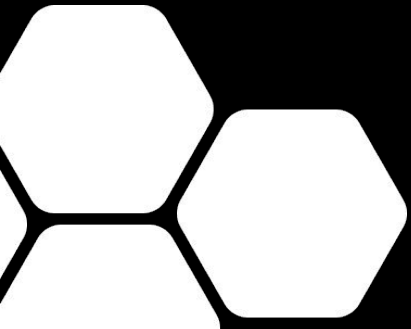




Building Authentic AI: **Decentralized Knowledge Graph and Knowledge Mining**



International Conference on Evolving Internet
March 12th 2024

origintrail.io

AI anomalies pose a huge threat to the internet

Hallucinations

Data ownership and intellectual property

Centralization

Bias

Model collapse

Vision for a verifiable internet in the new paper

Verifiable Internet for Artificial Intelligence: The Convergence of Crypto, Internet and AI

Pre-publication

Trace Labs
OriginTrail Core developers
Feedback & Discussion : <https://discord.gg/9CvynQ9kYe>

"We live in a time of abundant connectivity and alas abundant misinformation. The OriginTrail Decentralized Knowledge Graph (DKG) is an evolving tool for finding the truth in knowledge.

In particular, we see knowledge graphs improving the fidelity of artificial intelligence."
Dr Bob Metcalfe, Ethernet inventor & Internet pioneer


Abstract

This whitepaper presents a vision for the future of Artificial Intelligence (AI) through the concept of a Verifiable Internet for AI, leveraging the synergies of crypto, internet, and AI technologies. It introduces the Decentralized Knowledge Graph (DKG), a novel approach to ensure the provenance, integrity, and verifiability of information utilized by AI systems. It aims to address the challenges posed by misinformation, data ownership, intellectual property rights, and biases inherent in AI technologies, by synergizing neural and symbolic AI approaches with Web3 technologies. The whitepaper delves into the intricate mechanics of the DKG, how it enhances AI reliability with Knowledge Assets and supports autonomous paratexts. The Verifiable Internet for AI is not only a technological advancement but a paradigm shift towards a more transparent, inclusive, and ethical digital landscape. This vision combines blockchain technology with the dynamic capabilities of AI to foster a democratic, ethically guided, and economically viable future for AI applications.

1 Purpose

The sudden rise of Artificial Intelligence (AI) in the mainstream is reshaping all of our interactions with knowledge. It changes how we discover it, how we process it for our advantage, and how we use it to create new knowledge. It





”The way you train that (AI) system **will have to be crowdsourced**
... if you want it to be **a repository of all human knowledge**, all
humans need to contribute to it.”

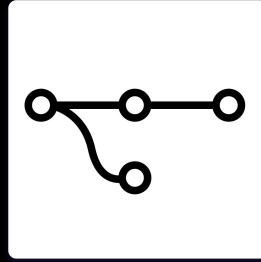
Yann LeCun, Turing Award Winner



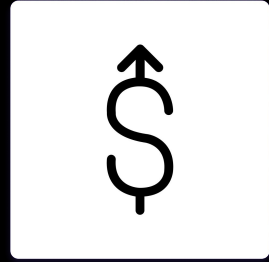
Characteristics of the Verifiable Internet for AI



