OPEN SOURCE AI DEFINITION

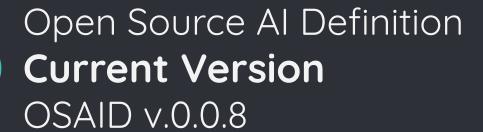
Online public townhall

June 14, 2024

Community agreements

- One Mic, One Speaker -- Please allow one person to speak at a time.
- Take Space, Make Space -- If you tend to talk more, we invite you to make space for others to share. If you tend not to share, we invite you to speak up.
- **Kindness** -- This work is hard, but we don't have to be. Gentleness and curiosity help. Those who use insults or hate speech will need to leave the meeting.
- **Forward Motion** -- We advance by focusing on what is possible in the moment and doing it. Obstacles are marked for later discussion, not used to stop the process. If we hit a boulder, we note it on the map and keep walking. We'll come back and unearth it later on.
- **Solution-Seeking** -- This work is so complex that focusing on what won't work will stop it. Suggesting new ideas, options, and proposals is vulnerable, but crucial. All of us are needed to make this work.
- Anything else?





Open Source Al Definition v.0.0.8

Preamble

4 Freedoms

Legal Checklist

What is Open Source Al

Use the system for any purpose and without having to ask for permissio
 Study how the system works and inspect its components.

Why we need Open Source Artificial Intelligence (AI)

Open Source has demonstrated that massive benefits active to everyone when you remove the barriers to learning, using, when you and improving ordinary explaints. These benefits are the result of using licenses that adhere to the Open Source Definition. The benefits can be summarized as autonomy, transparency, fricheless reuse, and collaborative improvement. Everyone needs these benefits in A. We need essential freedoms to make users to build and

- Modify the system for any purpose, including to change its output.
- Share the system for others to use with or without modifications, for any purpose.

Precondition to exercise these freedoms is to have access to the preferred form to make modifications to the system.

systems

Preamble

The preferred form of making modifications for a machine-learning Open Source Al must include:

- Data information: Sufficiently detailed information about the data used to train the system, so that a skilled person can recreate a substantially equivalent system using the same or unitial data.
- same or similar data.

 For example, if used, this would include the training methodologies and techniques, the training data sets used, information about the provenance of those data sets, their scope and characteristics, how the data was obtained and selected, the labeling
- procedures and data cleaning methodologies.

 Code: The source code used to train and run the system.
- For example, if used, this would include code used for pre-processing data, code used for training, validation and testing, supporting libraries like tokenizers and hyperparameters search code, inference code, and model architecture.
- hyperparameters search ode, inference code, and model architecture.

 Model: The model parameters.

 For example, this might include checkpoints from key intermediate stages of training

Checklist to evaluate machine learning systems

This checklist is based on the paper The Model Openness Framework: Promoting Completeness and Openness for Reproducibility, Transparency and Usability in Al

Table of default required components

Required components	Legal frameworks
Data information	
- Training methodologies and techniques	Available under OSD- compliant license
- Training data scope and characteristics	Available under OSD- compliant license
- Training data provenance (including how data was obtained and selected)	Available under OSD- compliant license
- Training data labeling procedures, if used	Available under OSD- compliant license
- Training data cleaning methodology	Available under OSD- compliant license
Code	
- Data pre-processing	Available under 0 II-approved license
- Training, validation and testing	Available under 0 \$1-approved license
- Inference	Available under 0 \$I-approved license
- Supporting libraries and tools	Available under 0 SI-approved license
Model	
- Model architecture	Available under OSI-approved license
- Model parameters	Available under OSD- conformant terms

The following components are not required as the preferred form of making modifications, but

itional components	Legal frameworks
ta information All data sets, including:	
raining data sets	Available under OSD-compliar license
esting data sets	Available under OSD-compliar license
falidation data sets	Available under OSD-compliae license
lenchmarking data sets	Available under OSD-compliar license
Pata card	Available under OSD-compliar license
Controller date	Available under OSD-complia





Source Al Definition Data Information

v.0.0.8



Data Information - Training methodologies and techniques - Training data scope and characteristics - Training data provenance (including how data was obtained and selected) - Training data labeling procedures, if used - Training data cleaning methodology

- Training data sets

Preamble

Why we need Open Source Artificial Intelligence (AI)

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Everyone needs these benefits in Al. We need essential freedoms to enable users to build and deploy Al systems that are reliable and transparent.

What is Open Source Al

An Open Source Al is an Al system made available under 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 component . Modify the system for any purpose, including to change its output
- . Share the system for others to use with or without modifications, for any purpose

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Preferred form to make modifications to machine-learning

The preferred form of making modifications for a machine-learning Open Source Al must

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- hyperparameters search code, inference code, and model architecture. . Model: The model parameters.
- For example, this might include checkpoints from key intermediate stages of training as well as the final optimizer state.

