Meeting of the LF AI & Data Technical Advisory Council (TAC)

February 23, 2023

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Antitrust 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.

Recording of Calls

Reminder:

TAC calls are recorded and available for viewing on the TAC Wiki

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
› Youtube: https://www.youtube.com/channel/UCfasaeqXJBCAJMNO9HcHfbA
› LF AI Logos: https://github.com/lfaidata/artwork/tree/master/lfaidata
› LF AI Presentation Template: https://drive.google.com/file/d/1eiDNJvXCqSZHT4Zk_-czASlz2GTBRZk2/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 from previous meeting (2 mins)

› Annual Review of NNStreamer (MyungJoo Ham20 mins)

› Outreach Committee Update (Jerry Tan 10 minutes)

› Open Discussion

TAC Voting Members - Please note

Please ensure that you do the following to facilitate smooth procedural quorum and voting processes:

- Change your Zoom display name to include your First/Last Name, Company/Project Represented
  - example: Nancy Rausch, SAS
- State your First/Last Name and Company/Project when submitting a motion
  - example: First motion, Nancy Rausch/SAS

TAC Voting Members - Please note

› TAC members must attend consistently to maintain their voting status

› After 2 absences voting members will lose voting privileges

› Voting privileges will only be reinstated after attending 2 meetings in a row

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23FEB2023

TAC Voting Members

Note: we still need a few designated backups specified on wiki

Member Representatives (8 out of 16 required for quorum)

Member Company or Graduated Project	Membership Level or Project Level	Voting Eligibility	Country	TAC Representative	Designated TAC Representative Alternates
4paradigm	Premier	Voting Member	China	Zhongyi Tan	
Baidu	Premier	Voting Member	China	Jun Zhang	Daxiang Dong, Yanjun Ma
Ericsson	Premier	Voting Member	Sweden	Rani Yadav-Ranjan	
Huawei	Premier	Voting Member	China	Howard (Huang Zhipeng)	Charlotte (Xiaoman Hu) , Leon (Hui Wang)
Nokia	Premier	Voting Member	Finland	@ Michael Rooke	@ Jonne Soininen
OPPO	Premier	Voting Member	China	Jimmy (Hongmin Xu)	
SAS	Premier	Voting Member	USA	*Nancy Rausch	JP Trawinski
ZTE	Premier	Voting Member	China	Wei Meng	Liya Yuan
Adversarial Robustness Toolbox Project	Graduated Technical Project	Voting Member	USA	Beat Buesser	Kevin Eykholt
Angel Project	Graduated Technical Project	Voting Member	China	Jun Yao	
Egeria Project	Graduated Technical Project	Voting Member	UK	Mandy Chessell	Nigel Jones, David Radley, Maryna Strelchuk, Ljupcho Palashevski, Chris Grote
Flyte Project	Graduated Technical Project	Voting Member	USA	Ketan Umare	
Horovod Project	Graduated Technical Project	Voting Member	USA	Travis Addair	
Milvus Project	Graduated Technical Project	Voting Member	China	Xiaofan Luan	Jun Gu
ONNX Project	Graduated Technical Project	Voting Member	USA	Alexandre Eichenberger	Prasanth Pulavarthi, Jim Spohrer
Pyro Project	Graduated Technical Project	Voting Member	USA	Fritz Obermeyer	

Minutes approval

Approval of February 9, 2023 Minutes

Draft minutes from the February 9 TAC call were previously distributed to the TAC members via the mailing list

Proposed Resolution:

› That the minutes of the February 9 meeting of the Technical Advisory Council of the LF AI & Data Foundation are hereby approved.

NNStreamer Annual Review 2023

MyungJoo Ham

myungjoo.ham@samsung.com (MyungJoo)

NNStreamer

Brief Description:

NNStreamer is a set of GStreamer plugins that support ease and efficiency for GStreamer developers adopting neural network models and machine learning application and service developers managing neural network pipelines and their filters.

TSC Chairperson: MyungJoo Ham

Contributed by:
Initially contributed by Samsung Research in 2018, and added as a Incubation Project in 2020

Key Links:

Github: https://github.com/nnstreamer

Website: https://nnstreamer.ai

Artwork:

https://artwork.lfaidata.foundation/projects/nnstreamer/

Mailing lists:
›   nnstreamer-announce
›   nnstreamer-technical-discuss

👁 Unwatch 36 ⌄	⑂ Fork 145 ⌄	⭐ Starred 560 ⌄

openssf best practices passing

Official Releases

	Tizen	Ubuntu	Android	Yocto	macOS
	5.5M2 and later	~~16.04~~/18.04/20.04/22.04	9/P	Kirkstone	
arm	test pass	Available	Available	Ready	N/A
arm64	test pass	Available	build pass	Ready	N/A
x64	test pass	test pass	Ready	test pass	Available
x86	test pass	N/A	N/A	Ready	N/A
Publish	Tizen Repo	PPA	Daily build	Layer	Brew Tap

