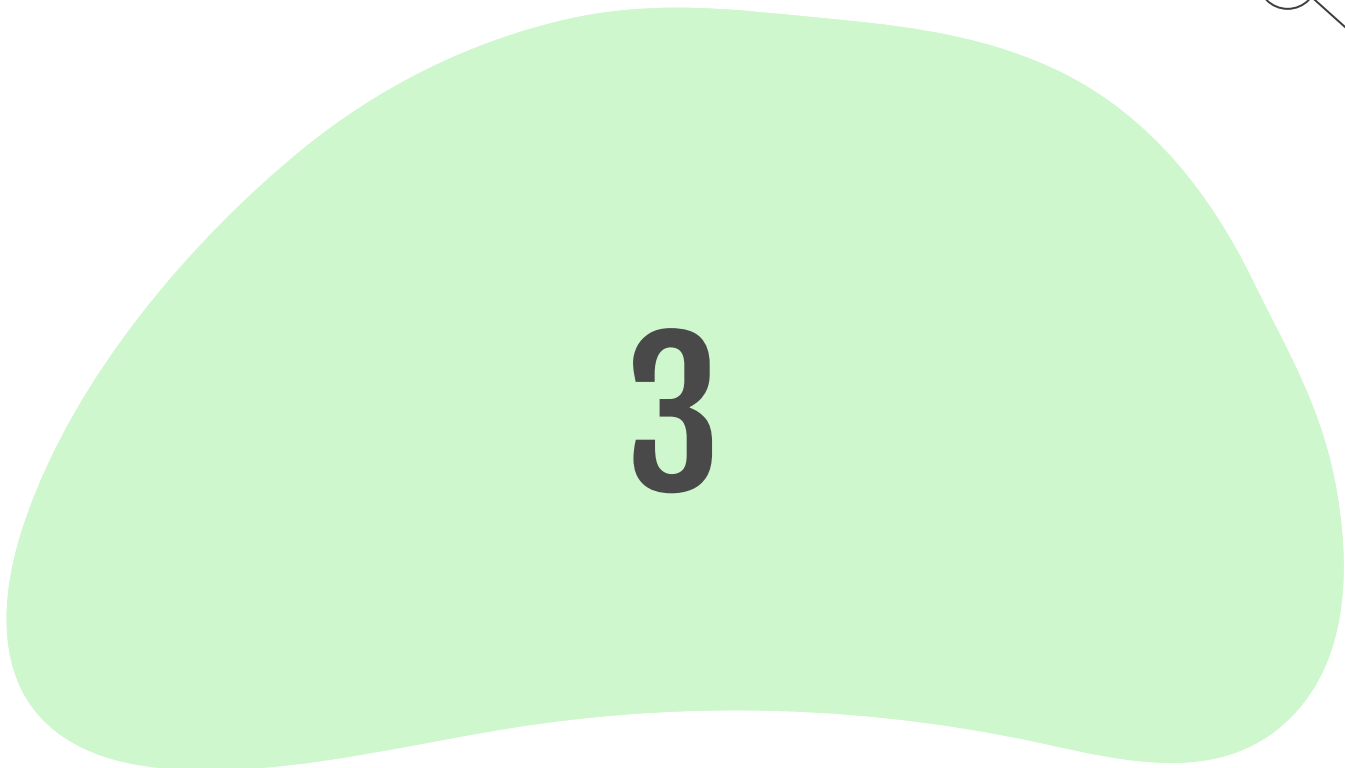
2: Principles

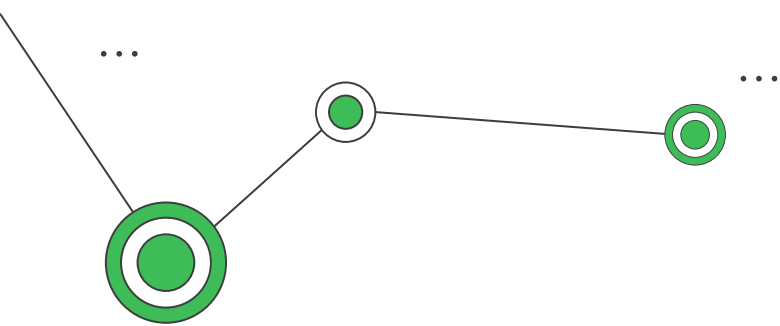
The GNU Manifesto lays the ground to oppose privatization.
A community forms around these principles.

