

## LF AI & Data Foundation Technical Advisory Council (TAC) Meeting Minutes June 29, 2023 (6:00am - 7:00am PST) via Zoom

TAC Meetings are bi-weekly and open to everyone in the LF AI & Data community.

### Voting Notes

Under the original charter rules we need 50% attendance from the voting members (represented by premier members + graduate projects) to meet quorum. To ensure quorum is met more consistently, the TAC implemented the following attendance and voting eligibility rule effective Dec 1, 2022: Voting members of the TAC who miss 2 consecutive meetings will not be allowed to vote and must then attend 2 consecutive meetings before their voting privileges are reinstated.

With the new attendance and voting rule adopted by the TAC, the number of eligible voting members varies per week and is tracked [here](#). Please see meeting minutes on the [TAC Wiki](#) for details on attendance and voting eligibility on a per meeting basis.

Please see the [TAC Wiki](#) for more information about voting.

Please see current voting members, including alternates, on the [TAC Wiki](#).

Voting details for today's meeting: **9** voting members were eligible to vote and **9** voting members were in attendance. Quorum was met for this meeting.

TAC Voting Member	Voting Representative	6/20/2023
<b>Quorum</b>	<b>Attendance/No. Eligible Votes</b>	<b>0.9</b>
4paradigm	Zhongyi Tan	Jerry Tan
Baidu	Jun Zhang	
	Alternate: Daxiang Dong	
	Alternate: Yanjun Ma	
Ericsson	Rani Yadav-Ranjan	
Huawei	Howard (Huang Zhipeng)	Huang Zhipeng
	Alternate: Charlotte (Xiaoman Hu)	
	Alternate: Leon (Hui Wang)	
IBM	Susan Malaika	Susan Malaika

	Alternate: Manish Nagireddy	
Nokia	Michael Rooke	Michael Rooke
	Alternate: Jonne Soininen	
OPPO	Jimmy (Hongmin Xu)	
SAS	*Nancy Rausch	Nancy Rausch
	Alternate: JP Trawinski	
ZTE	Wei Meng	Wei Meng
	Alternate: Liya Yuan	Alternate: Liya Yuan
Adversarial Robustness Toolbox Project	Beat Buesser	
	Alternate: Kevin Eykholt	Alternate: Kevin Eykholt
Angel Project	Jun Yao	
Egeria Project	Mandy Chessell	Mandy Chessell
	Alternate: Nigel Jones	
	Alternate: David Radley	
	Alternate: Maryna Strelchuk	
	Alternate: Ljupcho Palashevski	
	Alternate: Chris Grote	
Flyte Project	Ketan Umare	
Horovod Project	Travis Addair	
Milvus Project	Xiaofan Luan	
	Alternate: Jun Gu	
ONNX Project	Alexandre Eichenberger	
	Alternate: Jim Spohrer	
	Alternate: Prasanth Pulavarthi	
	Alternate: Andreas Fehlner	Alternate: Andreas Fehlner
Pyro Project	Fritz Obermeyer	

**Note for Voting Members**

Please ensure you attend the bi-weekly TAC meetings to maintain voting eligibility. If you have not already provided an alternate representative, please email Nancy Rausch (Nancy.Rausch@sas.com), TAC Chair AND operations@lfaidata.foundation to designate an alternate representative. It is critical to meet quorum during the meetings especially when there are voting items on the agenda.

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### **LF Attendees**

Lucy Hyde, Program Manager, Linux Foundation

Reden Martinez, Project Coordinator, Linux Foundation

### **Invited Guests/Presenters**

Miguel Fierro - Recommenders Project, Microsoft

Adrian Gonzalez Sanchez - Recommenders Project - Microsoft

Andreas - Recommenders Project - Microsoft

Ruth Akitunde

Jigisha Mavani

Ofer Hermoni

KDuck

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### **Call to Order**

Nancy Rausch (NR) called the meeting to order at 6:10 am Pacific and Lucy Hyde (LH) recorded the minutes.

NR reviewed the Antitrust Policy notice.

