

**Machine Learning**

Framework	Platform	Library	Framework	Platform	Library	Tool	Reinforcement Learning	Programming
<ul style="list-style-type: none"> <li>Accord.NET</li> <li>Microsoft LightGBM</li> <li>MAHOUT</li> <li>ML.NET</li> <li>RAY</li> <li>ZenML</li> </ul>	<ul style="list-style-type: none"> <li>Angel</li> <li>ForestFlow</li> <li>Alibaba Alink</li> <li>Apache SystemML</li> <li>Graduated</li> <li>Incubating</li> <li>Ax</li> <li>cortex</li> <li>H2O</li> <li>Kubeflow</li> <li>MEAPFLOW</li> <li>mlflow</li> <li>PredictionIO</li> <li>SELDON</li> <li>VOPAL MARKET</li> </ul>	<ul style="list-style-type: none"> <li>1ML</li> <li>AutoGluon</li> <li>CatBoost</li> <li>Flashlight</li> <li>MediaPipe</li> <li>mipack</li> <li>Levens</li> <li>OpenCV</li> <li>openml</li> <li>CARET</li> <li>Learn</li> <li>將軍 Shogun</li> <li>Sonnet</li> <li>Salesforce TransmogriAI</li> <li>dmk XGBoost</li> <li>xLearn</li> </ul>	<ul style="list-style-type: none"> <li>SINGA</li> <li>Chainer</li> <li>Microsoft CNTK</li> <li>ay/net</li> <li>Alibaba euler</li> <li>[M]<sup>s</sup> MindSpore</li> <li>mxnet</li> <li>ncnn</li> <li>飞桨 PaddlePaddle</li> <li>Pythia</li> <li>PYTORCH</li> <li>TensorFlow</li> </ul>	<ul style="list-style-type: none"> <li>TuTV</li> <li>Incubating</li> <li>DeepDetect</li> <li>Determined AI</li> <li>jino</li> <li>Onepanel</li> <li>Polaxon</li> <li>Alibaba.com AI Deep Learning</li> </ul>	<ul style="list-style-type: none"> <li>BigDL</li> <li>Catalyst</li> <li>DL4J</li> <li>fast.ai</li> <li>Keras</li> <li>PyTorch Ignite</li> <li>PyTorch Lightning</li> <li>PyTorchVideo</li> </ul>	<ul style="list-style-type: none"> <li>BeyondML</li> <li>Sandbox</li> <li>BoTorch</li> <li>Intel Distiller</li> <li>ploidML</li> <li>PyTorch Hub</li> <li>PyTorch Proxies</li> <li>tvm</li> </ul>	<ul style="list-style-type: none"> <li>Chainer RL</li> <li>CleanRL</li> <li>Coach</li> <li>DeepMind Lab</li> <li>Dopamine</li> <li>Horizon</li> <li>OpenAI</li> <li>Google PlaNet</li> <li>Google SEED RL</li> <li>Stable Baselines</li> </ul>	<ul style="list-style-type: none"> <li>Pyro</li> <li>Graduated</li> <li>Kompute</li> <li>Incubating</li> <li>DASK</li> <li>Infer.NET</li> <li>Julia</li> <li>MARS</li> <li>Numba</li> <li>NumPy</li> <li>NYOKA</li> <li>primegrate</li> <li>PyMC3</li> <li>python</li> <li>R</li> <li>SciPy</li> <li>SHIP</li> <li>Stan</li> </ul>