3: Licenses

Copyleft is a hack on copyright.
Incorporating the principles, serving as the Constitution of a forming community.

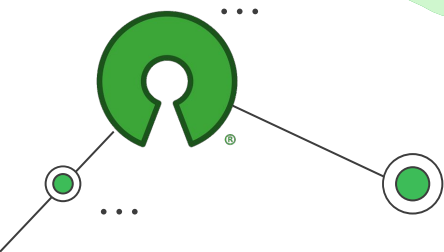






Golden Rule applied to AI

If I like an AI system I must be free to share it with other people.



What is Open Source AI

To be Open Source, an AI system needs to be available under legal terms that grant the freedoms to:

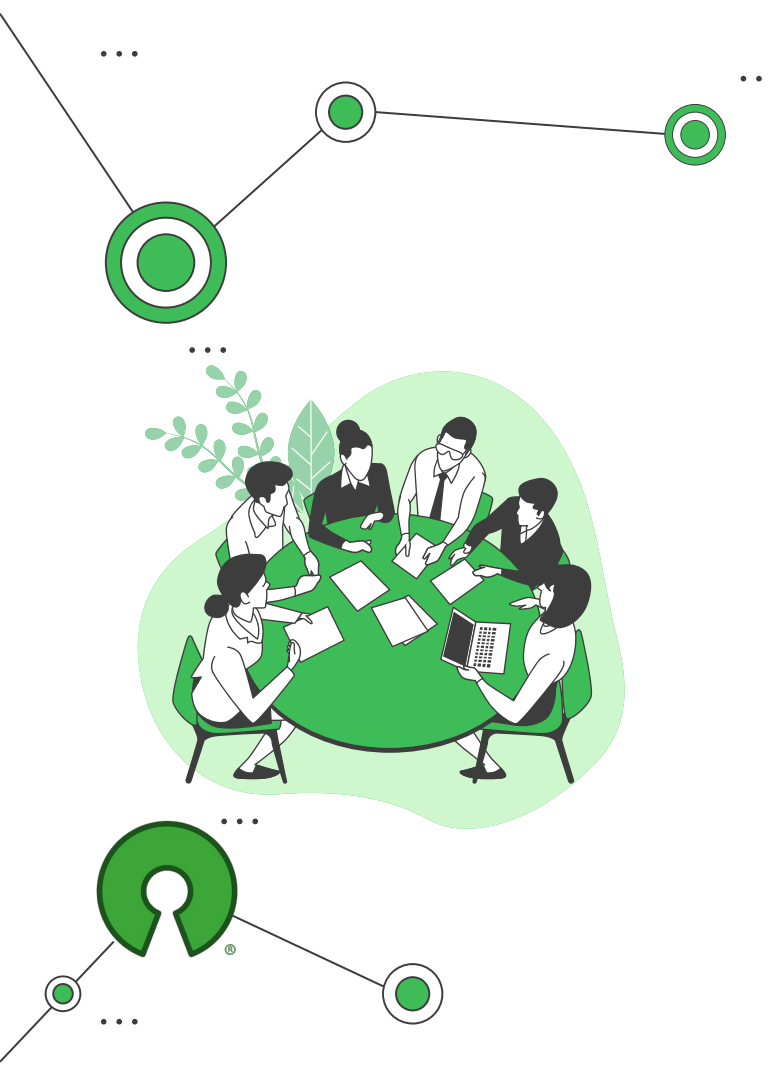
- **Use** the system for any purpose and without having to ask for permission.
- **Study** how the system works and inspect its components.
- **Modify** the system to change its recommendations, predictions or decisions to adapt to your needs.
- **Share** the system with or without modifications, for any purpose.

