Meeting of the Technical Advisory Council (TAC)

December 17, 2020

LF AI & DATA

Anti-Trust Policy

› Linux Foundation meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.

› Examples of types of actions that are prohibited at Linux Foundation meetings and in connection with Linux Foundation activities are described in the Linux Foundation Antitrust Policy available at http://www.linuxfoundation.org/antitrust-policy. If you have questions about these matters, please contact your company counsel, or if you are a member of the Linux Foundation, feel free to contact Andrew Updegrove of the firm of Gesmer Undergone LLP, which provides legal counsel to the Linux Foundation.

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Recording of Calls

Reminder:

TAC calls are recorded and available for viewing on the [TAC Wiki](#)

LF AI & DATA

Reminder: LF AI & Data Useful Links

› Web site: lfaidata.foundation
› Wiki: wiki.lfaidata.foundation
› GitHub: github.com/lfaidata
› Landscape: https://landscape.lfaidata.foundation or https://l.lfaidata.foundation
› Mail Lists: https://lists.lfaidata.foundation
› Slack: https://slack.lfaidata.foundation
›
› LF AI Logos: https://github.com/lfaidata/artwork/tree/master/lfaidata
› LF AI Presentation Template:
  https://drive.google.com/file/d/1eiDNJvXCqSZHT4Zk_-czASIz2GTBRZk2/view?usp=sharing
›
› Events Page on LF AI Website: https://lfaidata.foundation/events/
› Events Calendar on LF AI Wiki (subscribe available):
  https://wiki.lfaidata.foundation/pages/viewpage.action?pageId=12091544
› Event Wiki Pages: https://wiki.lfaidata.foundation/display/DL/LF+AI+Data+Foundation+Events

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Agenda

- › Roll Call (2 mins)
- › Approval of Minutes (2 mins)
- › Project Graduation Proposal + Q&A + TAC Vote (25 minutes)
  - › Pyro (Fritz Obermeyer)
- › Invited Presentation (15 minutes)
  - › XPrize (Amir Banifatemi, Andrew Tauhert)
- › Invited Presentation (10 minutes)
  - › IT Update on new security services (Vasu Naidu, Shubhra Kar, Pranab)
- › LF AI General Updates (3 minutes)
- › Open Discussion (3 minutes)

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TAC Voting Members

* = still need backup specified on [wiki](#)

Board Member	Contact Person	Email
AT&T	Anwar Atfab	anwar@research.att.com
Baidu	Ti Zhou	zhouti@baidu.com
Ericsson	Rani Yadav-Ranjan*	rani.yadav-ranjan@ericsson.com
Huawei	Huang Zhipeng*	huangzhipeng@huawei.com
IBM	Susan Malaika	malaika@us.ibm.com
Nokia	Jonne Soininen*	jonne.soininen@nokia.com
SAS	Nancy Rausch	nancy.rausch@sas.com
Tech Mahindra	Nikunj Nirmal	nn006444@techmahindra.com
Tencent	Bruce Tao	brucetao@tencent.com
Zilliz	Jun Gu	jun.gu@zilliz.com
ZTE	Wei Meng	meng.wei2@zte.com.cn
Graduate Project	Contact Person	Email
Acumos	Nat Subramanian	natarajan.subramanian@techmahindra.com
Angel	Bruce Tao	brucetao@tencent.com
Egeria	Mandy Chessell	mandy_chessell@uk.ibm.com
Horovod	Travis Addair*	taddair@uber.com
ONNX	Jim Spohrer (Chair of TAC)	spohrer@us.ibm.com

Approval of December 3rd, 2020 Minutes

Draft minutes from the December 3rd TAC call were previously distributed to the TAC members via the mailing list

Proposed Resolution:

> › That the minutes of the December 3rd meeting of the Technical Advisory Council of the LF AI & Data Foundation are hereby approved.

Project Graduation Proposal - Pyro

LF AI & DATA

Project Graduation Proposal Review/Discussion/Vote: Pyro

Open source universal probabilistic programming language

Pyro is a universal probabilistic programming language (PPL) written in Python and supported by PyTorch on the backend. Pyro enables flexible and expressive deep probabilistic modeling, unifying the best of modern deep learning and Bayesian modeling.

Presenter: Fritz Obermeyer, Pyro Project Lead

Resources:
Github: https://github.com/pyro-ppl/pyro
LF AI & Data website: https://lfaidata.foundation/projects/pyro/
Project Level Request to TAC: Graduation

LF AI & DATA

Pyro LFAI Update 2020 & Request for Graduation

Fritz Obermeyer, Pyro Project Lead

@fritzo

Adoption

6.6k stars (Dec 2020)

795 forks

used by **323** repos

cited by **264** research papers

Technical Steering Committee

3 members at Broad Institute

2 members at Facebook

1 member at Twitter

1 member at UIUC

Biweekly meetings + Biweekly reading group

Communicate on: Pyro slack, PyTorch slack, public forum, github

Announce releases on: twitter, PyTorch slack

Graduation Progress

- **Contributors**
  - 101+ contributors
  - Used by Uber, IBM, Siemens, Apple, UnitedHealth Group, Broad Institute, Robinhood, Babylon Health, Northeastern, Columbia, UIUC, ...
- **Best Practices**
  - Core Infrastructure Initiative Best Practices Badge since 2019
- **Commits**
  - 2146 commits averaging about 6.5 per week in 2020
- **Governance and Procedures**
  - Added Technical Steering Committee members from Facebook, Twitter, Broad Institute, UIUC
  - Documentation for Contributor Guide, Charter, TSC, and CoC

Top Contributors (on one repo, since LFAI started tracking metrics)
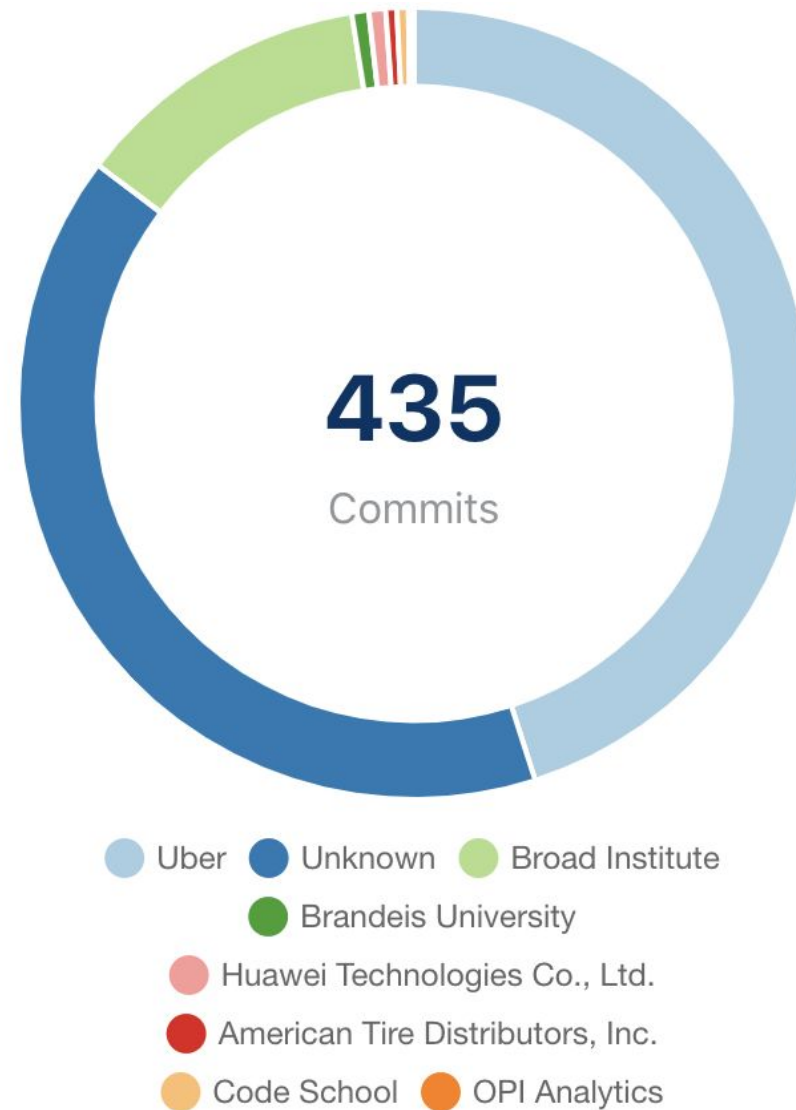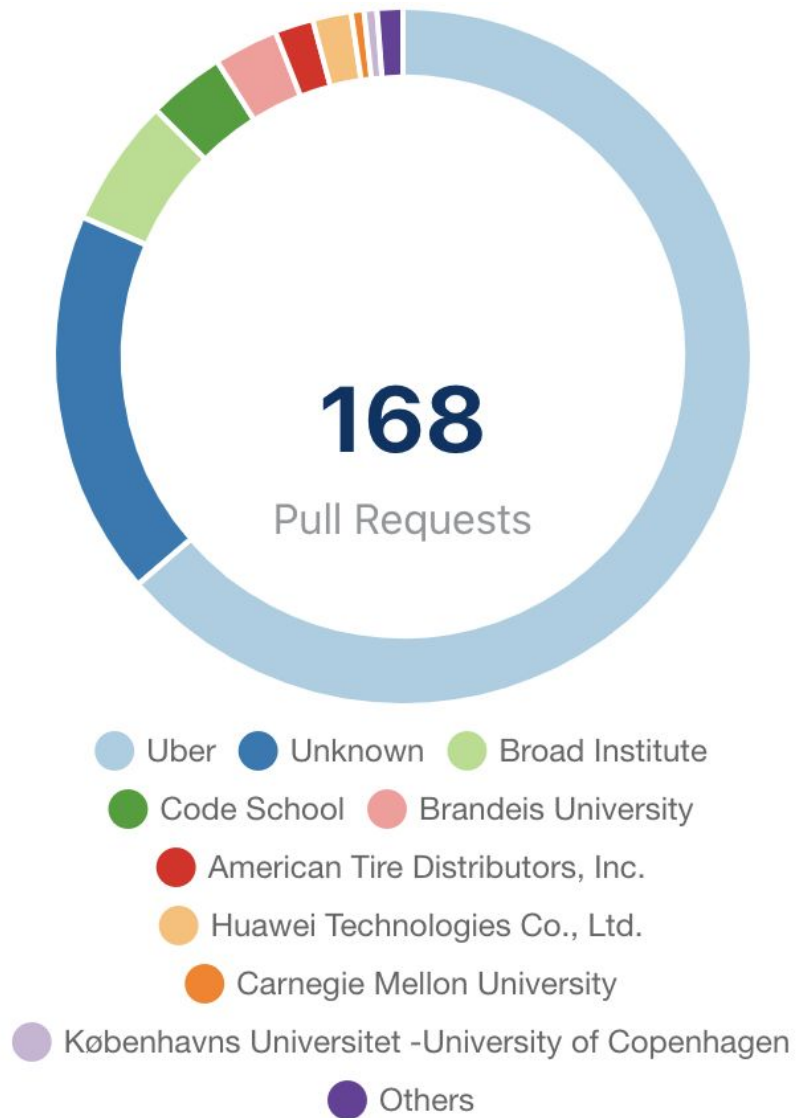
168
Pull Requests

- Uber
- Unknown
- Broad Institute
- Code School
- Brandeis University
- American Tire Distributors, Inc.
- Huawei Technologies Co., Ltd.
- Carnegie Mellon University
- Københavns Universitet -University of Copenhagen
- Others

435
Commits

- Uber
- Unknown
- Broad Institute
- Brandeis University
- Huawei Technologies Co., Ltd.
- American Tire Distributors, Inc.
- Code School
- OPI Analytics

