How Linux Foundation is Changing the (Machine-Learning) World

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Chairperson, LFDL Technical Advisory Council

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Build and support an open AI community, and drive open source innovation in the AI, ML and DL domains by enabling collaboration and the creation of new opportunities for all the members of the community.
## LFDL goals

<table>
<thead>
<tr>
<th>Neutral Environment</th>
<th>Harmonization, Interoperability</th>
<th>Ethics and Fairness</th>
<th>Data, Models Tools and Marketplace</th>
<th>Funding and Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a <strong>neutral environment</strong> and an <strong>open governance</strong> that fosters <strong>collaboration</strong> and cross-pollination</td>
<td>Increase efforts to <strong>harmonize</strong> open source projects and <strong>reduce fragmentation</strong>; increase the <strong>interoperability</strong> among projects</td>
<td>Become the <strong>home</strong> of open source AI efforts in <strong>ethics and fairness</strong>, and an <strong>advocate</strong> for these principles</td>
<td>Host open source AI models with supporting tools; publish best practices; offer a <strong>marketplace</strong> for <strong>machine learning Models</strong></td>
<td>Provide a <strong>funding</strong> model for <strong>key projects</strong>; increase awareness of LF DL projects</td>
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Governance

Single funding to support multiple technical projects

Technical projects have their own technical governance
LFDL structure

Governing Board

Outreach

Legal

Budget

Fairness

Technical Advisory Council (TAC)

Acumos

EDL

Angel

Horovod

Pyro

Technical Projects

Developer Community

Developer Community

Developer Community

Developer Community

Developer Community
Technical Advisory Council (TAC)

Membership

Coordination role:

- Facilities **communication across** and among the supported **technical projects**
- **Communicates needs and requirements** of the projects to the **Governing Board**
- **Onboards new projects**, assists in progression of existing projects, and reviews projects annually
- **Vote on approving new projects** joining the LF DL as incubation or graduate projects
- Defines and maintains the technical **vision** for the LF DL Foundation
- Creates the **landscape** and a **conceptual architecture** for the projects
- Defines **common practices** to be implemented across LF DL projects
- **Meetings** every 2 weeks, meetings are recorded and open to the general public
- [https://lists.deeplearningfoundation.org/g/tac-general/wiki/Home](https://lists.deeplearningfoundation.org/g/tac-general/wiki/Home)
Membership

Premier

- amdocs
- AT&T
- Baidu
- Ericsson
- HUAWEI
- NOKIA
- Tech Mahindra
- Tencent
- ZTE

General

- BYOND
- Ciena
- DiDi
- Intel
- orange
- redhat
- UNIVA

Associate
# Year in review

## Major milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>LFDL launches LF DL welcomes Acumos AI, its first project</td>
</tr>
<tr>
<td>05</td>
<td>Acumos AI Day France</td>
</tr>
<tr>
<td>06</td>
<td>LFDL welcomes Acumos Challenge</td>
</tr>
<tr>
<td>07</td>
<td>LF DL Contribution Process and Project Lifecycle</td>
</tr>
<tr>
<td>08</td>
<td>Acumos AI Day NYC</td>
</tr>
<tr>
<td>11</td>
<td>Acumos AI “Athena” Release</td>
</tr>
<tr>
<td>12</td>
<td>LFDL welcomes Horovod</td>
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<tr>
<td>01</td>
<td>LFDL welcomes Pyro</td>
</tr>
<tr>
<td>02</td>
<td>Getting Involved Guide</td>
</tr>
<tr>
<td>03</td>
<td>Mission</td>
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The goal is to be able to build a complete AI stack with LFDL hosted projects that are tightly integrated.
Acumos AI

GitHub: https://github.com/acumos
3K+ commits, 69 contributors,
38 committers
License: Apache-2.0
Description:

Acumos AI is a distributed marketplace for ML models, that makes it easy to build, share, and deploy AI apps. Acumos standardizes the infrastructure stack and components required to run an out-of-the-box general AI environment. This frees data scientists and model trainers to focus on their core competencies and accelerates innovation.
Acumos platform

1. Create & On-Board Models
   - Model designed in different ML frameworks / languages
   - Model

2. Enhancing Model with Application Data Sets
   - Data Sources
   - Training Dataset
   - Training / Testing Lifecycle
   - Executable
   - Predictor

3. Sharing Models in Marketplace
   - Search
   - Review
   - Chaining
   - Rating

4. Execute in Target Environment
   - Runtime Systems
   - Docker Images
   - Local Learning Testing

Data Sources, Data Lakes, Data Router
Train, Onboard, Deploy, Publish
Angel

GitHub: https://github.com/Angel-ML/angel
>1,800 commits, 33 contributors
License: Apache-2.0
Description:
Angel is a high-performance distributed machine-learning platform based on Parameter Server, running on YARN and Apache Spark. It is tuned for performance with big data/model and has a wide range of applicability and stability, demonstrating increasing advantage in handling higher dimension model. Angel supports big and complex models with billions of parameters.
EDL – Elastic Deep Learning

GitHub: https://github.com/paddlepaddle/edl
~1,000 commits, 15 contributors
License: Apache-2.0
Description:
EDL is an Elastic Deep Learning framework designed to help Deep Learning Cloud Service providers to build cluster cloud services using different deep learning frameworks.
Horovod

GitHub: https://github.com/horovod/horovod
~260 commits, 41 contributors
License: Apache-2.0

Description:
Horovod is a distributed training framework for TensorFlow, Keras, PyTorch, and MXNet. The goal of Horovod is to make distributed Deep Learning fast and easy to use.
Pyro

GitHub: https://github.com/pyro-ppl/pyro

~1,500 commits, 53 contributors

License: Apache-2.0

Description:
Pyro is a flexible, scalable deep probabilistic programming library built on PyTorch
## LFDL projects in an ML workflow

| Data collection, pre-processing, preparation | ML/DL Libraries and Programming Languages | Training and Evaluate Models | Productionize, and Deploy | Serving | ... |

![Logos](image-url)
We’ve added several dozens of projects since launch in Dec. 2018

Please open a pull request to correct any issues or add new projects

https://github.com/LFDLFoundation/lfdl-landscape
Thanks You

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