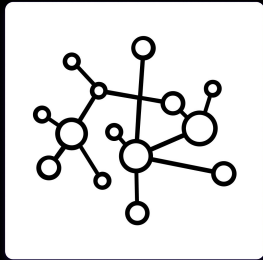
No hallucinations



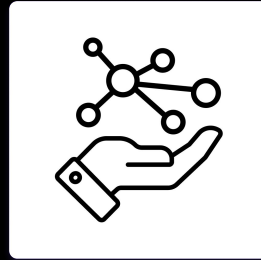
Information provenance



Embedded incentives



Multiple data sources & contributors

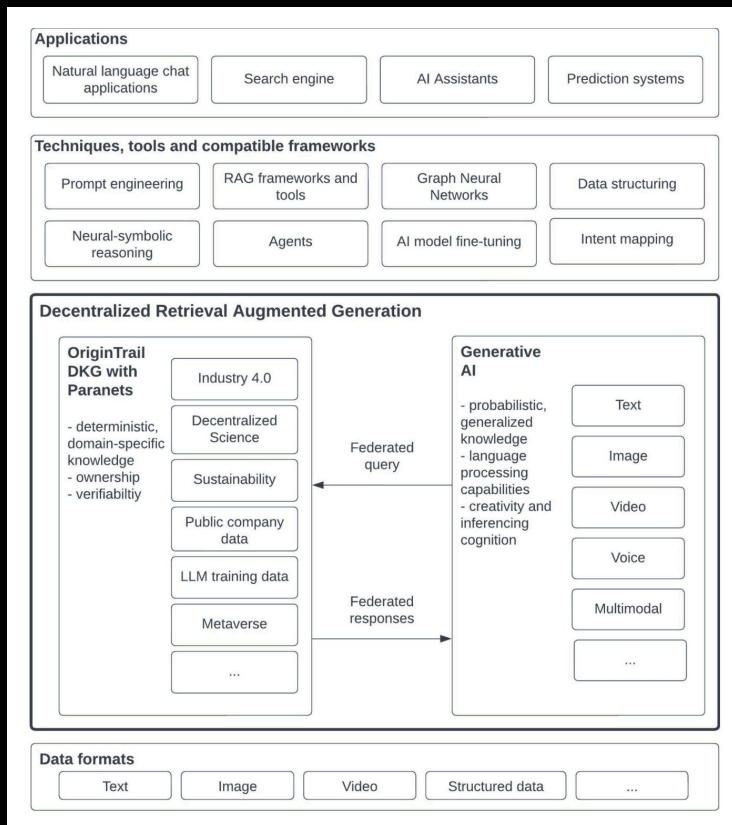


Data ownership



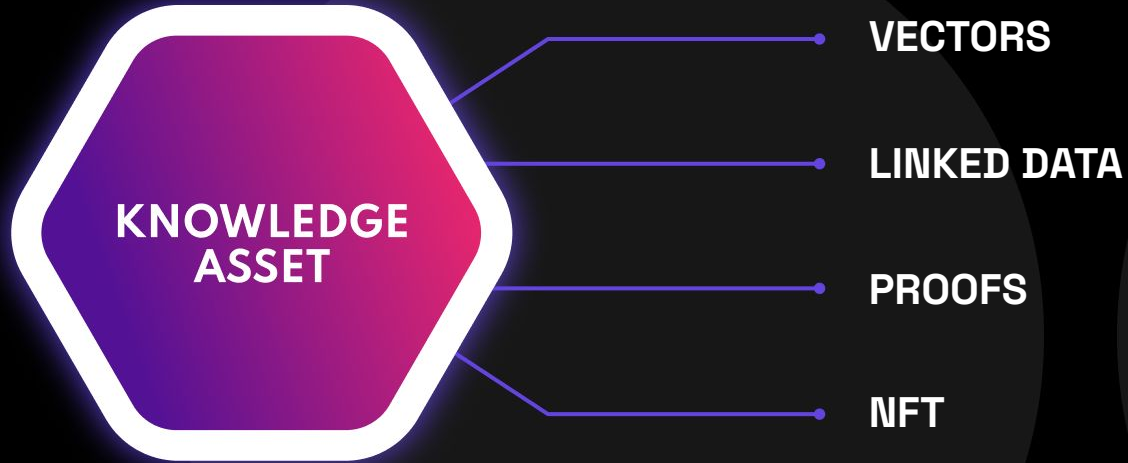
Data privacy

Verifiable Internet on the highest level



- AI operating on verifiable inputs & services
- **Data organized in a Decentralized Knowledge Graph (DKG)**
- **Web3 infrastructure pluggable in broadest sense**
- **Trust root through blockchains**
- **Positive alignment** through token incentives

Knowledge Assets



Unifying Large Language Models and Knowledge Graphs: A Roadmap

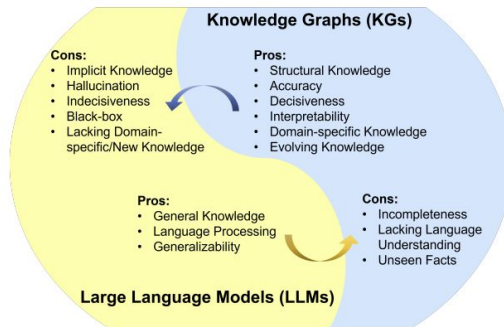
Shirui Pan, *Senior Member, IEEE*, Linhao Luo,
Yufei Wang, Chen Chen, Jiapu Wang, Xindong Wu, *Fellow, IEEE*