Organizations contributing

Name	Logo	Contributors	Last Activity	Commits	LOC Added	LOC Deleted	Pull Request Activities	Issue Activities	Documentation Activities
Samsung Electronics Co. Ltd.	SAMSUNG	87	02/03/2023	6.73K	743.92K	311.19K	43.72K	6.77K	0
NXP Semiconductors Netherlands B.V.	NXP	4	10/13/2022	42	2.21K	306	0	0	0
The Linux Foundation	THE LINUX FOUNDATION	1	03/26/2020	4	23	2	0	0	0
ID4All		1	11/16/2022	3	36	159	0	0	0
Collabora Ltd.	COLLABORA	1	02/26/2019	1	1	1	0	0	0
openSUSE		1	12/01/2021	0	0	0	0	16	0
KAIST	KAIST 1971	1	01/14/2022	0	0	0	0	4	0
Danggeun Market Inc		1	04/28/2021	0	0	0	26	2	0

Organizations contributing (Top 4)

Name	Logo	Contributors	Last Activity	Commits	LOC Added	LOC Deleted
Samsung Electronics Co. Ltd.	**SAMSUNG**	87	02/03/2023	6.73K	743.92K	311.19K
NXP Semiconductors Netherlands B.V.	NXP	4	10/13/2022	42	2.21K	306
The Linux Foundation	THE LINUX FOUNDATION	1	03/26/2020	4	23	2
ID4All		1	11/16/2022	3	36	159

Contributions
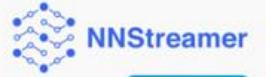
NNStreamer

< Share

● **Last Sync:** 02/08/2023 3:01:56 AM (aggregated based on each repo)

📅 2020

? Neural Network (NN) Streamer, Stream Processing Paradigm for Neural Network Apps/Devices.

AI, ML, Data & Analyt...

View Trends

Technical Contributions

TOTAL LOC	COMMITS	CONTRIBUTORS	PULL REQUESTS
339.23K	7.12K	97	5.36K

PULL REQUESTS MERGED	MERGED LEAD TIME	ISSUES	ISSUES RES. TIME
4.94K	5.05 Days	2.16K	54.47 Days

Best Practices Score

Best Practice Score is based on the OSSF Scorecard project (https://github.com/ossf/scorecard) and provides a number of heuristics or 'scores' across multiple checks. These scores are meant to help the maintainers of the projects to monitor and improve their security best practices as well as provide OSS consumers evaluate their dependencies.

87%

Documentation	95
License	75
Best Practices	74
Security	65
Legal	100

15
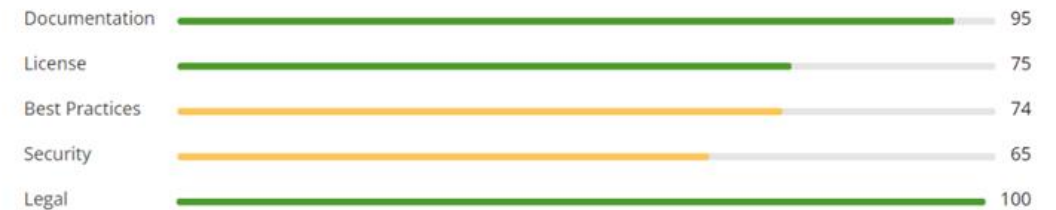
Key Achievements in 2022: Conferences

Conference Reseach Papers

- "Toward Among-Device AI from On-Device AI with Stream Pipelines"
  - **ICSE 2022 (published)**, about among-device AI pipelines
  - Allow "among-device AI" by connecting pipelines of different devices
- "A New Frontier of AI: On-Device AI Training and Personalization Framework"
  - **USENIX ATC 2023 (submitted)**, about memory-efficient training mechanisms.
    - e.g., 220MB for Transformer (TF/TF-Lite: >20GB, PyTorch: >5GB)

NNStreamer Conference 2022

- Seoul, 2022-Feb-16: https://youtu.be/KjwGjzKvF9k
- Participants: Samsung, Fainders.AI, Klleon, KAIST

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Key Achievements in 2022: Key Features