Best Practices Badge

https://bestpractices.coreinfrastructure.org/en/projects/3056
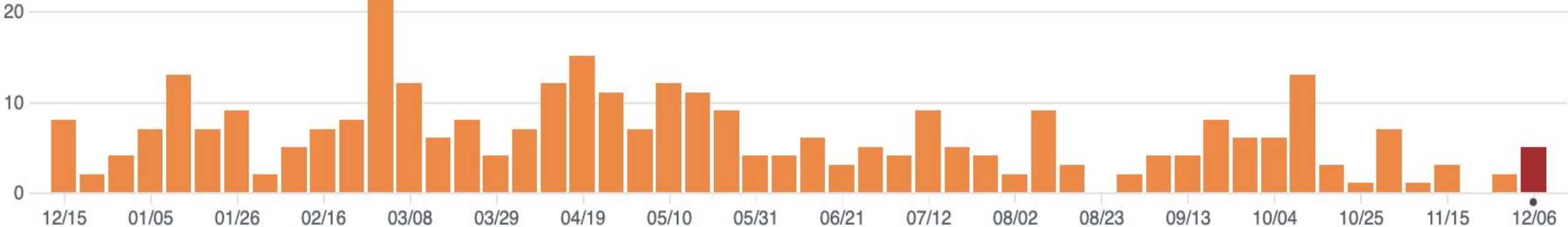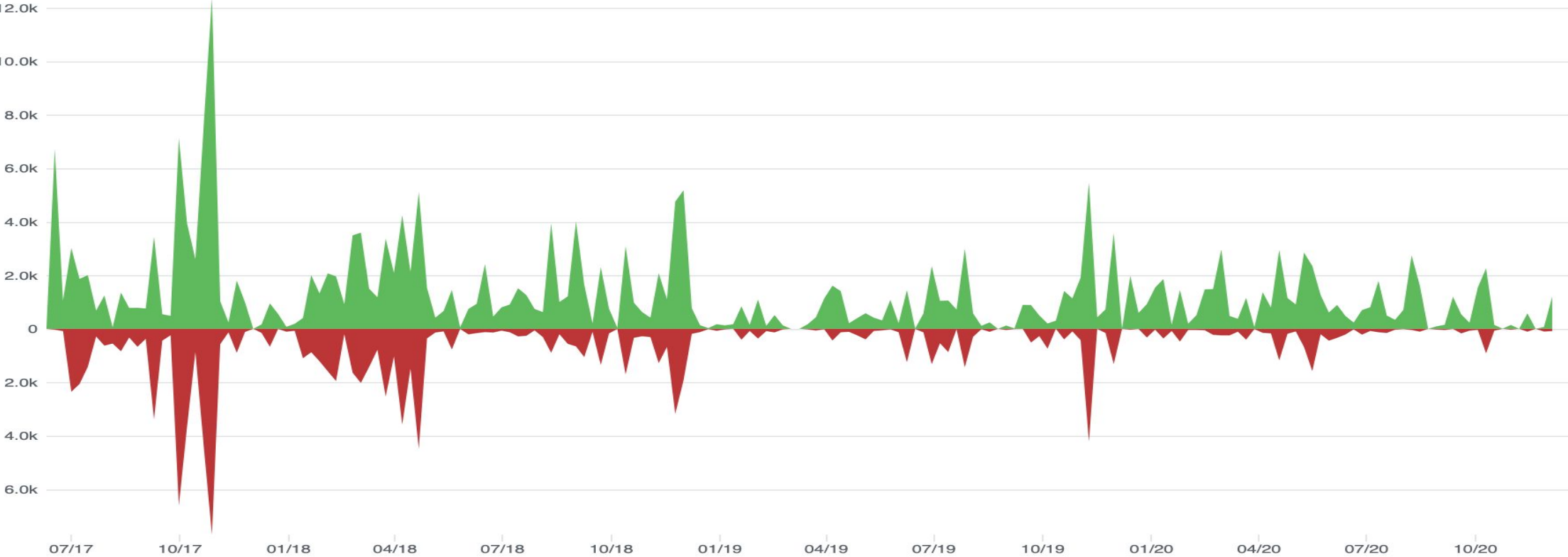
Commits

Governance and Procedures

- Contributors Guide
  - https://github.com/pyro-ppl/pyro/blob/dev/CONTRIBUTING.md
- Code of Conduct
  - https://github.com/pyro-ppl/pyro/blob/dev/CODE_OF_CONDUCT.md
- Governance Information
  - https://github.com/pyro-ppl/community
  - Includes:
    - Charter
    - Code Owners
    - Technical Steering Committee

2020 Roadmap - Completed

- Reparametrization effects, based on (Gorinova et al. 2019)
- pyro.contrib.forecast
- pyro.contrib.epidemiology
- AutoGuide improvements: AutoNormal, subsampling, pyro.subsample
- Support for heavy-tailed Levy stable distributions
- Additional normalizing flows
- Boosted BBVI
- Horovod integration
- Funsor backend (towards Pyro 2.0)
- Tutorials:
  - Forecasting
  - Normalizing Flows
  - Dirichlet Process Mixture Models
  - PyroModule
  - Epidemiology
  - MAP/MLE inference
  - Single cell sequencing
  - Conditional VAE

2021 Roadmap - Upcoming

- Collapsed inference via poutine.collapse (via Funsor integration)

- New MCMC algorithms

- Vectorized Markov chains

- Stein Variational Inference

- Phylogenetic, phylogeographic models

- New tutorials focusing on Biotech applications

Summary

Pyro exceeds every graduation metric set for LF AI & Data graduating projects.

We have been in incubation for exactly two years and grew the project to become a strong player in the open source AI ecosystem.

We're ready for graduation!

Thank you.

https://pyro.ai

Pyro on Uber Eng Blog: https://eng.uber.com/pyro
Pyro for Biology on YouTube: https://youtu.be/H6BPgSiobYI

TAC Vote on Project Graduation Proposal: Pyro

Proposed Resolution:

The TAC approves the Pyro as an Graduation project of the LF AI & Data Foundation

Next Steps

The Governing Board will review the Pyro deck during their January call and we will have an agenda item for the board to vote on the graduation.

After a positive vote, LF AI & Data staff will work with Pyro team to announce the graduation and project promotion

LF AI & DATA

Invited Presentation - XPrize

Presenters-

- Amir Banifatemi amir.banifatemi@xprize.org,

- Andrew Tauhert andrew.tauhert@xprize.org

LF AI & DATA

A MORE HOPEFUL VISION

WHAT IS XPRIZE

The mission of XPRIZE is to inspire and empower humanity to achieve breakthroughs that accelerate a hopeful future for all.

OUR BEGINNING

ANSARI XPRIZE

The $10 million Ansari XPRIZE was designed to lower the risk and cost of going to space by incentivizing the creation of a reliable, reusable, privately financed, manned spaceship that finally made private space travel commercially viable.
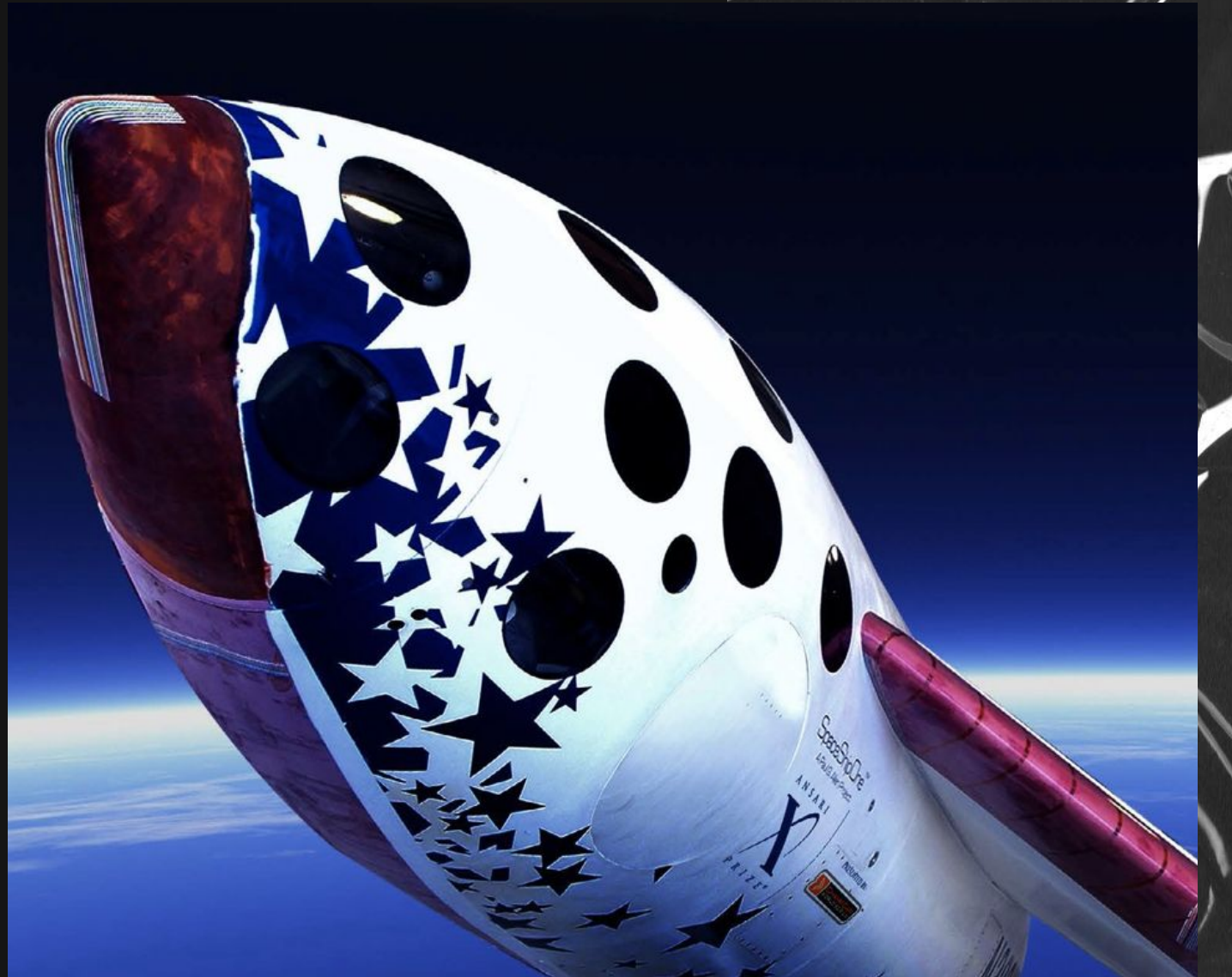
BUILDING ON A HISTORY OF IMPACT
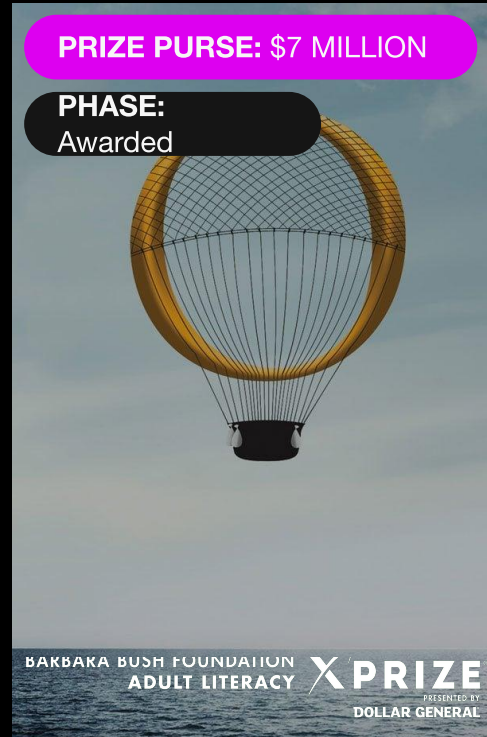
PRIZE PURSE: $15 MILLION