Abstract—Large language models (LLMs), such as ChatGPT and GPT4, are making new waves in the field of natural language processing and artificial intelligence, due to their emergent ability and generalizability. However, LLMs are black-box models, which often fall short of capturing and accessing factual knowledge. In contrast, Knowledge Graphs (KGs), Wikipedia and Huapu for example, are structured knowledge models that explicitly store rich factual knowledge. KGs can enhance LLMs by providing external knowledge for inference and interpretability. Meanwhile, KGs are difficult to construct and evolve by nature, which challenges the existing methods in KGs to generate new facts and represent unseen knowledge. Therefore, it is complementary to unify LLMs and KGs together and simultaneously leverage their advantages. In this article, we present a forward-looking roadmap for the unification of LLMs and KGs. Our roadmap consists of three general frameworks, namely, 1) *KG-enhanced LLMs*, which incorporate KGs during the pre-training and inference phases of LLMs, or for the purpose of enhancing understanding of the knowledge learned by LLMs; 2) *LLM-augmented KGs*, that leverage LLMs for different KG tasks such as embedding, completion, construction, graph-to-text generation, and question answering; and 3) *Synergized LLMs + KGs*, in which LLMs and KGs play equal roles and work in a mutually beneficial way to enhance both LLMs and KGs for bidirectional reasoning driven by both data and knowledge. We review and summarize existing efforts within these three frameworks in our roadmap and pinpoint their future research directions.

Index Terms—Natural Language Processing, Large Language Models, Generative Pre-Training, Knowledge Graphs, Roadmap, Bidirectional Reasoning.

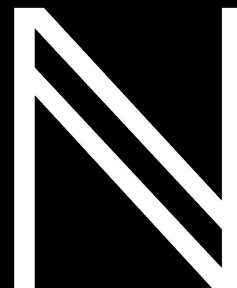
1 INTRODUCTION

Large language models (LLMs)¹ (e.g., BERT [1], RoBERTA [2], and T5 [3]), pre-trained on the large-scale corpus, have shown great performance in various natural language processing (NLP) tasks, such as question answering [4], machine translation [5], and text generation [6]. Recently, the dramatically increasing model size further enables the LLMs with the emergent ability [7], paving the road for applying LLMs as Artificial General Intelligence (AGI). Advanced LLMs like ChatGPT² and PaLM2³, with billions of parameters, exhibit great potential in many complex practical tasks, such as education [8], code generation [9] and recommendation [10].



NeuroWeb network

- Decentralized Artificial Intelligence blockchain
- **Designed to incentivise knowledge creation, connectivity and sharing through Knowledge Mining**
- 100% community bootstrapped & governed
- EVM support, Substrate based



neuroweb.ai

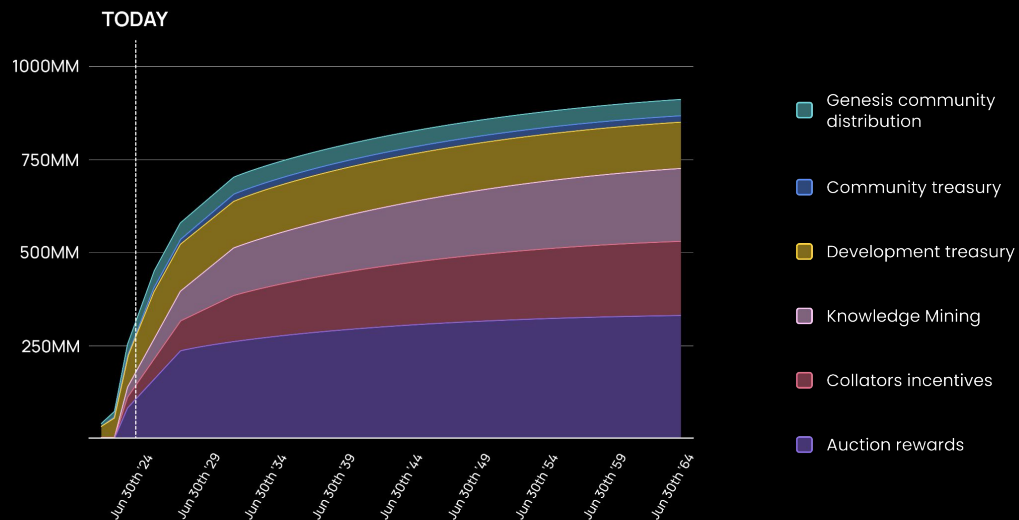
NEURO token fueling Decentralized AI

- Bitcoin incentivises PoW mining
- Neuro incentivises trusted knowledge mining and intelligence

How?