### **Agenda**

Nancy Rausch (NR) reviewed the agenda for the meeting. There were no further changes or additional topics added.

- Roll Call (1 mins)
- Approval of Minutes from previous meetings (2 mins)
- Recommenders Project Presentation - Microsoft (40 mins)
- Open Discussion

## **Approval of Minutes**

Nancy Rausch (NR) presented a resolution to approve the minutes of the June 15, 2023 TAC meeting.

Proposed Resolution:

That the minutes of the June 15, 2023 meeting of the Technical Advisory Council of the LF AI & Data Foundation are hereby approved.

Michael Rooke made the first motion to approve the minutes, Wei Meng seconded the motion.

APPROVED - By vote of the TAC, the minutes of the June 15, 2023 meeting of the Technical Advisory Council were approved.

## **Recommenders Project from Microsoft, new Sandbox project proposal**

Nancy Rausch (NR) welcomed Miguel Fierro (MF) from Microsoft. MF gave an introduction and started the presentation of the project: Recommenders.

The introduction highlights that recommendation systems are prevalent across various platforms such as social networks, e-commerce, and streaming services. The aim is to develop a solution called Microsoft Recommenders that can facilitate the creation of recommendation systems.

Microsoft Recommenders is the name of the repository, primarily consisting of code contributed by Microsoft employees. However, the project also welcomes contributions from individuals and organizations affiliated with different educational institutions and companies.

MF shared the advantages of contributing the project to the Linux Foundation. Contributing to the Linux Foundation offers numerous advantages due to its vendor-neutral, non-profit nature and open governance model. The foundation operates with transparency and fosters trust among contributors and adopters, ensuring fair and impartial management of project assets. By joining the Linux Foundation, projects gain access to a growing community and increased visibility through the LF ecosystem. Furthermore, the foundation provides opportunities for collaboration with other hosted projects, allowing for knowledge sharing and the conversion of new and existing users into contributors.

At present, the project has approximately 100 contributors and aims to expand its contributor base. Regarding recommendation systems, it is widely regarded as a solution that yields significant impact. MF presented the far-reaching influence of recommendation systems in both modern business and academic research. For instance, it was revealed that 35% of consumer purchases

on Amazon and 75% of their viewing choices on Netflix can be attributed to recommendation algorithms. Moreover, a staggering 60% of video clicks on the YouTube homepage originate from recommendations. Notably, BestBuy experienced a notable online sales growth of 23.7% owing to factors such as a streamlined checkout process, improved navigation, and relevant product recommendations.

The underlying concept is that recommendations have the potential to indirectly drive revenue by enhancing customer engagement, network effects, and other related factors. Additionally, by identifying certain business key performance indicators (KPIs) that directly influence revenue, such as advertising clicks and internet traffic, recommendations can serve as a catalyst for generating income. Furthermore, personalized customer segmentation allows for precise targeting of customers through marketing campaigns or products, which indirectly contributes to revenue growth.

According to MF's insights, the project's history and evolution were also shared. The initial algorithms for recommendation systems were developed in the 1990s. A significant milestone occurred in 2006 with the introduction of the Netflix Prize, a competition where Netflix offered a substantial prize of 1 million dollars. This competition marked a major advancement in machine learning and stood as the largest competition of its kind.

In 2010, there was a notable progression in the field with the emergence of hybrid models incorporating machine learning techniques such as LR, FM, GBDT, and others. These models employed pair-wise ranking methods to enhance recommendation accuracy.

The year 2015 witnessed a significant shift with the rise of Deep Learning techniques, which led to the proliferation of neural models in recommendation systems. Models like PNN, Wide & Deep, DeepFM, and xDeepFM gained prominence during this period.

Currently, the focus is on advancing recommendation systems in various directions. These include the development of Explainable Recommendation systems, Knowledge Enhanced Recommendation systems, and the utilization of Reinforcement Learning and Transfer Learning techniques to enhance recommendation algorithms.