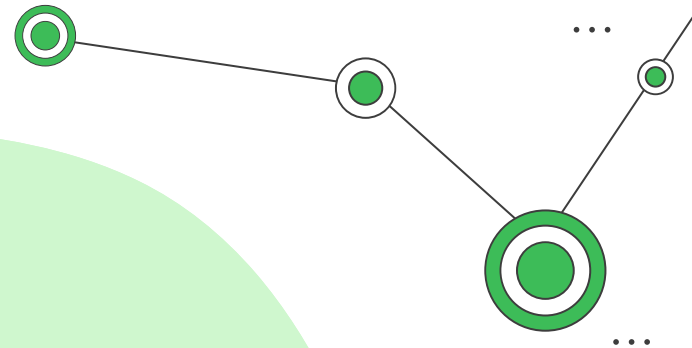
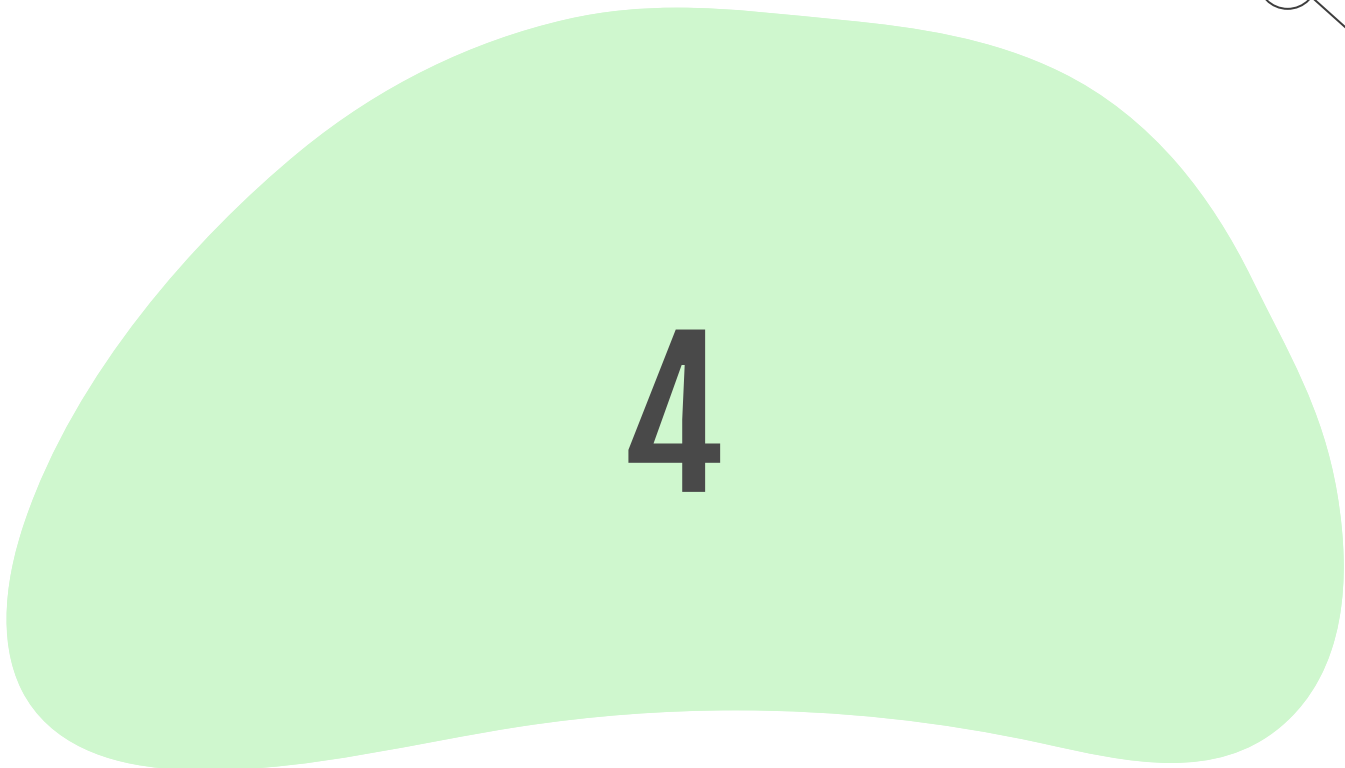
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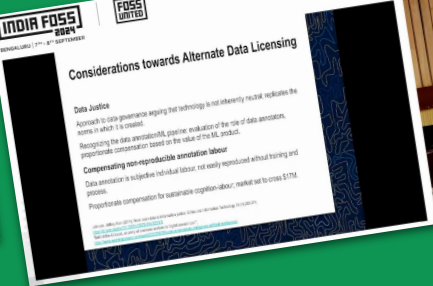
What is the preferred form to make modifications to an AI system?