Neuro token emissions for Knowledge Mining through on chain Governance

“Crowdsourcing” knowledge for AI

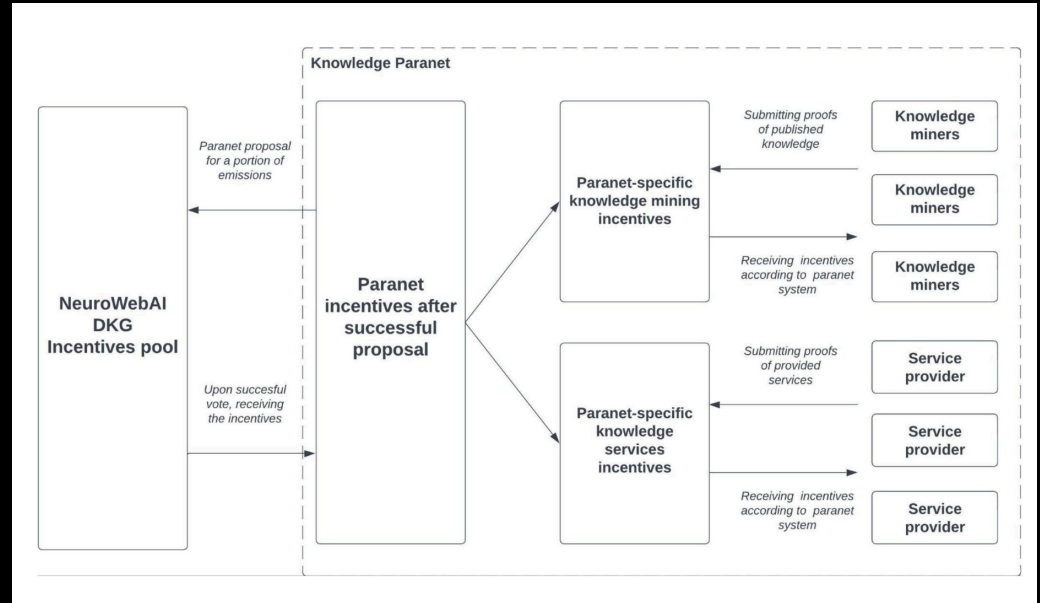


Knowledge Paranets

Collections of Knowledge Assets, AI agents, and services for a specific knowledge category

Choose your own blockchain, services, set of ontologies, incentivisation rules, quality checks, etc.


Submit a governance proposal on NeuroWeb for Neuro incentive emissions



The Verifiable Internet wants you

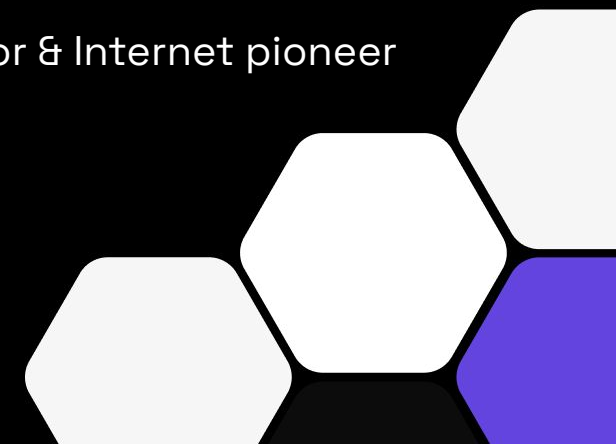
- Start a paranet: propose your idea to the community and get Neuro incentives
- Apply for a ChatDKG developer grant (at <https://chatdkg.ai>)
- Add services and knowledge for DKG paranets
- Run Neuroweb - host blockchain nodes, stake, participate
- Join the community today (Discord link in QR code)