PHASE: Awarded

GLOBAL LEARNING XPRIZE

Challenged teams to develop open-source, scalable software that empowers children to teach themselves basic reading, writing and arithmetic within 15 months.
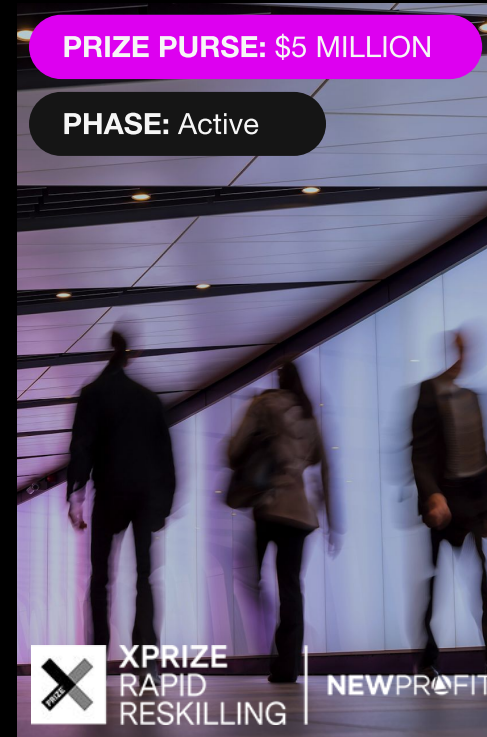
PRIZE PURSE: $7 MILLION

PHASE: Awarded

BARBARA BUSH FOUNDATION ADULT LITERACY XPRIZE
PRESENTED BY DOLLAR GENERAL

Global competition challenging teams to develop mobile applications for existing smart devices that result in the greatest increase in literacy skills among participating adult learners in just 12 months
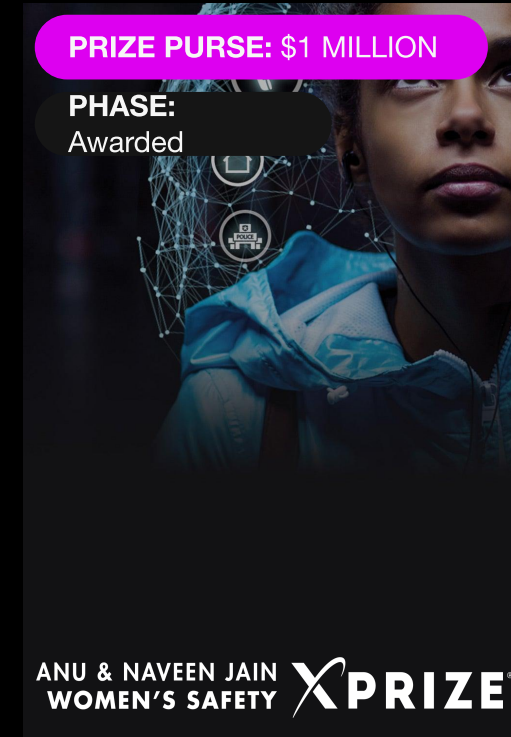
PRIZE PURSE: $5 MILLION

PHASE: Active

XPRIZE RAPID RESKILLING | NEWPROFIT

30-month competition to quickly reskill under-resourced workers for the digital revolution

PRIZE PURSE: $1 MILLION

PHASE: Awarded

ANU & NAVEEN JAIN WOMEN'S SAFETY XPRIZE

Global competition that challenges teams to leverage technology to empower communities with a transformative solution that ensures women's safety

BUILDING ON A HISTORY OF IMPACT

XPRIZE AI | IBM Watson

AI TO SOLVE GLOBAL ISSUES

The $5M IBM Watson AI XPRIZE challenges teams to demonstrate how humans can work with AI to tackle global challenges.

XPRIZE AVATAR | ANA

ANYWHERE IS POSSIBLE

The $10M ANA Avatar XPRIZE aims to create an avatar system that can transport human presence to a remote location in real time.

XPRIZE CARBON | nrg | cosia

TURNING CO_2 INTO PRODUCTS

The $20M NRG COSIA Carbon XPRIZE develops breakthrough technologies to convert CO_2 emissions into usable products.

HUMANITY'S GREATEST CHALLENGES WITH UNCOMMON THINKING & PARTNERSHIPS

XPRIZE®

OUR REACH AND IMPACT

$175M
Cumulative Prize Purses

20
Prizes Launched

1M+
Supporters Worldwide

$75M
Awarded Prizes

13
Awarded Prizes

200+
Partners

$300M
Prizes Currently In Development

15
Prizes in Development

40
Academic Alliance

WORKING ACROSS DOMAINS

1

EXPLORATION

2

ENVIRONMENT

3

HUMAN EQUITY
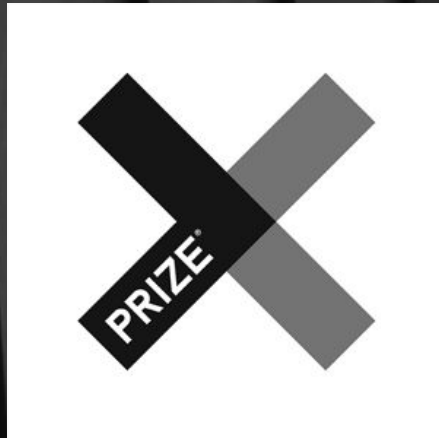
OPEN SCIENCE AND INTELLIGENCE PLATFORM

ACCELERATING BREAKTHROUGH INNOVATION

TO EMPOWER THE WORLD TO HARNESS DATA, COLLABORATION AND COLLECTIVE KNOWLEDGE TO ACCELERATE BREAKTHROUGHS THAT SOLVE THE WORLD'S GREATEST CHALLENGES

THE VISION

THE PROBLEM

TODAY'S ISSUES REQUIRE NEW WAYS TO SOLVE PROBLEMS

1

PROBLEMS ARE MORE COMPLEX & URGENT

The world is becoming increasingly smaller and intertwined, thus accelerating and magnifying the effects of any one local issue.

2

INNOVATION MUST BE EVIDENCE-BASED & SCALABLE

Increased production and availability of data has given rise to data-driven insights, but at the same time requires solutions to be scalable to sustain impact.

3

COLLABORATION DOESN'T COME EASY

Most companies are too narrow in how they think about collaboration, and thus face the inevitable challenge to compete on a global scale.

THE WORLD IN WHICH WE LIVE

OVERBURDENED HEALTHCARE SYSTEM

The US has experienced 5.5M cases, 20%+ of which were hospitalized, overwhelming the health system and its resources, thereby leading to additional unnecessary deaths.[1]

OBSERVED SPIKE IN MENTAL DEPRESSION

1,000% increase in the number of emotional distress incidents registered in April compared to same time last year by federal emergency mental health hotline.[2]

INCREASED ECONOMIC DISPARITY

Lower-income (23%) and people of color (22%) workers have been disproportionately unemployed from COVID-19 compared to upper-income (8%) and white workers (14%).[3]

DISRUPTED EDUCATION SYSTEM

Projected 50% of math learnings from prior academic year lost as a result of school closings from COVID and virtual learning environment, particularly in lower-income areas.[4]

COVID has highlighted several challenges and complexities in how the world approaches problems

[1]COVID Tracking Project + Statista, Centers for Disease Control, Covidtracking.org
[2]"The coronavirus pandemic is pushing America into a mental health crisis," Washington Post, May 4, 2020
[3]"How The Crisis Is Making Racial Inequality Worse," National Public Radio, May 26, 2020
[4]"The impact of COVID-19 on student achievement and what it may mean for educators," Brookings Institute, May 27, 2020

OPEN KNOWLEDGE

1

AGGREGATED DATA, MODELS, TOOLS AND RESOURCES

Democratize access to data, tools, and insights by creating a platform that allows public and private entities to share information, knowledge, and resources safely.
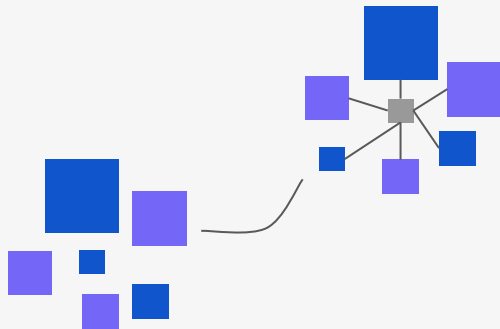
2

MOBILIZED COMMUNITY AROUND SPECIFIC ISSUES

Connect and convene an ecosystem of experts, problem solvers, doers and collaborators by mobilizing the ecosystem through hackathons and innovation challenges.
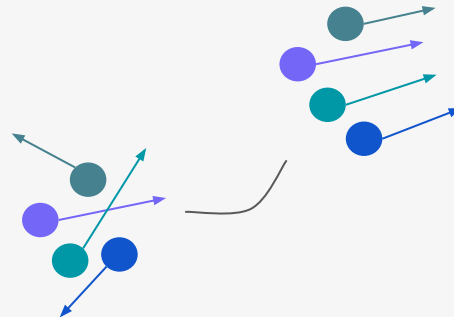
3

INTELLIGENT SOLUTIONS BUILT FOR MODULARITY & SCALE

Drive evidence-based solutions by creating a solution marketplace to allow innovators to build ideas, knowledge and solutions on-top of prior solutions.
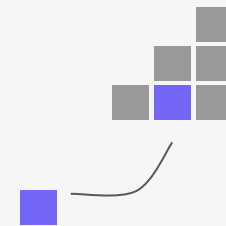
PANDEMIC
OPEN
ALLIANCE

PANDEMIC ALLIANCE PARTNERS

CORPORATE PARTNERS

IBM
SageBionetworks
illumina
Anthem.
IDEO
TAVISTOCK GROUP
SONSIEL
Society of Nurse Scientists Innovators Entrepreneurs & Leaders
NVIDIA
INCREDIBLE HEALTH
IMMUTA
HUMA
xy.ai
CognitiveScale
VALE
Global Gene Corp
CATALYTIC
C2
esri
McKESSON
Empowering Healthcare
Life Sciences Queensland
ELEMENT AI
techstars_
江苏省产业技术研究院
JIANGSU INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE
Munich RE
AMERICAN IMPACT CAPITAL
FOUNDATION
CLOUDBREAK
MAGNA

GOVERNMENT/NGO PARTNERS

Patrick J McGovern FOUNDATION
IEEE
fondation BOTNAR
Ending Pandemics
VA U.S. Department of Veterans Affairs
ITU
C19 COALITION
unicef
SOLVE
YPO

UNIVERSITY PARTNERS

EINSTEIN
Albert Einstein College of Medicine
MIT
SZOIL
SHENZHEN OPEN INNOVATION LAB
深圳开放创新实验室
UNIVERSITY OF GEORGIA
BOSTON UNIVERSITY
ARTHUR C CLARKE CENTER FOR HUMAN IMAGINATION
USC University of Southern California
جامعة خليفة Khalifa University
McGill
UCIrvine
UCLA
THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC
UNT UNIVERSITY OF NORTH TEXAS
HARVARD BUSINESS SCHOOL

XPRIZE

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APRIL 2020 - NOVEMBER 2020

437
ALLIANCE OPPORTUNITIES

289
COVID19 SOLUTIONS PRESENTED

18
PROJECTS INITIATED

6
COMPETITIONS LAUNCHED

20
TASK FORCE MEMBERS

25M+
IN PRIZE PURSES

80+
XPA PARTNERS

CHALLENGES + PRIZES LAUNCHED

WORK REIMAGINED
XPRIZE RAPID RESKILLING | NEWPROFIT

NEXT-GEN MASK CHALLENGE
XPRIZE PANDEMIC ALLIANCE

SIMPLE. FAST. FREQUENT.
XPRIZE RAPID COVID TESTING

PANDEMIC RESPONSE CHALLENGE
PHASE Recruitment
XPRIZE
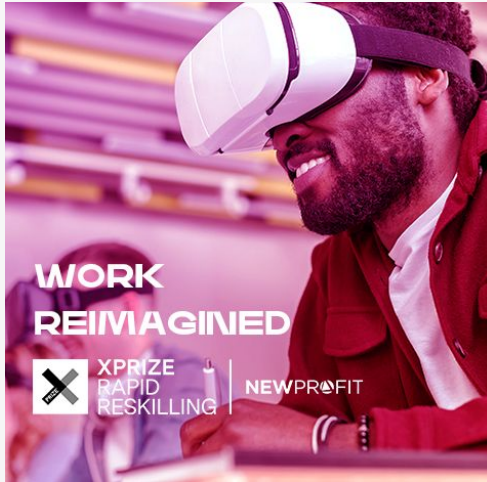
XPRIZE RAPID RESKILLING

$5 million dollar, 30-month competition to quickly reskill under-resourced workers for the digital revolution.