Checklist to evaluate machine learning systems

Legal frameworks

Table of default required components

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Ontional components Lengt frameworks Available under OSD-compliant Training data sets Available under OSD-complian Testing data sets Available under OSD-compliant Validation data sets Available under OSD-compliant Available under OSD-complian Available under OSD-compliant - Evaluation data

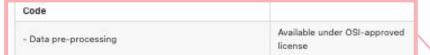


Requiring only data information...

...instead of training datasets is the greatest point of debate now.

Open Source Al Definition Other Components

v.0.0.8





Available under OSD-compliant - Data card license

Preamble

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Checklist to evaluate machine learning systems

Table of default required components

- Model parameters

Required components	Legal frameworks		
Data information			
- Training methodologies and techniques	Available under OSD- compliant license		
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- Training, validation and testing	Ricense
- Inference	Available under OSI-approved license
- Supporting libraries and tools	Available under OSI-approved
Model	
- Model explicit extrem	Available under OSI-approved

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conformant terms

Optional components	Legal frameworks
Data Information All data sets, including:	
- Training data sets	Available under OSD-compliant license
- Testing data sets	Available under OSD-compliant license
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- Benchmarking data sets	Available under OSD-compliant linense
- Data card	Available under OSD-compliant license
- Evaluation data	Grense



Others have proposed...

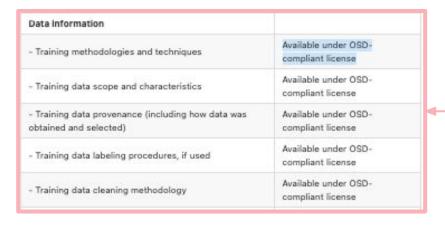
... removing data pre-processing code requirement if training data is not required.

...requiring a model card

... and data card to standardize system documentation.

Open Source Al Definition Describing Legal Requirements

v.0.0.8



- Model parameters Available under OSDconformant terms

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Data card	Available under OSD-compliant license		
Evaluation data	Available under OSD-compliant license		



In contrast to the clear "OSI-approved" licenses available for code components...

... the "OSD compliant" requirement for data information...

...and "OSD conformant" requirement for model parameters have been challenging for reviewers to interpret.

Preferred form to make modifications

Data information

Sufficiently **detailed information** about the data used to train the system, so that a skilled person can **recreate** a substantially equivalent system using the same or similar data.

Code

The source code used to train and run the system.

Model

The model parameters (weights and biases)

Data Information Explained

- The intention of *Data information* is to allow developers to **recreate** a substantially **equivalent system** using **the same or similar** data.
- Came out of the systems review process, with votes by volunteers.

Zooming in on the issues with datasets

- The Pile taken down after an alleged copyright infringement in the US. But legal in Japan. Maybe legal in EU
- DOLMA, initially had a restrictive license. Later switched to a permissive one. Suffers from the same legal uncertainties of the Pile, however the Allen Institute has not been sued, yet.
- Training techniques that preserve privacy like federated learning don't create datasets.

Alternative proposals

- Use synthetic data: Experimental, unproven technology, limited to corner cases
- All their components must be "open source": This integralism ignores that even the GNU project accepts system library exceptions and other compromises.



Validation Reviewers

We're interested in reviewing about 10 AI systems self-described as open as part of this definition validation phase. Those marked (*) have were reviewed in previous phases.

1. Arctic

1. **Jesús M. Gonzalez-Barahona**Universidad Rey Juan
Carlos

2. BLOOM*

- 2. **Danish Contractor**BLOOM Model Gov.
 Work Group
- Jaan Li University of Tartu, One Fact Foundation

3. Falcon

- 1. Casey Valk Nutanix
- Jean-Pierre Lorre LINAGORA, OpenLLM-France

4. Grok

- 1. **Victor Lu** independent database consultant
- 2. **Karsten Wade** Open Community Architects

5. Llama 2*

- Davide Testuggine
 Meta
- 2. **Jonathan Torres** Meta
- Stefano Zacchiroli
 Polytechnic Institute of Paris
- 4. **Victor Lu** independent database consultant

9. LLM360

5. **[Team member TBD]** LLM360

We will need an independent reviewer for LLM360

8. Mistral

- Mark Collier
 OpenInfra Foundation
- 2. **Jean-Pierre Lorre** LINAGORA, OpenLLM-France
- 3. Cailean Osborne
 University of Oxford,
 Linux Foundation