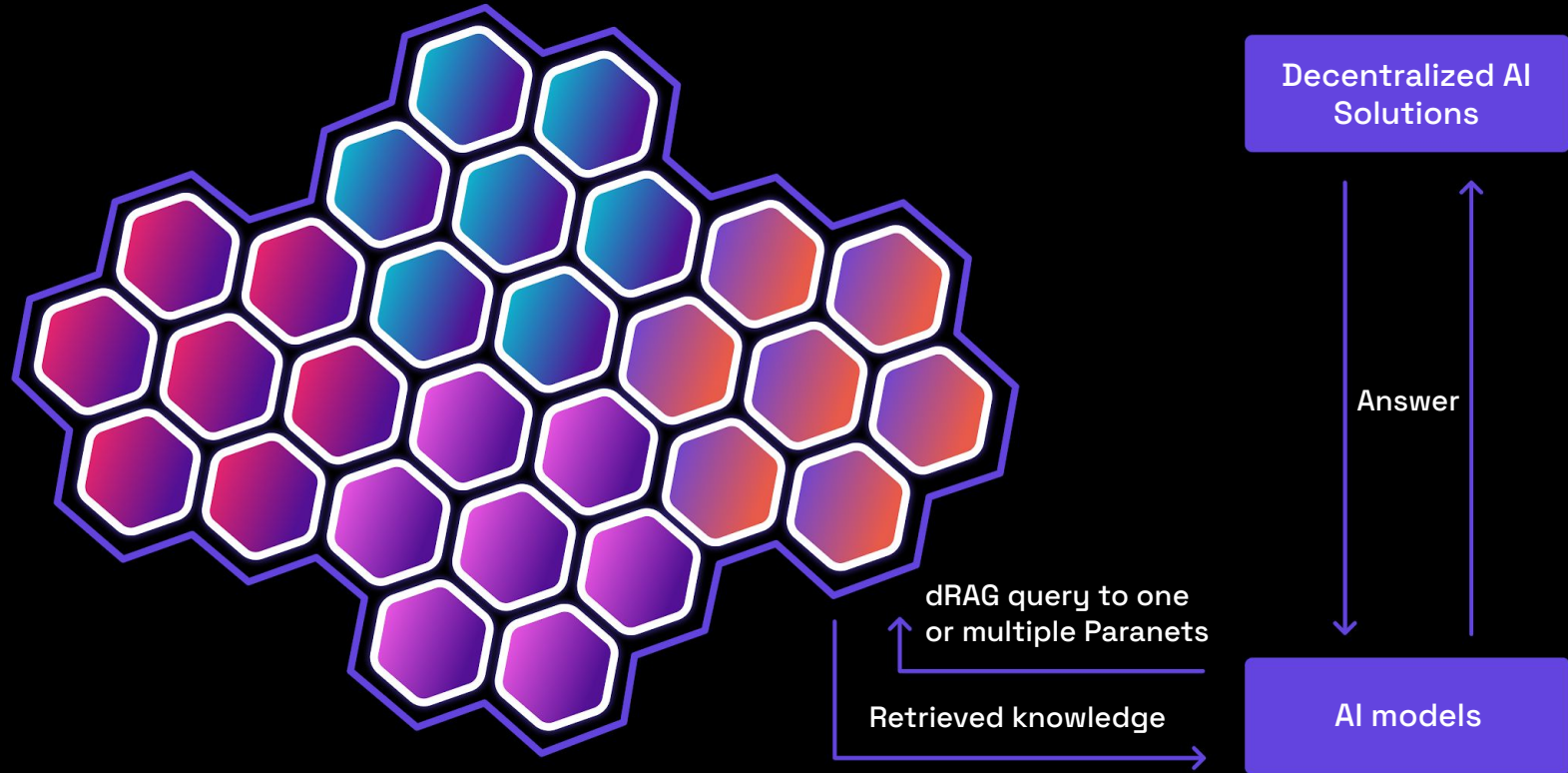
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Dr Bob Metcalfe, Ethernet inventor & Internet pioneer



Backup

OriginTrail DKG: a confederation of Paranets



OriginTrail - Verifiable Web for Decentralized AI



Decentralized Knowledge Graph combines knowledge graph and blockchain technologies, enabling organizations to transform their data into highly connected, interoperable, and **AI-ready Knowledge Assets**

You
What was the composition of Nike's global corporate leadership positions in terms of gender in 2021?