NEXT-GEN MASK CHALLENGE

$1 million dollar, 8-month challenge aims to reimagine protective face masks used to prevent the spread of COVID-19 by making them more comfortable, functional, accessible, and even stylish.

XPRIZE RAPID COVID TESTING

$5 million dollar, 6-month competition to develop faster, cheaper, and easier to use COVID-19 testing methods at scale. The world needs more high-quality, affordable & frequent testing to safely re-open.
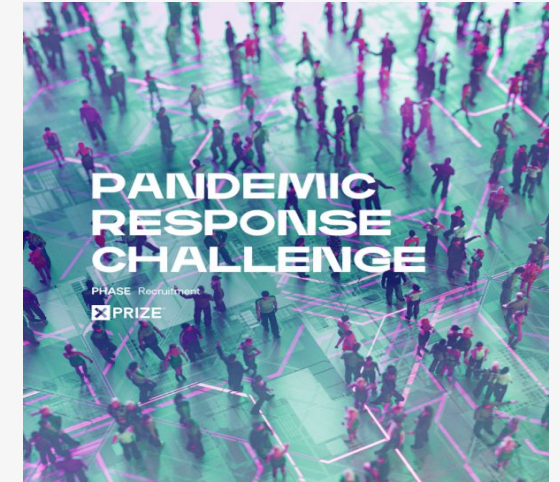
PANDEMIC RESPONSE CHALLENGE

A $500K, four-month challenge that focuses on the development of data-driven AI systems to predict COVID-19 infection rates and prescribe plans that regional decision makers can implement to minimize harm when reopening their economies.

PANDEMIC RESPONSE CHALLENGE

PHASE: Team Recruitment

11.17.20
LAUNCHED

$500K-$2M
TOTAL
PRIZE PURSE

366
PRE-REGISTERED
TEAMS

55
COUNTRIES
REPRESENTED

1.13.21
FINALISTS
ANNOUNCEMENT

02.26.21
WINNER
ANNOUNCEMENT
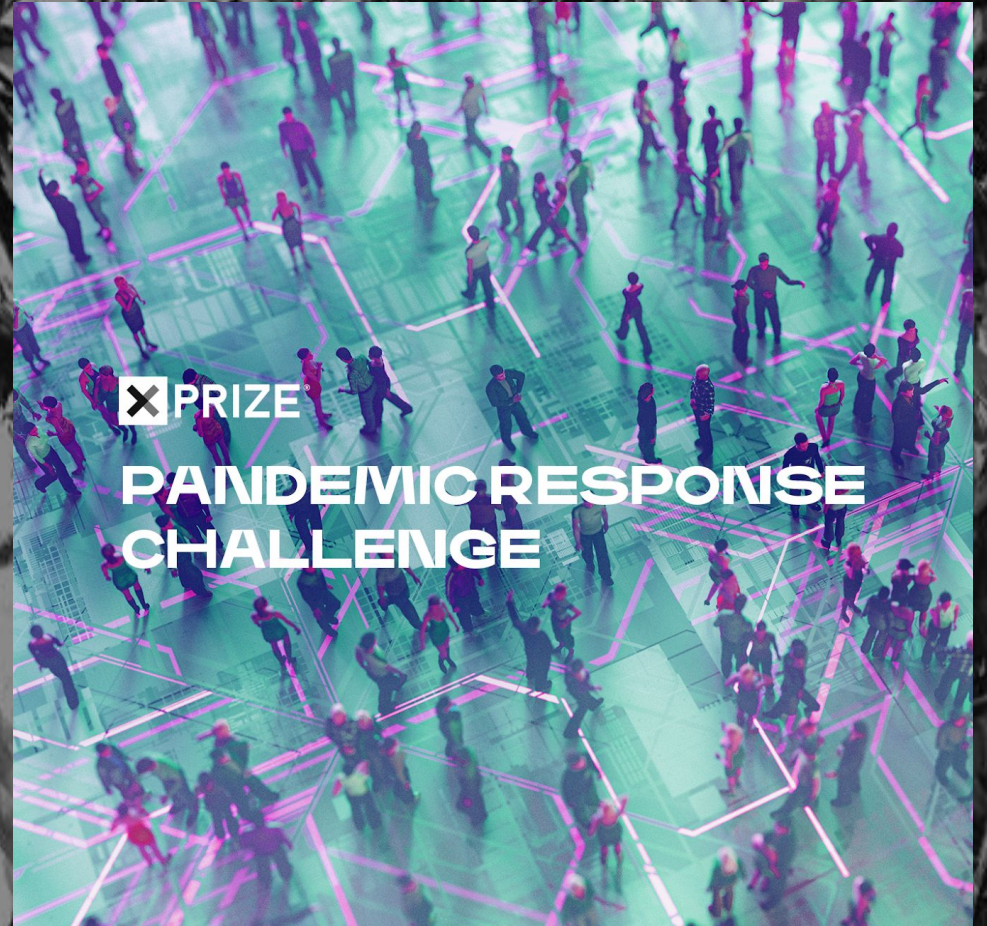
CHALLENGES IN DEVELOPMENT

AI-ENABLED RAPID DRUG DISCOVERY

This competition will challenge the drug discovery community to shorten the developmental timeline of new antiviral drugs for COVID-19 and future pandemics by performing trusted evaluation of AI-designed drug candidates in a distributed manner at an unprecedented scale.
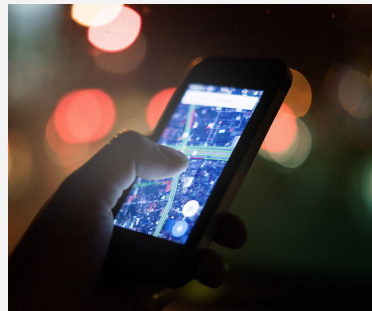
COMMUNITY HEALTH ASSESSMENT

This competition will incentivize regional teams to collaborate on the collection of longitudinal health assessment datasets that can be used to generate new insights and drive more effective community level decision making.

PLASMA COLLECTION CHALLENGE

Mobilizes diverse convalescent plasma donations with metadata collection, accelerating important discoveries in antibody-mediated therapies, and creating a set of donor-engagement tools that can be adopted by regional municipalities around the world to fight COVID-19 and future pandemics.

PANDEMIC ALLIANCE DATA COLLABORATIVE

➔ XPRIZE is committed to democratizing access to data and the tools to explore their potential, enabling virtually anyone, anywhere to make an impact - driving evidence based solutions and insights to the world's biggest challenges.

➔ We are leveraging this powerful collaboration platform in the fight against the COVID-19 Pandemic.

➔ Access it at: **https://data.xprize.org/covid19**

BUILT ON A TRUSTFUL DATA SHARING AND ACCESS APPROACH

➔ The Data Collaborative platform allows data to be shared while guaranteeing privacy, traceability, and transparency to enable data owners to maintain control of their data assets.

➔ Allows users to access a wide range of possible collaboration sandboxes and generating solution pathways and new services.

➔ The platform brings together a decentralized ecosystem of data, a trust framework, and includes machine learning & simulation tools, compute, storage, and services.

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DATASETS

The data repository allows users to explore and discover more about the datasets they think are relevant to solving problems/challenges. Summary info on each dataset includes: when the dataset was uploaded or most recently modified, access permissions, license, and references.
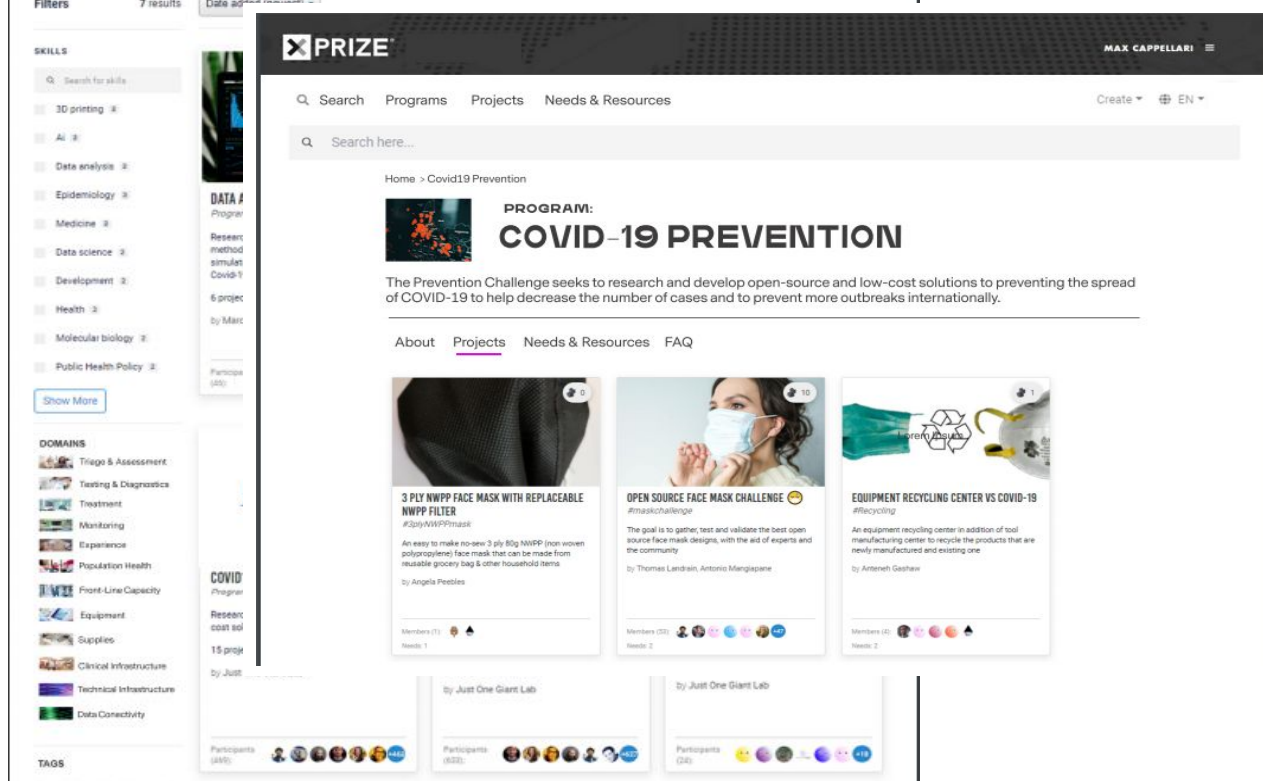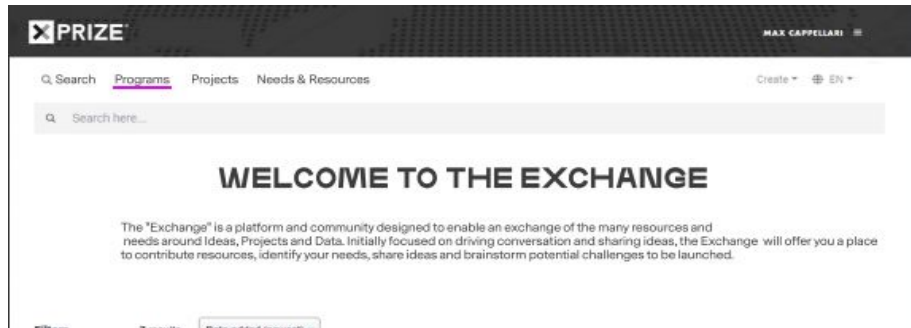
THE PANDEMIC MARKETPLACE

Enabling the Pandemic Alliance to organize its initiatives and resources - maximizing collaboration and exchange of these assets to maximize contribution & outcomes