Key Features

- ## Among-Device AI Pipeline
  - MQTT/ZMQ connections, "Query" connections.
  - Being ready for "SmartThings" and "Matter"
- ## Tensor Stream Standard Updates
  - "Flexible", "Sparse", "FP16", RANK>4, #Tensors > 16, ...
- ## Plugins expanded
  - Flexbuf (converter/decoder), LUA script as filters, "Tensor-IF" with arbitrary functions, Tensoflow-lite delegations, PBTXT parser for WYSIWYG pipeline editing, ...
  - Samsung/TRIx NPU, NXP/DeepViewRT, MXNET, Custom TF2-lite,

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Key Achievements in 2022: Spin-off Projects

NNTrainer, "On-Device Training for AI Personalization"

- Lightweight training for personalization
  - Transformer: 220MB (TF: > 20GB, PyTorch: >5GB)
- Full neural-net modifiability
- Deployed to products (Galaxy S23)

"MLOPS for On-Device AI"

- "NNStreamer-Edge": AI execution across multiple devices
- "ML Agent": AI service deployment, data management, ...

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Key Achievements in 2022: Products in Samsung

Deployed in 2022/2023

- Galaxy S23
- Robotic Vacuum
- TV AI services (2022+ models)
  - NNStreamer as the standard framework for TRIx NPU series
- Fridges, "AI" Oven, Air conditioner, …
- Augmented worker (automotive factories)

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Key Achievements in 2022: Startups w/ NNStreamer

FAINDERS.AI

Retail automation

- Multi-cam real-time inferences
- Deployed in Korea (experimental)

PrintNanny.ai

3d printer monitoring service
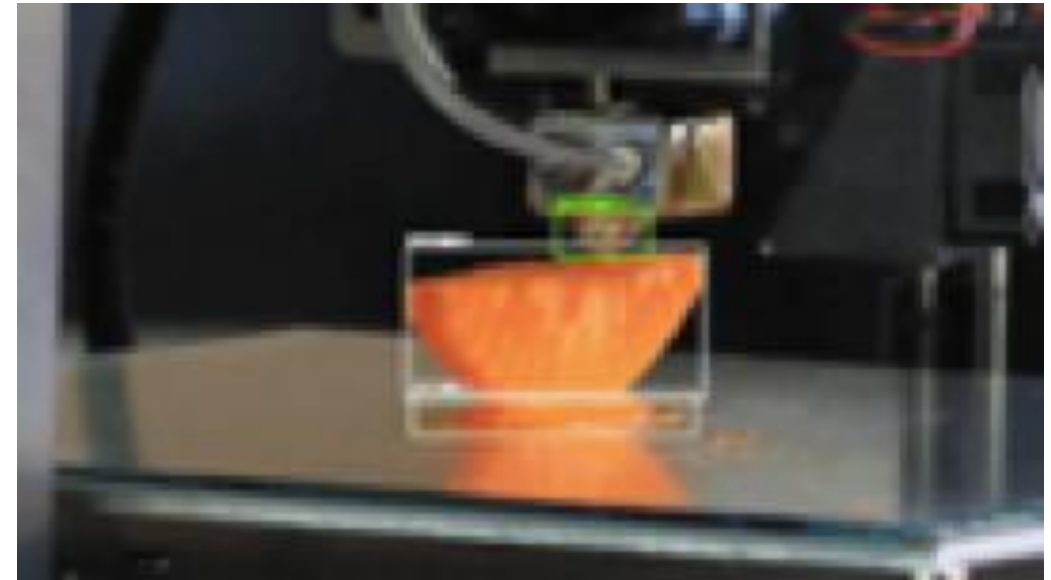
- NNStreamer Rust binding
- Services deployed ($9.99/mo)

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Key Achievements in 2022: Startups w/ NNStreamer

Klleon.io

Audio/video generation

Text → Video & Audio

openncc.com

Edge-AI camera platform

Embedded AI

for cameras

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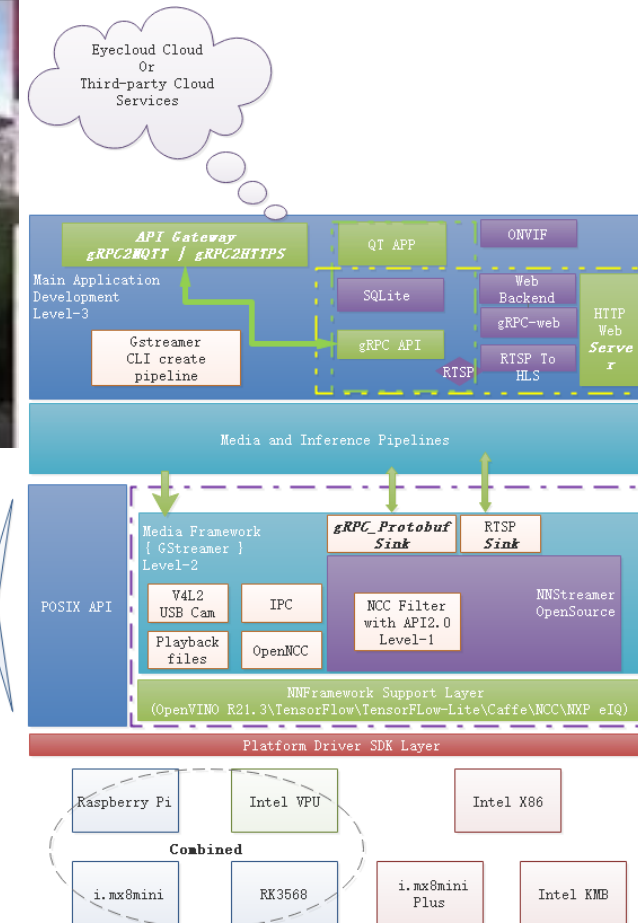
Other NNStreamer users