In summary, the project's journey has witnessed the evolution of algorithms from the 1990s to the present day, incorporating machine learning, deep learning, and other cutting-edge techniques to continually improve and expand recommendation systems.

During the presentation, MF highlighted the challenges encountered in Recommendation Systems, which have been identified by the project. One of the key challenges is the scarcity of

comprehensive references and guidance available for constructing recommender systems that can effectively handle enterprise-grade scenarios at scale. The existing packages, tools, and modules offered in the market are often fragmented, lacking scalability, and facing compatibility issues with one another.

Furthermore, it was emphasized that the field of recommendation systems is rapidly evolving, with new algorithms emerging on a daily basis. However, the expertise required to implement and deploy recommender systems using state-of-the-art algorithms is not widespread, making it a specialized area with limited practitioners.

In summary, the challenges outlined by MF encompass the need for better resources to support scalable recommender systems in enterprise settings, the lack of cohesion and compatibility among existing tools, and the scarcity of skilled professionals with expertise in implementing cutting-edge algorithms for recommendation systems.

### **What is Recommenders Project?**

The project is a collaborative effort between Microsoft Cloud & AI data scientists, Microsoft Research researchers, and academia researchers. The project's repository can be found at <https://github.com/Microsoft/Recommenders>

The repository contains various contents, including:

- **Utilities:** This section consists of modular functions that facilitate tasks such as model creation, data manipulation, evaluation, and more.
- **Algorithms:** A collection of recommendation algorithms such as SVD, SAR, ALS, NCF, Wide&Deep, xDeepFM, DKN, and others. These algorithms can be utilized for developing recommendation systems.
- **Notebooks:** This section provides practical examples and how-to guides for building end-to-end recommendation systems. These notebooks serve as a valuable resource for understanding and implementing recommendation techniques.

Overall, the project brings together experts from different domains to collaborate on developing recommendation systems, offering utilities, a range of algorithms, and practical notebooks as resources for researchers, data scientists, and developers.

MF also shared the objective of the project and it can be summarized as "Taking recommendation technology to the masses" by providing assistance to researchers and developers in efficiently

selecting, prototyping, demonstrating, and deploying recommender systems. The project aims to expedite the development and deployment of recommender systems in enterprise-grade environments. It offers a systematic overview of recommendation technology, focusing on practical perspectives, while also incorporating state-of-the-art academic research in recommendation algorithms. The project also provides best practices, including example codes, to guide the development of recommender systems.

MF also presented the Project Best Practice workflow, which outlines the fundamental steps involved in developing recommendation systems. This workflow includes data preparation, including functions for data splitting, as well as the utilization of various algorithms such as content-based and collaborative filtering. Additionally, different metrics are highlighted, including Rating Metrics, Ranking Metrics, and Diversity Metrics, which are essential for evaluating recommendation system performance.

MF shared the 30+ recommendation algorithms and the type of algorithms in Recommenders. MF also showed the Recommenders Library, Example Class, and the Recommenders Notebook examples.

The notebooks provided in the project serve as a valuable resource for data scientists, offering a starting point for their work. By replacing the dataset used in the notebooks with their own data, data scientists can quickly implement a recommendation system and have it operational. These notebooks provide an efficient approach for implementing recommendation algorithms, whether for research purposes, proof-of-concepts (POCs), or even production environments.

For the comprehensive details and specific information, the project repository is available.

### **Recommenders Tests**

Two types of tests from Project Recommenders were discussed during the session: PR gates and nightly builds.

PR gates are quick tests that are executed after a pull request is made. Their purpose is to ensure that the code changes introduced by the pull request do not cause any breaking issues before merging it into the project.

On the other hand, nightly builds are tests that run asynchronously and may take several hours to complete. These tests cover a wider range of scenarios and some of them are time-consuming, making it impractical to execute them in the PR gate. As a result, they are scheduled to run separately during the nightly builds.

Overall, the combination of PR gates and nightly builds allows for both quick validation and thorough testing of the code changes in Project Recommenders, ensuring the stability and reliability of the project.