1/4

P—46

THE PANDEMIC MARKETPLACE

Enabling the Pandemic Alliance to organize its initiatives and resources - maximizing collaboration and exchange of these assets to maximize contribution & outcomes
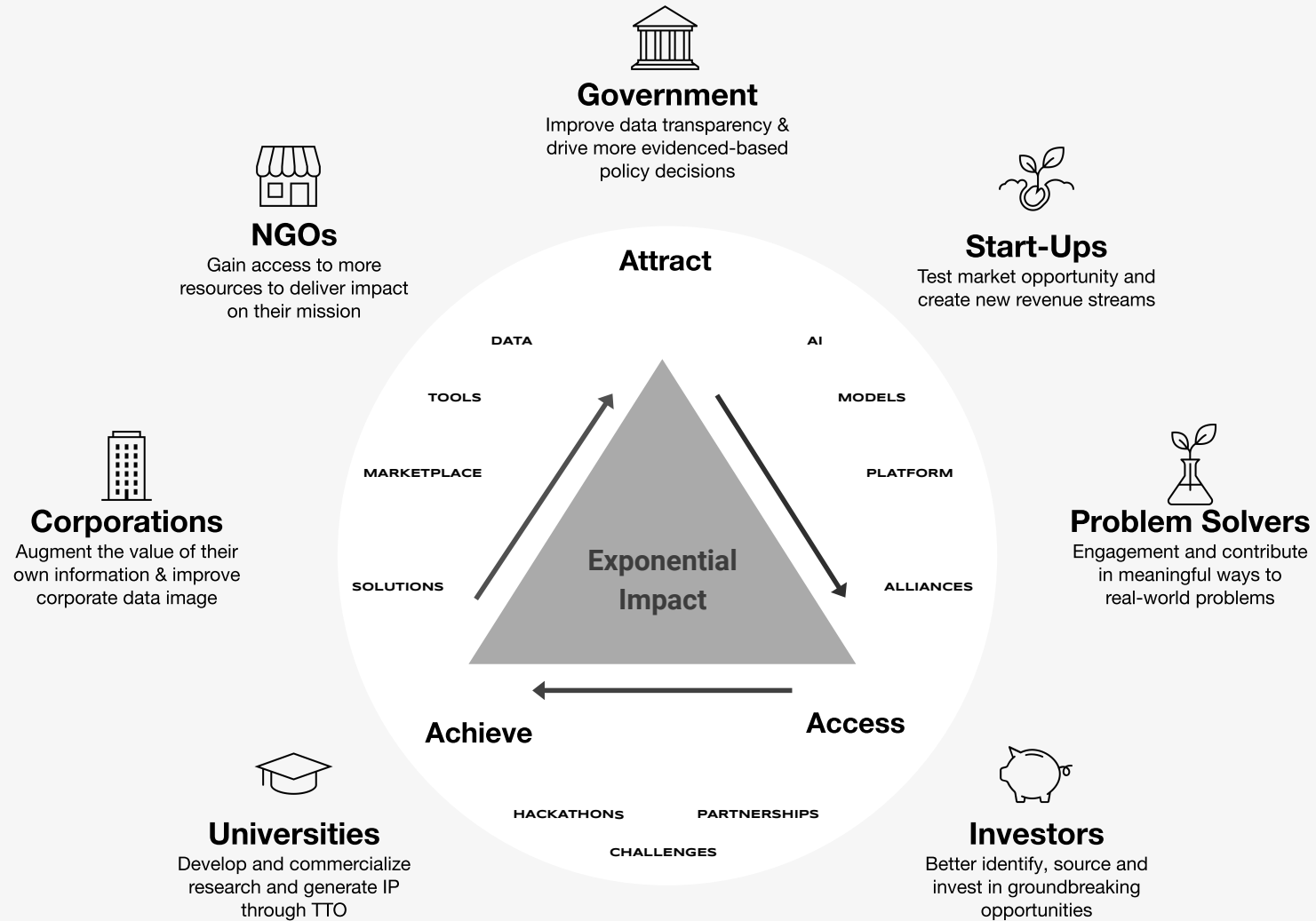
2/4

ENGAGE THROUGH DATA, AI & COLLABORATION

Government
Improve data transparency & drive more evidenced-based policy decisions

Start-Ups
Test market opportunity and create new revenue streams

NGOs
Gain access to more resources to deliver impact on their mission

Attract

DATA

AI

TOOLS

MODELS

MARKETPLACE

PLATFORM

Corporations
Augment the value of their own information & improve corporate data image

SOLUTIONS

Exponential Impact

ALLIANCES

Problem Solvers
Engagement and contribute in meaningful ways to real-world problems

Achieve

Access

Universities
Develop and commercialize research and generate IP through TTO

HACKATHONS

PARTNERSHIPS

CHALLENGES

Investors
Better identify, source and invest in groundbreaking opportunities

48

THANK YOU

Amir Banifatemi
amir@xprize.org

Invited Presentation -
IT Update on New security services

Presenters -

- Vasu Naidu

- Shubhara Kar

- Pranab

LF AI & DATA

LFX is a platform with tools for everyone, from core maintainers to community managers.

Let's explore the tools that will help articulate and amplify your project's momentum

Tools for **everyone**

THE LINUX FOUNDATION

⊓LFX

Insights	Security	Individual Dashboard	EasyCLA	Mentorship	Crowdfunding
Member Enrollment	Landscape	Community Events	Training Portal	Project Control Center	Organization Dashboard

Limited Access Beta Early 2021

LFX | Security

THE LINUX FOUNDATION

Open source security is a shared responsibility

Building trust with your community is key to project success.

LFX Security provides automated scanning to detect vulnerabilities and weaknesses, proposing fixes to help projects address top security concerns including…

1. We're worried that hackers will exploit our code, we need a way to identify and fix vulnerabilities quickly.
2. Our project isn't getting enterprise adoption, our code is struggling to pass security scans.
3. Exposure to IP risk is a top priority, but we aren't sure which upstream packages need to be switched to those with more acceptable licensing.
4. Our community needs to trust our code, it is critical that we give them complete transparency into our project's health.

10,334 Scanned Repositories	**263,499** Vulnerabilities Detected	**21,597** Recommended Fixes
13,802 Vulnerabilities Fixed		

LFX | Security

THE LINUX FOUNDATION

Security helps automatically detect potential vulnerabilities and suggests fixes

Build secure code from the start

Secure code means sustainable projects and increased enterprise adoption, so get it right the first time by making security part of your development process.

Automated vulnerability detection and fix recommendations make it easier to resolve security bugs without having to be a full-time expert. Demonstrate your commitment to security with a badge from the Core Infrastructure Initiative (CII).

Protect your open source investments

Protect against the risk of vulnerabilities in open source projects by verifying that the projects you depend on are secure. Identify how secure or enterprise-ready a project is with reports and badges.

Features

Centralized Project Security Dashboard
Monitor your entire project for potential vulnerabilities with an aggregated project-level view of your entire software sandwich across source control systems and repositories.

Automated Vulnerability Scanning
Stay up-to-date on project health with weekly checks against thousands of authorized open source repository vulnerability databases, bug bounties, security advisories, and security articles and reports.

Fix Recommendations
Resolve any detected vulnerabilities with CVE and CWE recommendations based on pull requests from others in the ecosystem.

License Compliance Management
Ensure project compliance by keeping track of all licenses used by your projects and their dependencies.

Contextual Vulnerability Reporting
Track potential vulnerabilities within the context of a holistic view that aggregates your project's 100s or 1000s of repositories.

Detailed Dependency Tree
Understand the relationships between local and upstream packages and identify the impact of vulnerabilities to your project.

Neutral to Source Control Systems
Security supports the most common SCMs including GitHub, Bitbucket, GitLab, Azure, and more.