Job description including "fluent in NNstreamer"

- Hyundai Motor (robotics division?): a few developers are known to be using...
- Aivero, Qualcomm-India, Samsara, Innobox, ...

Indirectly known to use NNStreamer

- LG Electronics (multimedia framework of webOS, work-in-progress 2022~now)
- Axelera, T.Schulz (founder-in-residence), Lunit, Sber, …

NXP: NNStreamer as the standard AI framework for iMX series.

openSUSE: NNStreamer in recent releases

Freescale: NNStreamer in their Yocto AI support.

Areas the project could use help on

NNStreamer expanding to "AI personalization"+"Device MLOps"

: Does MLOps Committe work on device-side MLOps?

(training on device to personalize AI models, constructing

inference/training pipelines on/among devices, ...)

Stream Database, lightweight and native (C/C++)

: There are stream database (e.g., LF/Pravega). However, we cannot afford running major components w/ Java on devices.

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Feedback on working with LF AI & Data

- LF started working on RISC-V. What about LF AI & Data?
  - E.g., RISC-V extension for ML?

- Just found https://www.facebook.com/LinuxFoundationKorea/
  - Do you have events, organizations, or anything in Korea or nearby regions?
  - LF AI&Data - LF collaboration?

TAC Open Discussion

Legal Notices

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Outreach Committee Update
Jerry Tan

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Analysis of survey
in outreach committee

Jerry Tan

2023/2/22

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› Survey information

› Results of Survey

› Analysis of Survey

› Outreach Plan for 2023

› Q & A

› As Jerry Tan is elected as the Outreach chair in 2023,

› I want to collect feedback and suggestion from outreach committee.

› So I made this survey, and publish it via mail list and Wechat group

1. Have you ever participated in any of the outreach events that organized by LF AI in 2022?

2. Which LF AI Outreach events have you participated in in 2022?

3. How likely is it that you would recommend the LF AI Outreach events to a friend or colleague?

4. What is the reason that you have not participated in ?

5. Please give an example of your favorite Outreach event in 2022 and why? (Not organized by LF AI)

6. Do you have any advise or suggestion for LF AI Outreach-Committee further improvement in 2023 ?

Survey result: 6 people participated

> 1.Have you ever participated in any of the outreach events that organized by LF AI in 2022?

        Yes, 2/6，No，4/6

> 2.Which LF AI Outreach events have you participated in in 2022?
>   AI Con，Hangzhou

> 3.How likely is it that you would recommend the LF AI Outreach events to a friend or colleague?
>   Only 3 answer，skip

> 4.What is the reason that you have not participated in ？
>
> I didn't see event information
>
> I don't know how to participate

> 5. Please give an example of your favorite Outreach event in 2022 and why? (Not organized by LF AI)

      KubeCon

> 6.Do you have any advise or suggestion for LF AI Outreach-Committee further improvement in 2023 ?
> ①Looking forward to more events
> ②More international events are expected.
> ③Back to offline and go to more city (meetup format？)

Survey Analysis

› Not many people participated because they lack of information

› They want to participate more offline-events

› KubeCon is their ideal reference

› Focus on 2 main events --- AI Con,　with indepent branding
  › One is outside of China,　the first half year
  › Another is in China,　the second half year

› Participate in other Cons --- GotoC,　KubeCon,　etc

› More offline meetups　（half-day or one-day）

Q & A

TAC Open Discussion

Upcoming TAC Meetings

Upcoming TAC Meetings

› Mar 9, 2023 – Egeria Annual Review

› Mar 23 – Sparklr Annual Review

Please note we are always open to special topics as well.

If you have a topic idea or agenda item, please send agenda topic requests to
tac-general@lists.lfaidata.foundation

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Open Discussion

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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

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