7. OLMo

- 4. **Amanda Casari** Google
- 5. **Abdoulaye Diack** Google

8. OpenCV*

9. Phi-2

6. **Seo-Young Isabelle Hwang** Samsung

10. Pythia*

- Seo-Young Isabelle
 Hwang Samsung
- 2. **Stella Biderman** EleutherAl
- Hailey Schoelkopf
 EleutherAl
- 4. **Aviya Skowron** EleutherAl

11. T5

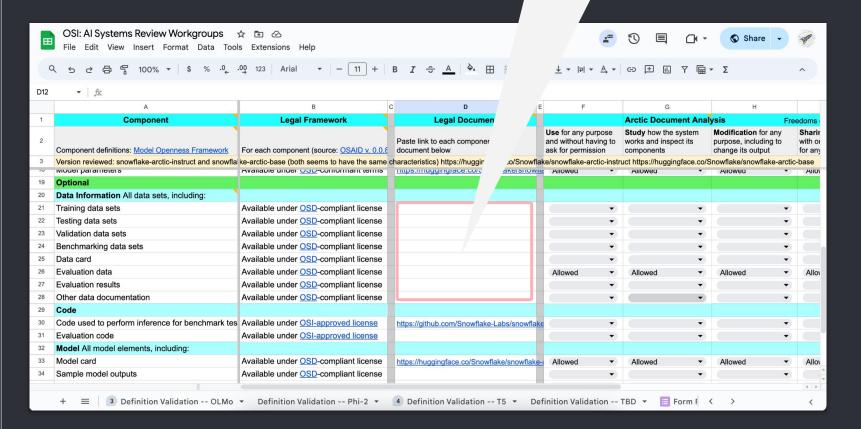
 Jaan Li University of Tartu, One Fact Foundation

Viking

6. **Merlijn Sebrechts** Ghent University

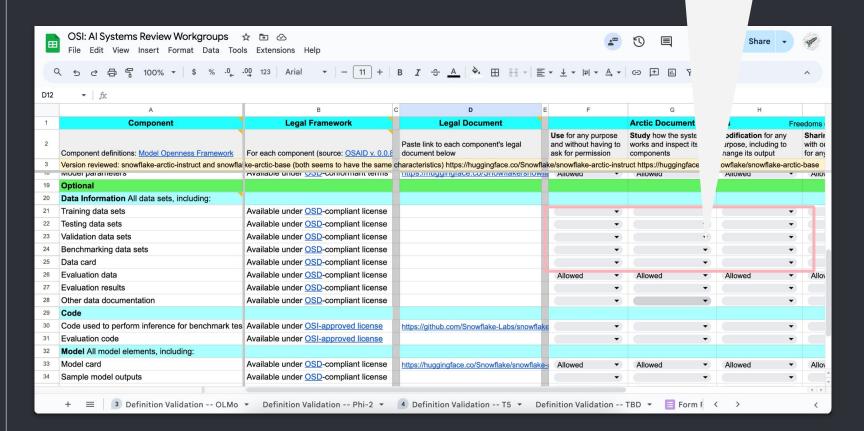
Validation Challenges

It is hard for volunteer reviewers to find required documents independently..



Validation Challenges

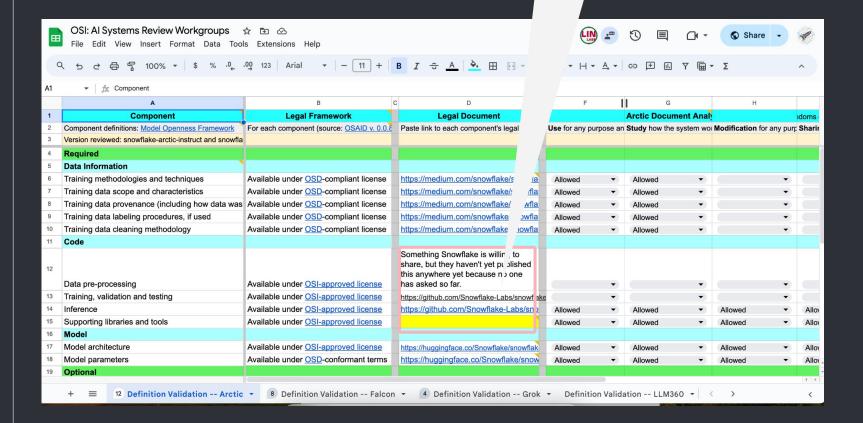
This meant a lot of the review analysis has been incomplete.



Validation Solutions

Having the help of system creators to locate documents has been crucial.

Thank you, Arctic!



Validation Expectations

Given current system information, our expected review results are as follows. If we are missing information, please let us know.