Release Version Contextualization
Review potential vulnerabilities within the context of your project's code release schedule.
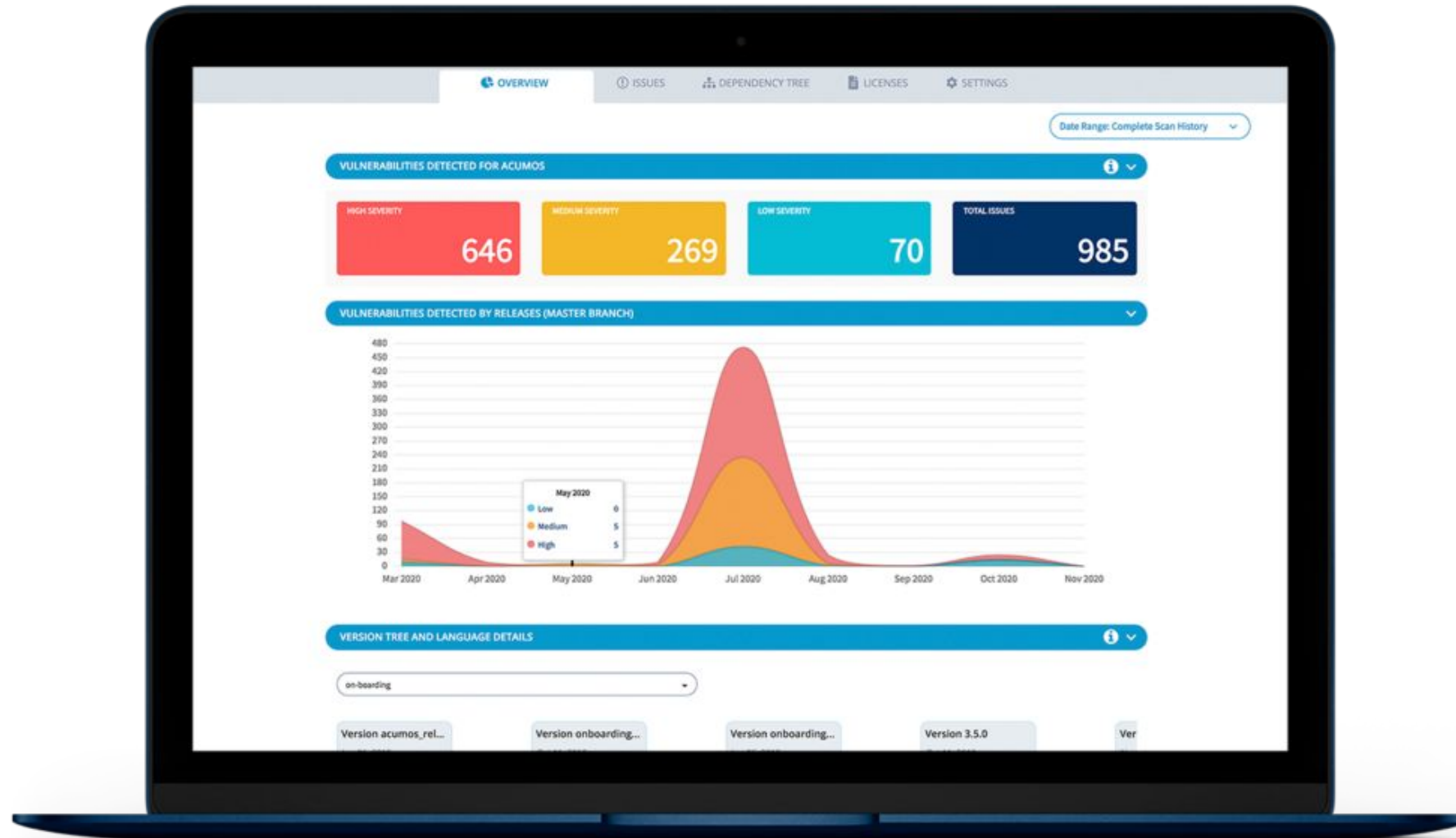
Security overview landing page
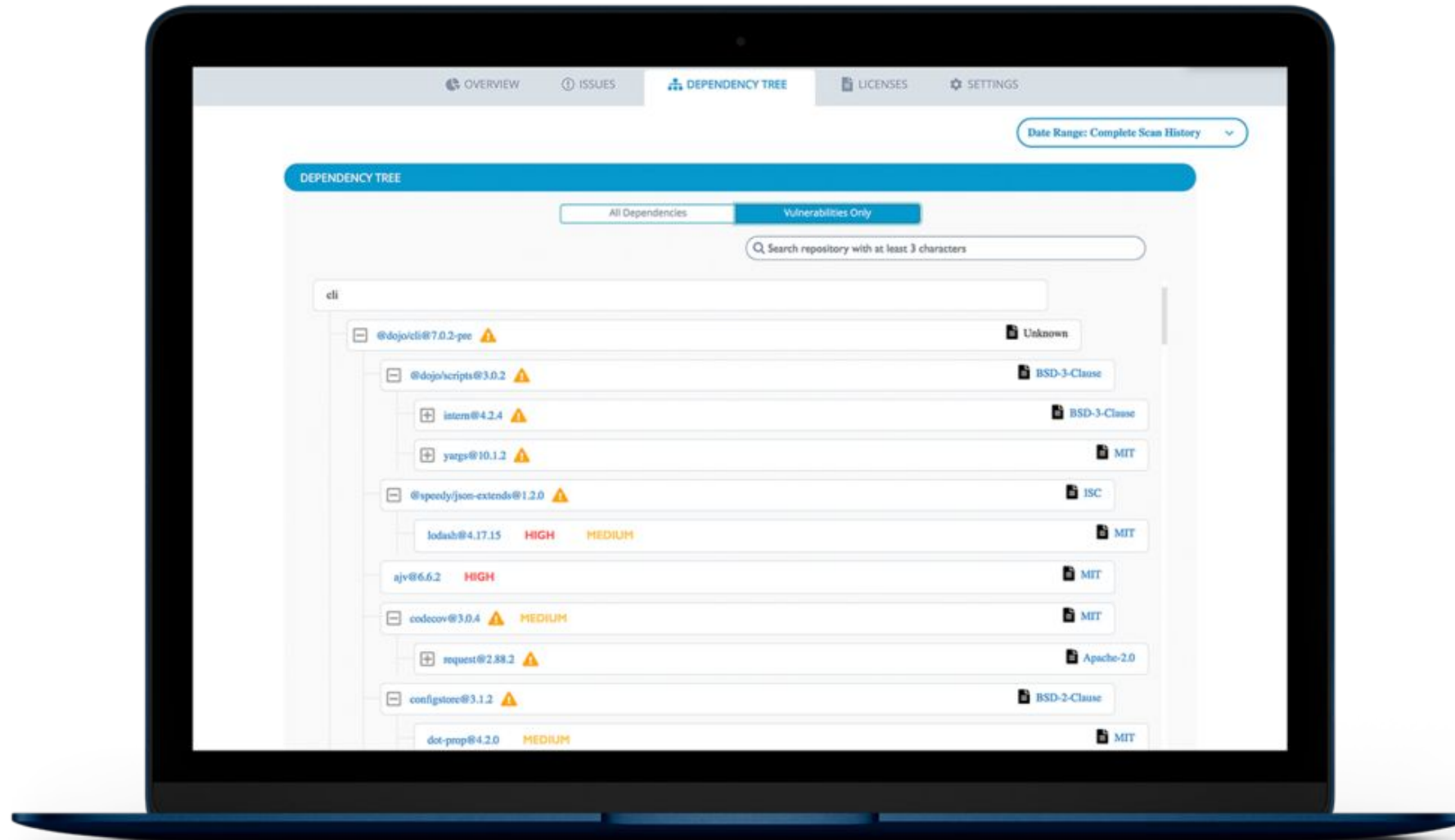
Package dependencies
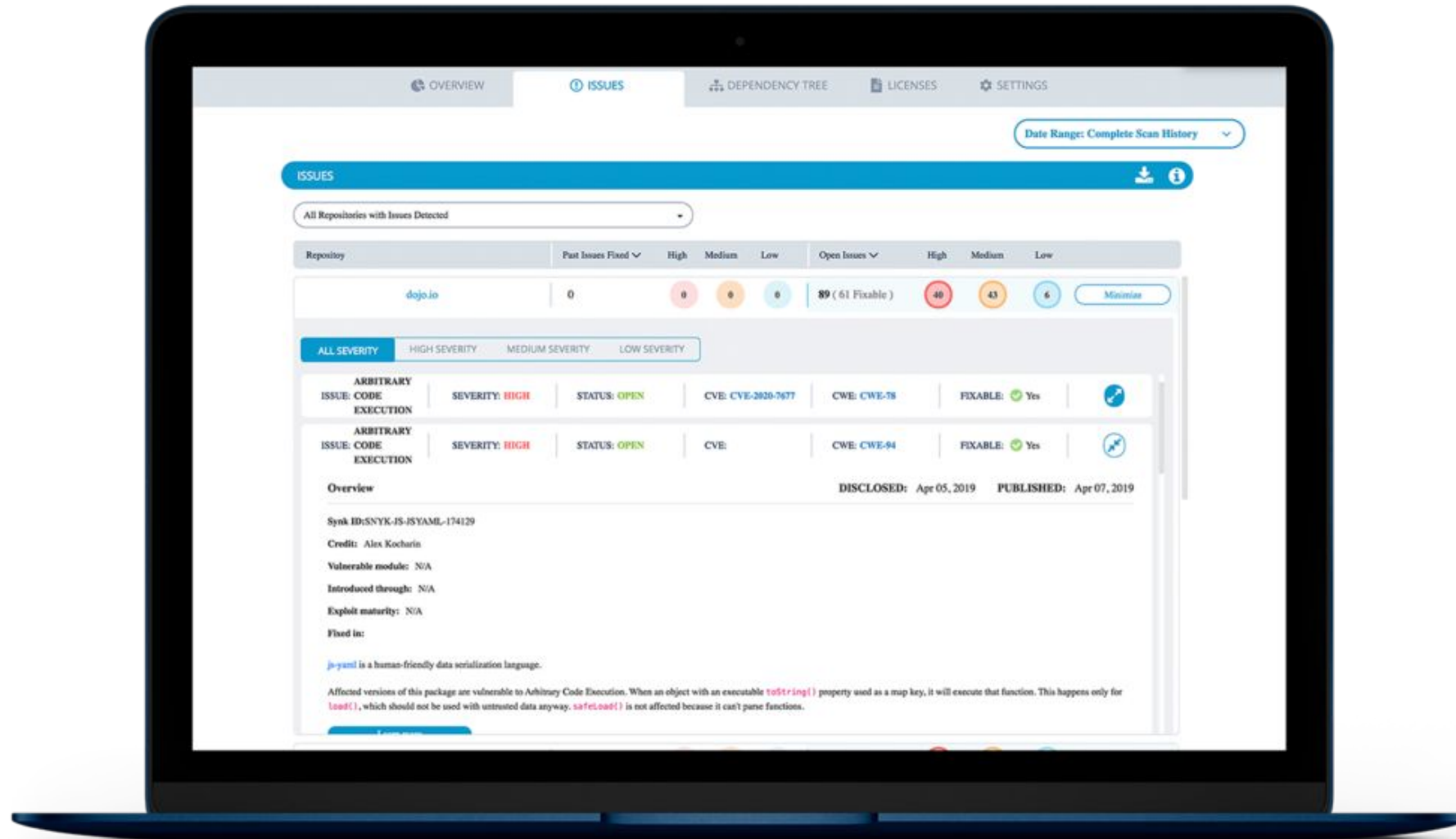
Vulnerability issue list

Demo

Roadmap

- **Code Secrets Scanning**
- **Software BOM policy management**
- **C and C++ support**
- **Static Code Analysis**

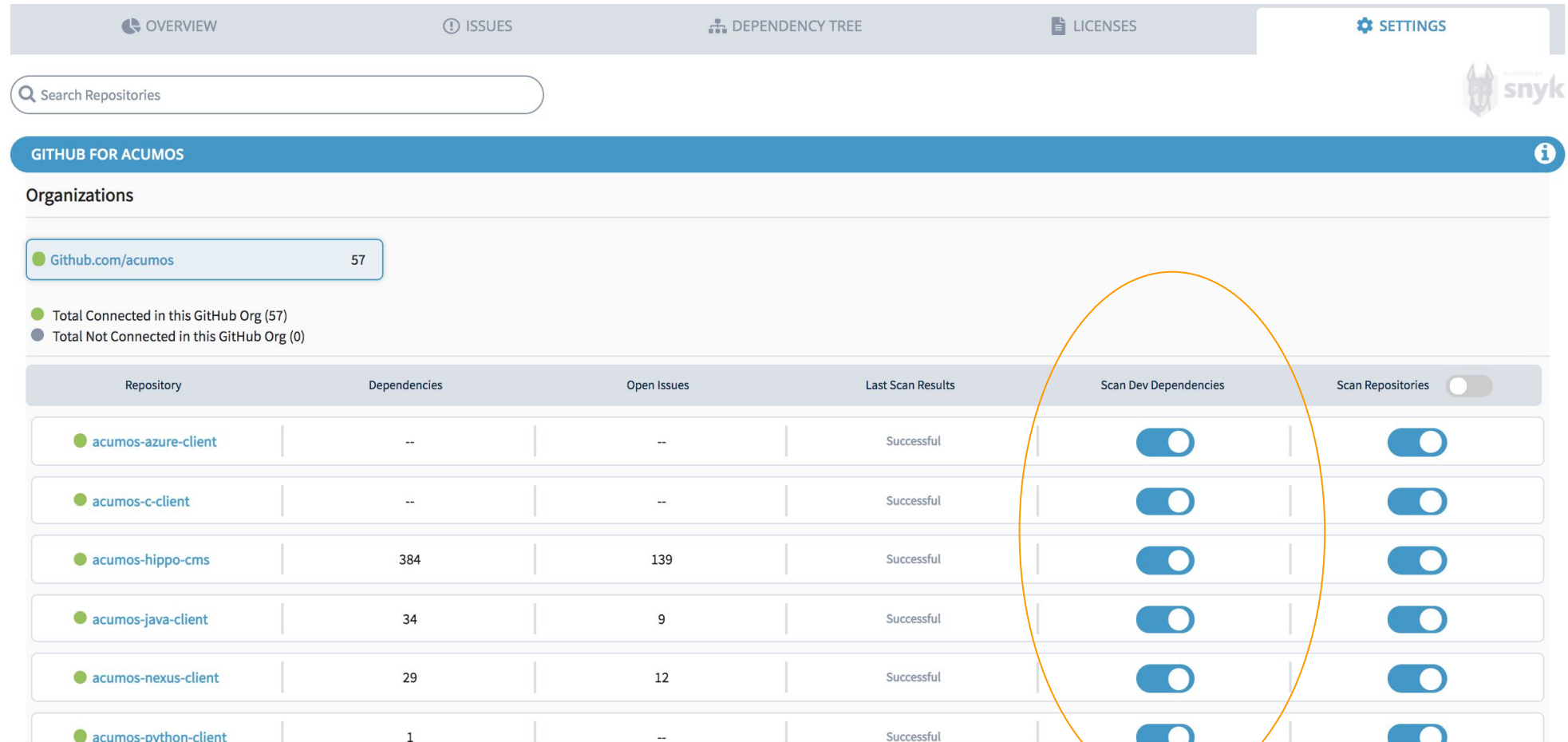CTAs for **LFAI and Data hosted projects**

- Consistent Manifest Creation
  - Sample Manifest: https://docs.google.com/document/d/1nYIAQ--Xk3hTkpeZ0NiAnhWk5rtTY_7HyY6GkdOKnsU/edit#heading=h.bk7nxo4dmpfl

List of repos which are failing scans. CTA is to create/update manifest files

1. Acumos - https://github.com/acumos/ci-management
2. Acumos - https://github.com/acumos/system-integration
3. Acumos - https://github.com/acumos/acumos-c-client
4. Pyro - https://github.com/pyro-ppl/sandbox
5. Pyro - https://github.com/pyro-ppl/pyro-api
6. Marquez - https://github.com/MarquezProject/marquez-airflow
7. Marquez - https://github.com/MarquezProject/marquez-airflow-quickstart
8. Adlik - https://github.com/Adlik/Adlik
9. Adlik - https://github.com/Adlik/model_optimizer
10. NNstreamer - https://github.com/nnstreamer/nntrainer
11. NNstreamer - https://github.com/nnstreamer/meta-neural-network
12. NNstreamer - https://github.com/nnstreamer/TAOS-CI
13. NNstreamer - https://github.com/nnstreamer/nnshark
14. Opends4all - https://github.com/odpi/OpenDS4All