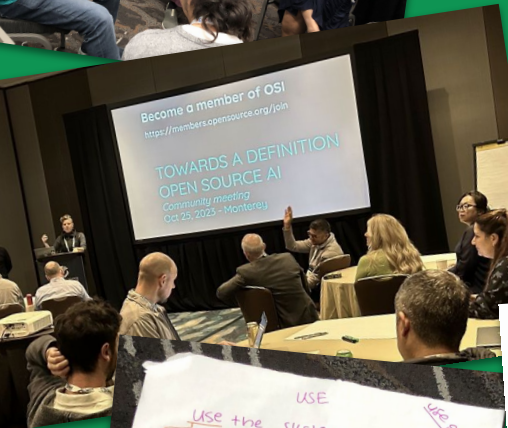
Co-Designing the OSAID A Global Snapshot

Our co-design process included in-person workshops on five continents – South America, North America, Africa, Europe, and Asia – and virtual participants from more than 35 countries.



Study

Study how the AI system works, and inspect its components. Access to AI system components the preferred form to M is a precondition of the



USE

Use the system for any purpose without any limitations and without having to ask for permissions.

USE

Use the system for any purpose without any limitations and without having to ask for permissions.

there should be no limitations on the use of the system

any child

Share

Share the system, with or without modification for any purpose, [without limitations].

The co-design process



As defined by the OECD.

What elements are necessary to:

- use
- study
- modify
- share

an AI system?

Which existing AI systems meet the criteria of the Open Source AI Definition draft?

Promote and ask communities for feedback in worldwide tour of the validated draft. Iterate versions based on feedback.

Formally release a stable version. Continue gathering global feedback, release new versions as necessary.

Open Source AI Definition

The general structure of the document

Basic concepts

Preamble

Why we need Open Source Artificial Intelligence (AI)

It is a general concept that refers to the open and collaborative development of artificial intelligence software. This is different from the traditional closed-source software development model. The open source model allows for greater transparency, collaboration, and innovation in the field of artificial intelligence. It also allows for the development of AI systems that are more robust, secure, and ethical.

What is Open Source AI

When we refer to "Open Source AI", we are talking about the ability to inspect, modify, and improve the source code of an AI system. This is different from the traditional closed-source software development model, where the source code is hidden and the user is limited to the options provided by the developer.

An Open Source AI system must include the source code and the ability to modify it.

- Use the system for any purpose without having to pay for it.
- Study the system to understand how it works.
- Modify the system for your own needs or to improve it.

- Share the system with others so they can use it too.

These freedoms apply to the fully functional system, not to the source code of the system. A system that is not open source is not open source in the general sense of the term.

Preferred form to make modifications to machine-learning systems

The preferred form of making modifications to a machine learning system must be in the form of a code change.

- **Data Information:** The data used to train the system must be available to the user. This is different from the traditional closed-source software development model, where the data is hidden and the user is limited to the options provided by the developer.

- **Code:** The code used to train the system must be available to the user. This is different from the traditional closed-source software development model, where the code is hidden and the user is limited to the options provided by the developer.

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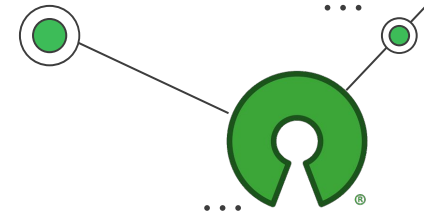
- **Code:** The code used to train the system must be available to the user. This is different from the traditional closed-source software development model, where the code is hidden and the user is limited to the options provided by the developer.