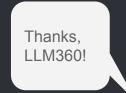
			Confirmed Yes	Expect Yes	Unclear	Expect No	Confirmed No
Al System	Meets OSAID requirements?	Notes	Review complete + all required	Review incomplete + all required		Review incomplete + some or all required	Review complete +
Name of system with link to its review sheet	Based on OSAID v. 0.0.8 and/or v.0.0.6	Summary explanation of status (as of 6	components present	components expected to be present	cannot ascertain oppeness	components expected to be absent	some/all required components absent
TOVICW SHOOL	v.o.o.o		,		1 1		
<u>Arctic</u>	Expect Yes	Verbal confirmation from Snowf (6/3/24)	lake, which	is adding lega	I document	s to review sh	eet
<u>BLOOM</u>	Confirmed No	Usage restrictions in RAIL licen	se				
<u>Falcon</u>	Expect No	Documents on training methodo testing are missing	ologies and	techniques an	d training, v	alidation and	
<u>Grok</u>	Expect No	Very little public information on system					
Llama 2	Confirmed No	Data pre-processing + training, validation and testing code are not available					
<u>LLM360</u>	Expect Yes	Self-certified as compliant on the forum, awaiting addition of reviewable documents to their sheet			s to		
<u>Mistral</u>	Confirmed No	Some data information and cod	e componer	nts missing, no	training co	de available	
<u>OLMo</u>	Expect Yes	Supporting libraries and tools u	nclear, but a	II other legal o	locumentat	ion is present	
<u>OpenCV</u>	Unclear	Model requirement unclear bec external deep learning framewo		CV does not st	ore, but ins	tead supports	
Phi-2	Unclear	Data information, code, and mo	del informat	ion missing			
<u>Pythia</u>	Confirmed Yes	Only non-alignment was absence of labeling documentation, which was not created. v 0.0.8 adds "if used" to requirement, resolving this			d. v		
<u>T5</u>	Expect Yes	Only possible restriction is in surequires special hardware. Hard this is likely not a recognized re	dware requir				

Open Source Al Definition What's Next?

June - October 2024

- Complete validation phase
- Resolve comments, release v. 0.0.9 after validation
- Cut the release candidate with sufficient endorsement

Complete the Validation Phase



- Practitive No. 0.8 Review from LLM360

 Visualization of the LLM360 team which is an open research lab enabling openrunity. In an from the LLM360 team which is an open research lab enabling construinty. We to a rec caught up in the what does open sources from environments are comprehensive. The whole one of the caught up in the what does open sources of mean requirements are comprehensive, moughful, and reflect the true nature of open sources.

 We did not find the OOC-8 visualization of the control of the contro
- 1. Reach out to **AI system creators** to fill in the blanks on their own systems by pointing us to correct documentation
- 2. Invite **volunteers** to also help us fill in these blanks

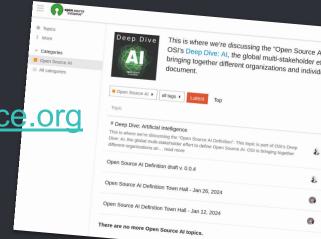
• 20)24 Timelir	ne		System testing work streat Stakeholder consultation was Release schedule	
February	March	April	May	June	October
Call For Volunteers + Activity Feedback and Revision	Virtual System Review Meetings Begin	Virtual System Review Meetings Continue	Virtual Syste Review Meetings END	Feedback Informs Content of OSI In-Person Stakeholder Meeting	Monthly Virtual Meetings
Bi-Weekly Virtual Public Townhalls	Bi-Weekly Virtual Public Townhalls	Bi-Weekly Virtual Public Townhalls	Townhalls + PyCon Workshop May 17th, Pittsburgh)	Townhall + Virtual Launch (≈ Event (date TBD)	Release stable version
Draft 0.0.5	Draft 0.0.6	Draft 0.0.7 and 8	Draft 0.0).9 RC1	Stable Version

In-Person Meetings

Region	Country	City	Conference	Date
North America	United States	Pittsburgh	✓ PyCon US	May 17
Europe	France	Paris	√ 0W2	June 11 - 12
North America	United States	New York	OSPOs for Good	July 9 - 11
Africa	Virtual	Virtual	Sustain Africa	July
Asia Pacific	China	Hong Kong	Al_dev	August 23
Latin America	Argentina	Buenos Aires	Nerdearla	September
Europe	TBD	TBD	(data governance)	October
North America	United States	Raleigh	All Things Open	Oct 27 - 29

Participation Options

- Public forum: <u>discuss.opensource.org</u>
- Become an OSI member
 - Free or or full
 - SSO with other OSI websites
- Biweekly virtual townhalls... like this one!
- Volunteer to help with validation (email or DM Mer Joyce)



Q & A

Thank you

We realize this is difficult work and we appreciate your help and openness in improving the definition.