- CTA: Turning on/off dev dependencies. Need maintainers to take decision

- Request Access for your project card

- Analyze the data and provide feedback: https://jira.linuxfoundation.org/plugins/servlet/theme/portal/4?q_time=1608133366050&q=Security
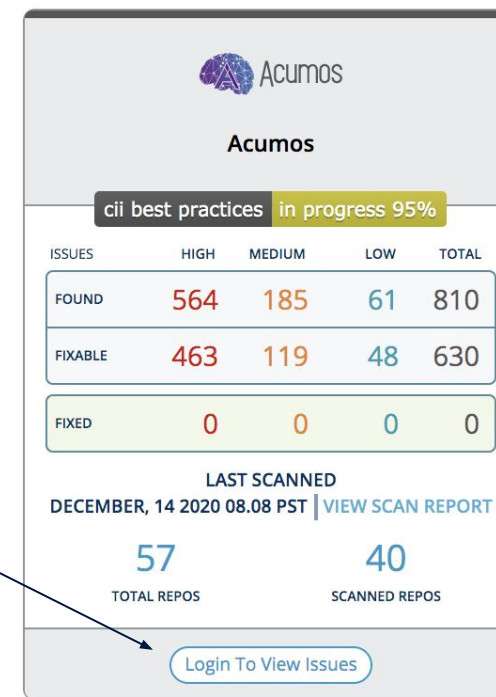
Get started with **LFX...**

Explore LFX: **lfx.dev**
Stay Connected: **lfx.dev/newsletter**
Get Support:**https://tinyurl.com/y7qngtwj**
Have Questions: **lfx.dev/questions**

LF AI & Data - General Updates

ㅁLF AI & DATA

Linux Foundation AI Landscape
2020-11-22T22:28:27Z b08f33f

See the interactive landscape at l.lfai.foundation

Greyed logos are not open source

Machine Learning

Framework	Platform	Library
Angel	ForestFlow	
LF AI & Data	LF AI & Data	

Deep Learning

Framework	Platform	Library	Tool

Reinforcement Learning

Reinforcement Learning

Programming

Pyro
LF AI & Data

Notebook Environment

Notebook Environment

Data

Versioning	Store & Format	Operations	Stream Processing	SQL Engine	Feature Engineering	Visualization	Pipeline Management	Labeling and Annotation	Governance
	Milvus	Amundsen / FEAST	NNStreamer						EGERIA
	LF AI & Data	LF AI & Data / LF AI & Data	LF AI & Data						LF AI & Data
		MARQUEZ							
		LF AI & Data Incubating							

Model

Benchmarking	Training	Parameter	Format & Interface	Marketplace	Workflow	Inference	Tool
HOROVOD	LUDWIG		ONNX	Acumos		ADLIK	
LF AI & Data	LF AI & Data		LF AI & Data	LF AI & Data		LF AI & Data	

Trusted & Responsible AI

Explainability	Adversarial	Bias & Fairness
AI Explainability 360	Adversarial Robustness Toolbox	AI Fairness 360
LF AI & Data	LF AI & Data	LF AI & Data

Distributed Computing

Computing & Management	Interface
EDL / SOAJS	sparklyr
Elastic Deep Learning	
LF AI & Data / LF AI & Data	LF AI & Data

l.lfaidata.foundation

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

LF AI & DATA Landscape

LF AI & DATA

Security & Privacy

Security & Privacy

Natural Language Processing

DELTA
LF AI & Data

Education

Education
DATAPRACTICES.ORG
LF AI & Data
OpenDS4All
LF AI & Data Incubating

Suggested Additions

Programming

Numpy
Numba
SciPy
Dask
Julia (*)
Python
Rstudio

Notebooks

Elyra
I-python
Jupyter Notebooks
PixieDust
Rmarkdown

Security & Privacy

HE-Lib (*)
TensorFlow Privacy
TF-Encrypted

Distributed Computing

Management
OpenShift
Kubernetes
Mesos
Ranger
Storm

Interface
Sparklyr
Toree
Livy
Spark-NLP

Data

Versioning
Pachyderm (*)

Store & Format
Alluxio
Arrow
Avro
Delta Lake (*)
Druid
JanusGraph
Parquet
Ceph

Stream Processing
Flink
Kafka
Logstash (*)
FluentD (*)

Relational DB
Postgres
MySQL
CouchDB

SQL Engine
Presto (*)

Visualization
Bokeh
D3
Plotly
Facets
Grafana
Seaborn
Superset (*)
TensorBoard
Prometheus

Data

Governance
Egeria
CLDA

Feature Engineering
Tsfresh

Operations
FEAST (*)
Amundsen (*)
Hive (*)
Snorkel (*)

Pipeline Management
Beam

Labeling & Annotation
Vott (*)

Exploration
Hue
Kibana

Machine Learning

Framework
LightGBM
Mahout
Ray (*)

Platform
Kubeflow
H2O
SystemML
Mlflow (*)
Seldon (*)
Marvin-AI (*)

Library
Scikit-learn
XGBoost
cat-boost
SparkML

Deep Learning

Framework
TensorFlow
PyTorch
MX-Net

Libarary
Keras

Reinforcement Learning

DeepMind Lab (*)
OpenAI Gym (*)

Model

Inference
TensorRT
TensorRT Inference

Benchmarking
MLPerf

Training
Horovod (*)

Parameter
HyperOpt
Katib

Format & Interface
ONNX

Marketplace
MAX (*)

Workflow
Kubeflow Pipelines
Tekton
Airflow (*)
Nifi (*)
Argp (*)
Mleap (*)
Volcano (*)

Tool
KFServing
ONNX Runtime
TorchServe (*)
Clipper (*)
MMS (*)

Trusted AI

Explainability
AI Explainability 360
Alibi (*)
LIME
SHAP

Bias & Fairness
AI Fairness 360

Adversarial Attacks
Adversarial Robustness Toolbox

Natural Language Processing

UIMA
BERT
Core NLP
Lucene
PyText
Spacy
Transformers (*)

Education

OpenDS4All

LF AI & DATA

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2020 TAC Meetings Summary

Months			
Jan Feb Mar	16: Milvus (Zilliz)*	*13: MLOps Work (LF CD)* *27: Collective Knowledge (Coral Reef)*	12: NNStreamer (Samsung)* 26: ForestFlow (?)*
Apr May Jun	*9: Trusted AI & ML Workflow (LF)* *23: Open Data Hub (Red Hat)*	7: Ludwig (Uber)* *21: SnapML (IBM)*	*4: Trusted AI (AI for Good, Ambianic.ai, MAIEI)* 18: Fairness, Explainability, Robustness (IBM)*
Jul Aug Sep	*16: Mindspore (Huawei)* 30: Amundsen (Lyft)*	*16: Delta (Didi)* **16: Horovod (Uber/LF)**** *30: ModelDB (?)* *30: Egeria, OpenDS4All, BI&AI (LF ODPi)*	10: SOAJS (HeronTech)* 10: Delta (Didi)* 24: FEAST (Gojek)* **24: Egeria, (LF ODPi)**** 24: OpenDS4All (ODPi)* 24: BI&AI Committee (ODPi)
Oct Nov Dec	*8: Fairness, Explainability, Robustness (LF)* *22: OpenLineage (DataKins)* *22: IDA (IBM/Salesforce)*	5: DataPractices.Org (WorldData/LF)* *5: Kubeflow-On-Prem (Google,Arrikto/Intel)* *19: OpenDS4All, DataPractices.Org, edX Ethical AI (LF)*	3: TBD - JanusGraph (LF)* *3: TBD - RosaeGL (?)* 17: TBD – Seldon Core (Seldon)* **17: TBD – Pyro (Uber/LF)****

(Entity)* = incubating vote   **** bold = graduate vote**   *Italics = invited project presentation*

2021 TAC Meetings Pipeline Summary

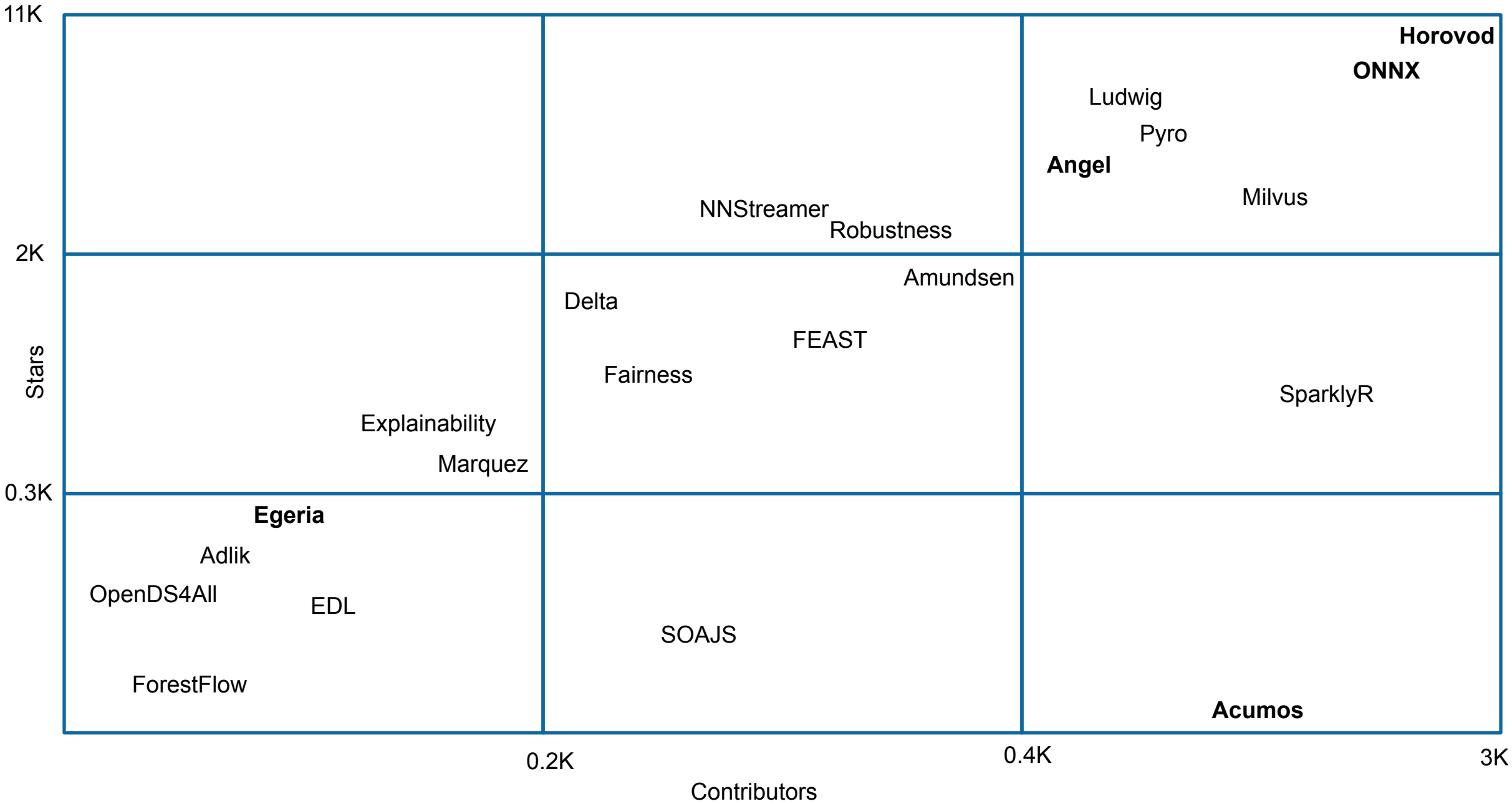| Months			
Jan Feb Mar	?: DataHub (LinkedIn)	?: Ray (Anyscale.io)	?: Couler (Ant Financial)
Apr May Jun	?: Kubeflow-On-Prem (Google, Arrikto, Intel)	?: Data Lifecyle Framework (IBM) ?: Pachyderm (Pachyderm)	?: Common Knowledge (Code Reef)
Jul Aug Sep	?: KubeflowServing (Google, Arrikto, Seldon)	?: Kubeflow Pipeline (Google, Bloomberg)	?: Open Data Hub (Red Hat)
Oct Nov Dec	?: Vespa (Verizon Media)	?: Snorkle (Snorkle) ?: Plotly (DASH) ?: Mellody (Substra) ?: mloperator (Polyaxen) ?: SnapML (IBM)	?: PMML/PFA (DMG.org) ?: Mindspore, Volcano (Huawei) ?: TransmorgrifAI (Salesforce) ?: AIMET (Qualcomm) ?: Elyra-AI (IBM)