- **Parameters:** The model parameters must be available to the user. This is different from the traditional closed-source software development model, where the parameters are hidden and the user is limited to the options provided by the developer.

The Open Source AI Definition

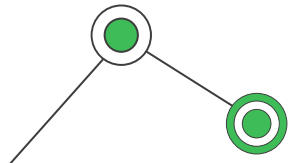
The definition of preferred form to make modifications to machine learning

Clarifications



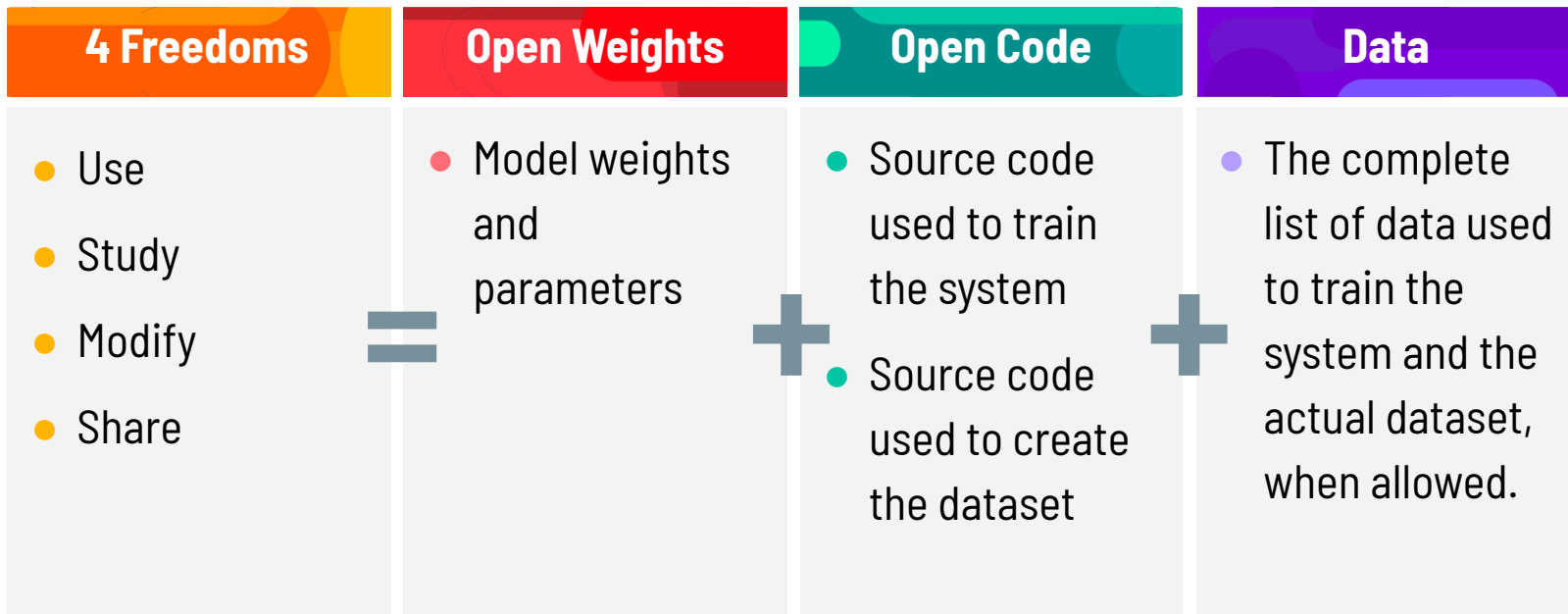
Unlikely to change in the future

Most likely to change in the future





Open Source AI Definition





**We want medical
Open Source AI**

Examples of Open Source AI

Early results validating the Open Source AI Definition

Llama, Mixtral, Granite and many other commercially-produced systems don't comply with the Definition.

How to expand this list is object of future activities of the Open Source Initiative.

OLMo, MoLMo

Allen Institute for AI

Pithya, GPT-J, NEO-X

Eleuther AI

K2, Amber, CrystalCoder

LLM360



StarCoder, BLOOM, Falcon

If they change their agreements



Criticisms



Wrong term!