MF also shared the other Test Categories and the Recommenders Coding Guidelines including the options to try out Recommenders. MF also provided an overview of the project, highlighting its significance and future opportunities.

### **Open Discussion**

Susan Malaika (SM) inquired about the usage of the project as a teaching tool in schools and universities. In response, Miguel Fierro (MF) confirmed that they incorporate the project's resources in the teaching, specifically in the areas of ChatBot and Recommendation systems. The project's materials and tools are being utilized in universities to support the educational process.

SM also inquired about the timeline of the project's open-source release. It was shared that the project was made open-source approximately five years ago. The initial commit took place in September 2018, and from the early stages, MF has been actively involved in the project's development and contributions.

Nancy Rausch (NR) mentioned that the project is deployed in Databricks, allowing users to access and utilize its functionalities. NR then asked if there are customers who host their systems and utilize the algorithms, it was confirmed by MF that there are indeed many customers who use Recommenders. Additionally, the project itself utilizes Recommenders for various projects.

Regarding domain-specific examples, NR inquired if the project is used in multiple domains such as healthcare or other similar industries. MF confirmed that the usage of Recommenders in different domains depends on the specific requirements. This suggests that the project is adaptable and can be applied to various industries sharing again what is available in the repository.

### **Proposed Resolution:**

That the Recommenders project is approved by the Technical Advisory Council (TAC) as a Sandbox project of the LF AI & Data Foundation.

Susan Malaika made the first motion to approve, and Mandy Chessell seconded the motion.

APPROVED - By vote of the TAC, the ISF project was approved as a Sandbox project.

### Upcoming TAC Meetings

July 13 - ShaderNN Project, a new Incubation project proposal from OPPO

July 29 - Docarry proposal to move from sandbox to incubation - Tentative Project Review

Please note the TAC is always open to agenda suggestions and guest presentations. If you have a topic you would like to request, please email [tac-general@lists.lfaidata.foundation](mailto:tac-general@lists.lfaidata.foundation) for review and coordination via the TAC Chair accordingly.

### Closing

With no further business, the meeting was adjourned by NR at 6:56AM Pacific.

### Chat:

21:45:03 From Adrian Gonzalez Sanchez (LF Trusted AI / Microsoft / OdiselA) to Everyone:  
Ref: <https://github.com/microsoft/recommenders>

21:45:31 From Adrian Gonzalez Sanchez (LF Trusted AI / Microsoft / OdiselA) to Everyone:  
some numbers:  
15.9k stars  
262 watching  
2.8k forks

21:46:33 From Adrian Gonzalez Sanchez (LF Trusted AI / Microsoft / OdiselA) to Everyone:  
Some learning resources (besides repo) <https://learn.microsoft.com/en-us/azure/architecture/reference-architectures/ai/real-time-recommendation>

21:47:14 From Andreas to Everyone:

We have also had a contribution from LSE Master's students as a Master's project

21:48:50 From susan malaika (IBM - voting) to Everyone:

Wonderful presentation - loved it - thorough and informative - and an excellent project

21:49:12 From susan malaika (IBM - voting) to Everyone:

Reacted to "We have also had a c..." with ❤️

21:49:26 From susan malaika (IBM - voting) to Everyone:

Reacted to "Some learning resour..." with 👍

21:50:16 From LF AI & Data Zoom General to Everyone:

Reacted to "Wonderful presentati..." with 👍

21:50:20 From LF AI & Data Zoom General to Everyone:

Reacted to "We have also had a c..." with 👍

21:52:35 From susan malaika (IBM - voting) to Everyone:

Wondering if an opens4all class could be created around recommender

21:53:04 From LF AI & Data Zoom General to Everyone:

Reacted to "Wondering if an open..." with 

21:53:51 From Adrian Gonzalez Sanchez (LF Trusted AI / Microsoft / OdiselA) to Everyone:

Reacted to "Wonderful presentati..." with 

21:54:24 From Ofer Hermoni to Everyone:

Congratulations! Amazing project!

21:54:34 From Lucy Hyde | Program Manager to Everyone:

Congratulations!! We will follow up