(Entity)* = incubating vote   **** bold = graduate vote**   *Italics = invited project presentation*

Getting to know the projects more

LF AI & DATA

Data from November 23, 2020 – Stars and Contributors

11K

Horovod

ONNX

Ludwig

Pyro

Angel

Milvus

NNStreamer

Robustness

2K

Amundsen

Delta

FEAST

Fairness

Stars

SparklyR

Explainability

Marquez

0.3K

Egeria

Adlik

OpenDS4All

EDL

SOAJS

ForestFlow

Acumos

3K   0.2K   0.4K   3K

Contributors

Data from November 23, 2020 – Lines of Code and Commits

- Lines (y-axis): 1000K, 100K, 40K
- Commits (x-axis): 1K, 5K, 20K

SOAJS
Acumos
Egeria
Milvus
ONNX
Angel
NNStreamer
Amundsen
Pyro
OpenDS4All
SparklyR
Marquez
Delta
FEAST
Horovod
Robustness
Ludwig
Adlik
EDL
Fairness
ForestFlow
Explainability

75
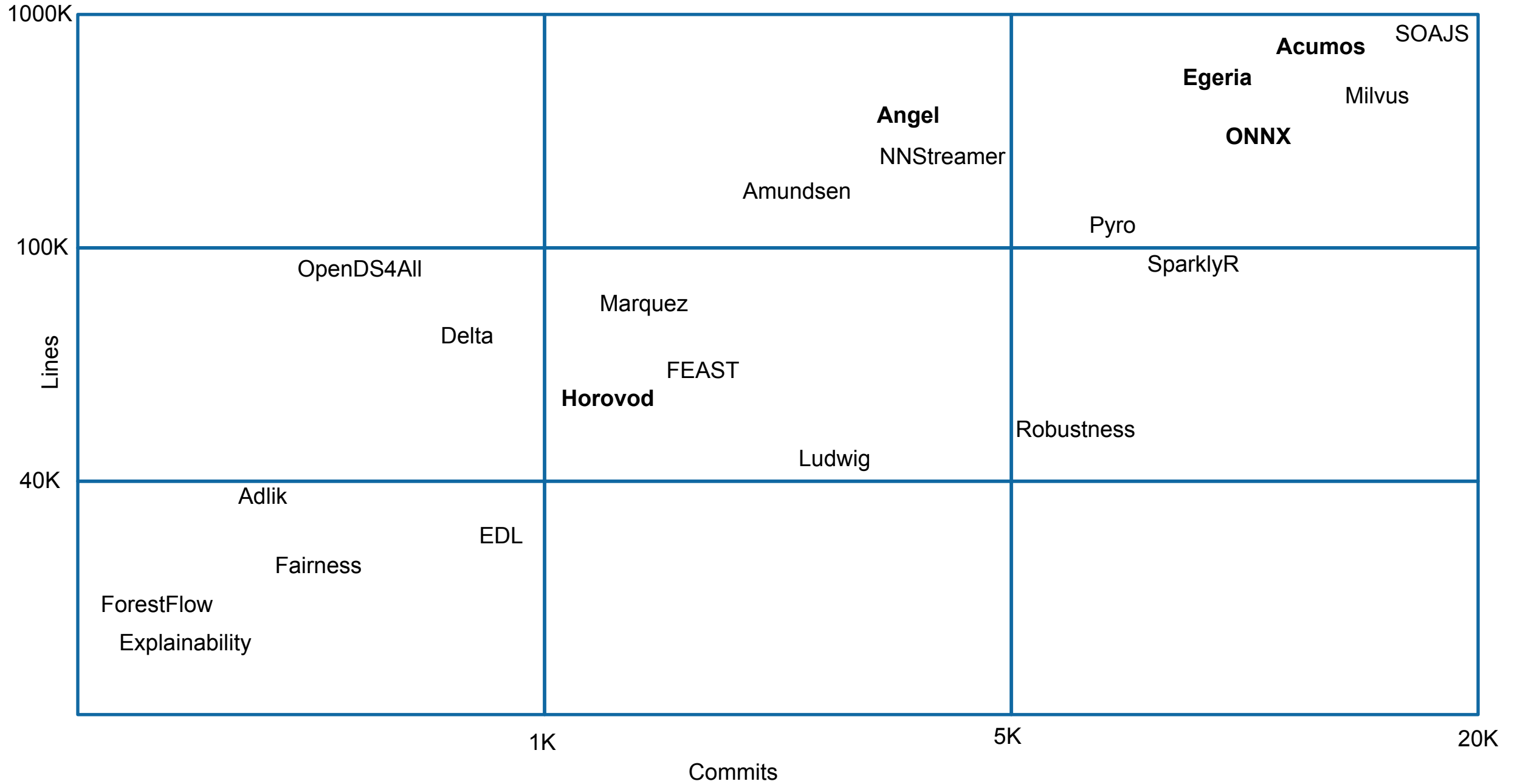
Looking to host a project with LF AI & Data

› Hosted project stages and life cycle:
https://lfaidata.foundation/project-stages-and-lifecycle/

› Offered services for hosted projects:
https://lfaidata.foundation/services-for-projects/

› Contact:
Jim Spohrer (TAC Chair) and Ibrahim Haddad (ED, LF AI & Data)

Promoting Upcoming Project Releases

We promote project releases via a blog post and on LF AI & Data [Twitter](#) and/or [LinkedIn](#) social channels

For links to details on upcoming releases for LF AI & Data hosted projects visit the [Technical Project Releases wiki](#)

If you are an LF AI & Data hosted project and would like LF AI & Data to promote your release, reach out to pr@lfai.foundation to coordinate in advance (min 2 wks) of your expected release date.

LF AI & DATA

Note on quorum

As LF AI & Data is growing, we now have 16 voting members on the TAC.

TAC representative - please ensure you attend the bi-weekly calls or email Jacqueline/Ibrahim to designate an alternate representative when you can not make it.

We need to ensure quorum on the calls especially when we have items to vote on.

LF AI & DATA

Updates from Outreach Committee

LF AI & DATA

Upcoming Events

› Upcoming Events
  › Visit the LF AI & Data Events Calendar or the LF AI & Data 2020 Events wiki for a list of all events
  › To participate visit the LF AI & Data 2020 Events wiki page or email info@lfaidata.foundation

› Please consider holding virtual events

To discuss participation, please email events@lfaidata.foundation

LF AI & DATA

Upcoming Events

- **Upcoming Events - https://lfaidata.foundation/events/**
  - a. **LF AI Day: ONNX Community Virtual Meetup – March 2021**
    March 24, 2021 @ 5:00 pm - 8:00 pm PT USA
    (Asia-friendly time – Host Ti Zhou - Baidu)
  - b. **LF AI & Data Booth at Open Source Summit North America – August 4 – 6, 2021**
- **Recent Events**
  - a. **AI/ML/DL presented by LF AI Foundation" Track at OSS Japan – Dec 2-4**

LF AI & DATA

LF AI PR/Comms

› Please follow LF AI & Data on [Twitter](#) & [LinkedIn](#) and help amplify news via your social networks - Please retweet and share!

  › Also watch for news updates via the tac-general mail list
  › View recent announcement on the [LF AI & Data Blog](#)

› Open call to publish project/committee updates or other relevant content on the [LF AI & Data Blog](#)

› To discuss more details on participation or upcoming announcements, please email pr@lfaidata.foundation

LF AI & DATA

Call to Participate in Ongoing Efforts

LF AI & DATA

Trusted AI

- › **Leadership:**
  Animesh Singh (IBM), Souad Ouali (Orange), and Jeff Cao (Tencent)
- › **Goal:** Create policies, guidelines, tooling and use cases by industry

- › **Slack conversation channel:**
  #trusted-ai-committee
  https://lfaifoundation.slack.com/archives/CPS6Q1E8G
- › **Github:**
  https://github.com/lfai/trusted-ai
- › **Wiki:**
  https://wiki.lfai.foundation/display/DL/Trusted+AI+Committee
- › **Email lists:**
  https://lists.lfaidata.foundation/g/trustedai-committee/
- › **Next call:** Monthly alternating times
  https://wiki.lfai.foundation/pages/viewpage.action?pageId=12091895

ML Workflow & Interop

- › **Leadership:**
  Huang "Howard" Zhipeng (Huawei)
- › **Goal:**
  Define an ML Workflow and promote cross project integration

- › **Slack conversation channel:**
  #ml-workflow
  https://lfaifoundation.slack.com/archives/C011V9VSMQR
- › **Wiki:**
  https://wiki.lfaidata.foundation/pages/viewpage.action?pageId=10518537
- › **Email lists:**
  https://lists.lfaidata.foundation/g/mlworkflow-committee
- › **Next call:** Monthly check calendar/slack
  https://wiki.lfai.foundation/pages/viewpage.action?pageId=18481242

⊐LF AI & DATA

BI & AI

› **Leadership:**
Cupid Chan (Index Analytics)
› **Goal:** Identify and share industry best practices that combine the speed of machine learning with human insights to create a new business intelligence and better strategic direction for your organization.

› **Slack conversations channel:**
#bi-ai-committee
https://lfaifoundation.slack.com/archives/C01EK5ND073
› **Github:**
https://github.com/odpi/bi-ai
Wiki:
https://wiki.lfaidata.foundation/pages/viewpage.action?pageId=35160417
Email lists:
https://lists.lfaidata.foundation/g/biai-discussion
Next call: Monthly community call TBD

⊑LF AI & DATA

Ongoing effort to create AI Ethics Training

Initial developed course by the LF: Ethics in AI and Big Data - published on edX platform:
https://www.edx.org/course/ethics-in-ai-and-big-data

The goal is to build 2 more modules and package all 3 as a professional certificate - a requirement for edX

› **To participate:**
https://lists.lfaidata.foundation/g/aiethics-training

LF AI & DATA

Upcoming TAC Meetings

LF AI & DATA

Upcoming TAC Meetings

› **December 31st :** No meeting - New Year's Eve Holiday

› **January 14th:** Still TBD **–Dataset Lifecycle Framework - Project proposal Yiannis Gkoufas (IBM),**

Seldon – Incubation Proposal, Sandbox – Revise Project Stages Policy Proposal, LF AI & Data Services

Please send agenda topic requests to
tac-general@lists.lfaidata.foundation

TAC Meeting Details

› To subscribe to the TAC Group Calendar, visit the wiki:
  https://wiki.lfaidata.foundation/x/cQB2
› Join from PC, Mac, Linux, iOS or Android: https://zoom.us/j/430697670

› Or iPhone one-tap:

  › US: +16465588656,,430697670# or +16699006833,,430697670#

› Or Telephone:

  › Dial(for higher quality, dial a number based on your current location):

  › US: +1 646 558 8656 or +1 669 900 6833 or +1 855 880 1246 (Toll Free) or +1 877 369 0926 (Toll Free)

› Meeting ID: 430 697 670

› International numbers available: https://zoom.us/u/achYtcw7uN

□LF AI & DATA

Open Discussion

LF AI & DATA

Mission

To build and support an open community and a growing ecosystem of open source AI, data and analytics projects, by accelerating innovation, enabling collaboration and the creation of new opportunities for all the members of the community

Legal Notice

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