There is no “source” therefore Open Source AI is the wrong term.

Open Source allows reproducibility but this is not possible, so call it something else.

OSI stretched its mission

OSI should stick to software, let others deal with AI/ML.

The process was unfair

Some people felt excluded. Companies couldn't engage due to the speed and public nature.

Open data must be required

...

Not solved by others

FSF

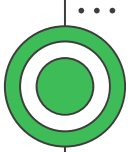
A new dilemma

“It may be that some nonfree ML have **valid moral reasons** for not releasing training data, such as personal medical data. In that case, we would describe the application as a whole as nonfree. But **using it could be ethically excusable** [...]”

SFC

“Aspirational” vision

B. Kuhn: I truly don't know for sure (yet) if the only way to respect user rights[...] is to only use training sets that are publicly available[...]. [I] believe that it will take at least a decade for our best minds to find a reasonable answer





Other criticism

Too restrictive?



Training code and data processing code are not required to “fork”, as demonstrated by thousands of derivatives of Llama with new capabilities.

None of the top commercial releases fit the Definition.

Endorsements

AI creators



Dataset creators



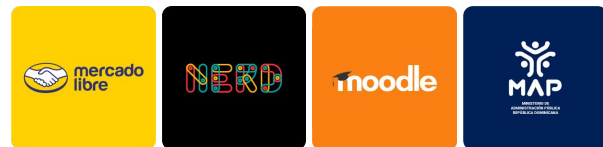
Governments



Consumers of AI

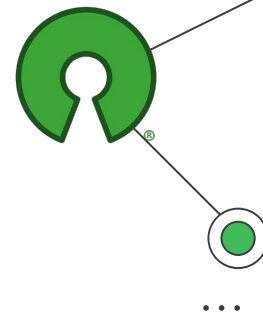


Academia



and many more on

opensource.org/ai/endorsements





What's next

A proposal



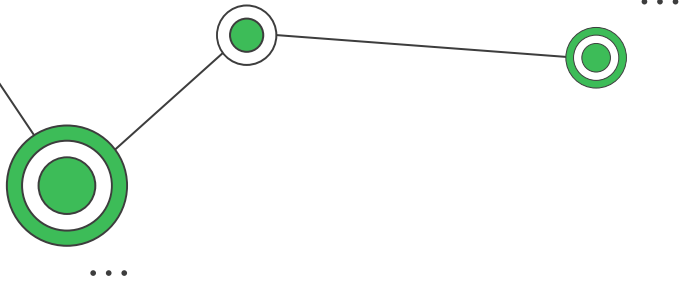
v. 1.0 is a conversation starter!

2025:

- Establish a multilateral working group to address major issues
- Record issues with v.1.0:
 - Fix minor issues
 - Collect major issues

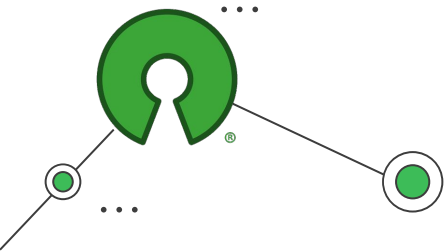
2026:

- Run a process to address major issues
- Fix major issues by Q4



What you can do now

- Endorse v.1.0
<https://opensource.org/ai>
- Spread the word in your circles, translate the definition in other languages
- Correct people who call Llama “open source”: until it uses a license approved by the OSI, it’s clearly not
<https://opensource.org/blog/meta-s-llama-2-license-is-not-open-source>

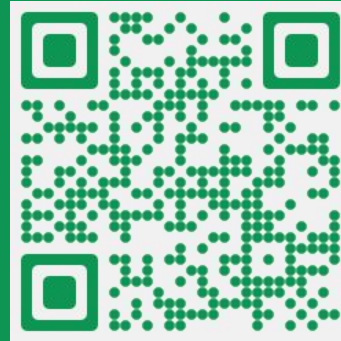


Questions

Become a member of OSI

<https://members.opensource.org/join>

stefano@opensource.org



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