**Data**

Education	Lineage	Relational DB	Store & Format	Versioning	Operations	Feature Engineering	Stream Processing	SQL Engine	Visualization	Pipeline Management	Labeling & Annotation	Governance
<ul style="list-style-type: none"> <li>DATAPRACTICES.ORG</li> <li>Incubating</li> <li>OpenDS4All</li> <li>Incubating</li> </ul>	<ul style="list-style-type: none"> <li>OpenBytes</li> <li>Sandbox</li> <li>Open Dataology</li> <li>Sandbox</li> <li>OpenLineage</li> <li>Sandbox</li> </ul>	<ul style="list-style-type: none"> <li>CouchDB</li> <li>MySQL</li> <li>KV</li> </ul>	<ul style="list-style-type: none"> <li>Milvus</li> <li>Graduated</li> <li>JanusGraph</li> <li>Incubating</li> <li>docarray</li> <li>Sandbox</li> <li>ALLUXIO</li> <li>ICEBERG</li> <li>ORC</li> <li>ARESDB</li> <li>ARROW</li> <li>AVRO</li> <li>CEPH</li> <li>DELTA LAKE</li> <li>DRUID</li> <li>HUDI</li> <li>HugeGraph</li> <li>INFLUXDB</li> <li>PANDAS</li> <li>PARQUET</li> <li>PILOSA</li> <li>VEARCH</li> <li>VESPA</li> <li>VINEYARD</li> </ul>	<ul style="list-style-type: none"> <li>datascience dashboard</li> <li>DVC</li> <li>OULIT</li> </ul>	<ul style="list-style-type: none"> <li>Amundsen</li> <li>Incubating</li> <li>datashim</li> <li>Incubating</li> <li>MARQUEZ</li> <li>Incubating</li> <li>HIVE</li> <li>Data Hub</li> <li>snortel</li> <li>WHYLABS whylogs</li> </ul>	<ul style="list-style-type: none"> <li>FEAST</li> <li>Incubating</li> <li>feathr</li> <li>Sandbox</li> <li>Featuretools</li> <li>OpenML3</li> <li>tsfresh</li> </ul>	<ul style="list-style-type: none"> <li>NNStreamer</li> <li>Incubating</li> <li>Flink</li> <li>fluentd</li> <li>Kafka</li> <li>logstash</li> <li>Pravega</li> <li>PREFECT</li> <li>PULSAR</li> <li>samza</li> <li>Uber uReplicator</li> </ul>	<ul style="list-style-type: none"> <li>APACHE DRILL</li> <li>HAWQ</li> <li>SQLFlow</li> <li>trino</li> <li>presto</li> <li>Google Facets</li> <li>Prometheus</li> <li>NYU scobion</li> <li>bakeh</li> <li>plotly Dash</li> <li>Uber deck.gl</li> <li>Ecco</li> <li>Google Grafana</li> <li>RCloud</li> <li>re dash</li> <li>Superset</li> <li>Google TensorBoard</li> </ul>	<ul style="list-style-type: none"> <li>Artigraph</li> <li>Sandbox</li> <li>Analytics Zoo</li> <li>DAGSTER</li> <li>PIFlow</li> <li>TEKTON</li> <li>TPOT</li> </ul>	<ul style="list-style-type: none"> <li>CVAT</li> <li>Doccano</li> <li>Labelbox</li> <li>LabelImg</li> <li>HITACHI Inspire the Next</li> <li>Microsoft VOT</li> </ul>	<ul style="list-style-type: none"> <li>EGERIA</li> <li>Graduated</li> <li>IBM Open License Agreement</li> </ul>	

**Model**

Inference	Federated Learning	Training	Parameter	Format & Interface	Marketplace	Workflow	Benchmarking	Tool	Explainability	Adversarial	Bias & Fairness
<ul style="list-style-type: none"> <li>ADLIK</li> <li>Incubating</li> <li>KServe</li> <li>Incubating</li> <li>CloudfML</li> <li>MNN</li> <li>NVIDIA TensorRT</li> <li>NVIDIA TensorRT Inference Server</li> <li>uTensor</li> </ul>	<ul style="list-style-type: none"> <li>FATE</li> <li>Incubating</li> <li>SUBSTRA</li> <li>Incubating</li> <li>Intel OpenFL</li> <li>PySyft</li> <li>TensorFlow Federated</li> </ul>	<ul style="list-style-type: none"> <li>KOROVOD</li> <li>Graduated</li> <li>LEWIG</li> <li>Incubating</li> <li>Microsoft Federated Learning Library</li> <li>Petastorm</li> <li>TorchRec</li> </ul>	<ul style="list-style-type: none"> <li>HYPERSCRIPT</li> <li>Katib</li> <li>talos</li> <li>Uber NeuroPod</li> </ul>	<ul style="list-style-type: none"> <li>ONNX</li> <li>Graduated</li> </ul>	<ul style="list-style-type: none"> <li>Machine Learning exchange</li> <li>Sandbox</li> <li>Acumos</li> <li>Archived</li> <li>IBM</li> </ul>	<ul style="list-style-type: none"> <li>Flyte</li> <li>Graduated</li> <li>Kedro</li> <li>Incubating</li> <li>BENTONML</li> <li>Cadence</li> <li>Couler</li> <li>CYCLONE</li> <li>DataBolt dflow</li> <li>kestra</li> <li>Spotify luigi</li> <li>mleap</li> <li>Orchest</li> <li>PREFECT</li> <li>TRAINS</li> <li>solomo</li> <li>Airflow</li> <li>nifi</li> <li>argo</li> <li>Azkan</li> <li>MLPerf</li> </ul>	<ul style="list-style-type: none"> <li>FlagAI 迅雷</li> <li>Sandbox</li> <li>Qualcomm AIMET</li> <li>FACEBOOK dirm</li> <li>FLAML</li> <li>Microsoft MMON</li> <li>aws MMS</li> <li>amazon Neo-AI</li> <li>NETRON</li> <li>ONNX RUNTIME</li> <li>PipelineAI</li> <li>studio.ml</li> <li>Google TensorFlow Model Analysis</li> <li>aws TorchServe</li> <li>turi</li> </ul>	<ul style="list-style-type: none"> <li>AI Explainability 360</li> <li>Incubating</li> <li>Microsoft InterpretML</li> <li>UNIVERSITY OF WASHINGTON Lime</li> <li>Google Lucid</li> <li>SHAP</li> <li>SKATER</li> <li>TreeInterpreter</li> <li>ALIBI</li> <li>ELIS</li> </ul>	<ul style="list-style-type: none"> <li>Adversarial Robustness Toolbox</li> <li>Graduated</li> <li>AdvBox</li> <li>adver torch</li> <li>cleverhans</li> <li>UNIVERSITY OF TORONTO Footbox</li> </ul>	<ul style="list-style-type: none"> <li>AI Fairness 360</li> <li>Incubating</li> <li>Aequitas</li> <li>Audit AI</li> <li>Standard University DeepFP</li> <li>Fairlearn</li> </ul>	

**Distributed Computing**

Computing & Management	Interface	Security & Privacy	Natural Language Processing	Notebook Environment
<ul style="list-style-type: none"> <li>EDL Elastic Deep Learning</li> <li>Incubating</li> <li>SOAJS</li> <li>Incubating</li> <li>Spark</li> <li>STORM</li> <li>GNSS</li> <li>NETFLIX genie</li> <li>GraphScope</li> <li>kubernetes</li> <li>Intel Nauta</li> <li>OPENSIFT</li> <li>Singularity</li> </ul>	<ul style="list-style-type: none"> <li>sparklyr</li> <li>Incubating</li> <li>APACHE TOREE</li> <li>LOVY</li> </ul>	<ul style="list-style-type: none"> <li>Google Differential Privacy</li> <li>HElib</li> <li>Microsoft SEAL</li> <li>Google TensorFlow Privacy</li> <li>TF Encrypted</li> </ul>	<ul style="list-style-type: none"> <li>DELTA</li> <li>Incubating</li> <li>RosaeNLG</li> <li>Sandbox</li> <li>Google ALBERT</li> <li>AllenNLP</li> <li>CoreNLP</li> <li>fastText</li> <li>flair</li> <li>LUON</li> <li>Kashgari</li> <li>FACEBOOK LASER</li> <li>mindmeld</li> <li>intel NLP Architect</li> <li>NLP</li> <li>ParIAI</li> <li>FACEBOOK PyText</li> <li>RASA</li> <li>spaCy</li> <li>Transformers</li> <li>FACEBOOK XLM</li> <li>YouTokenToMe</li> </ul>	<ul style="list-style-type: none"> <li>Elyra</li> <li>Sandbox</li> <li>colab</li> <li>IP[y]: IPython</li> <li>jupyter</li> <li>IBM</li> <li>Polynote</li> <li>Stencila</li> <li>Streamlit</li> <li>BeakerX</li> <li>Aspose Zepplin</li> <li>BeakerX</li> <li>IBM</li> <li>Microsoft</li> </ul>



The LF AI & Data landscape explores open source projects in Artificial Intelligence and Data and their respective domains.

[lfaidata.foundation](http://lfaidata.foundation)

**LF AI & DATA Landscape**

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