ChatGPT
In 2021, Nike reported progress in terms of gender diversity within its global corporate leadership positions. The company's commitment to diversity, equity, and inclusion has been a focal point in their corporate governance and social responsibility efforts. Specifically, Nike aimed to increase the representation of women and underrepresented groups in leadership roles. Although I can provide general insights based on data up to April 2023, for the most accurate and up-to-date statistics regarding the gender composition of Nike's global corporate leadership in 2021, it would be best to consult Nike's official reports or trusted business and industry analysis sources from that period.

As of my last update, Nike had made public declarations about its goals for diversity and inclusion, including increasing female representation in leadership positions. However, without accessing the specific annual report or diversity and inclusion report from 2021, I can't provide the exact percentages or numbers. These reports typically detail the composition of their workforce, including leadership roles, by gender, ethnicity, and other demographics.

If you're looking for detailed, specific figures from Nike's 2021 corporate leadership gender composition, I recommend checking Nike's official website for their corporate responsibility or sustainability reports, which often include detailed diversity and inclusion metrics.



In 2021, the composition of Nike's global corporate leadership positions in terms of gender was as follows:

- Female: 43.0%
- Male: 57.0%

This information is based on the FY21 NIKE, Inc. Impact Report. For more details, you can refer to the report at NikeUNITED.27.

Want to join the Knowledge Mining beta program on NeuroWebAI?

Email

X handle - mandatory for art minting on X

I would like to participate in Knowledge Mining in the following field(s)

- Art
- Construction and sustainability
- DeSci
- Fintech-related
- OriginTrail and Web3 ecosystems

How can I build a trusted question answering system with OriginTrail?

What is a Knowledge Asset?

Which blockchains can I use with OriginTrail?

UD...

SOURCE KNOWLEDGE ASSETS



Breaking Barriers: FY21 NIKE, Inc....

Issuer: [OriginTrail](#)

[View source content](#)

DKG Explorer

by [OriginTrail](#)

Search by URL or wallet address

[Learn more](#)

← Back

Knowledge Asset profile

Latest update: 07/02/2024

[did:kratos:2043/0_of4089988](#)
Asset OS
Owner: [0x2A8F8_1C38c3d8](#)

Blockchain: OTP Mainnet

URI: [ERC721.NFT](#)

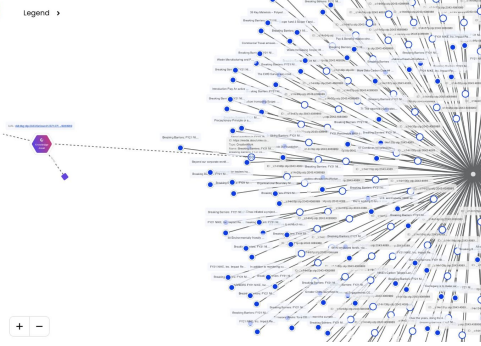
Resources

- [ID: https://media.about.nike.com/files](https://media.about.nike.com/files)
Name: Breaking Barriers: FY21 NIKE, Inc. L.
Type: CreativeWork
- [ID: _c34n69ptop2043-4089989](#)
Type: KnowledgeAssetMetadata

[See all resources](#)

Knowledge Asset status updates

Knowledge Asset created
Block hash: [0a57_202028](#)
Issuer: [0x2A8F8_1C38c3d8](#)
1 day ago



NIKE, Inc. Totals by Gender ^(global/corporate⁶⁰)	FY20		FY21		Change From FY20-21		FY25 Target	
	#	%	#	%	#	% pts	#	%
Gender								
<i>All Employees</i>								
Female	12,286	50.2%	11,805	50.4%	-681	0.3%	50%	
Male	12,205	49.8%	11,411	49.6%	-794	-0.2%		
Total	24,491	100%	23,016	100%	-1,475	0%		
Leadership Positions⁶¹								
Female	163	39.3%	166	43.0%	3	3.7%	45%	
Male	252	60.7%	220	57.0%	-32	-3.7%		
Total	415	100%	386	100%	-29	0%		

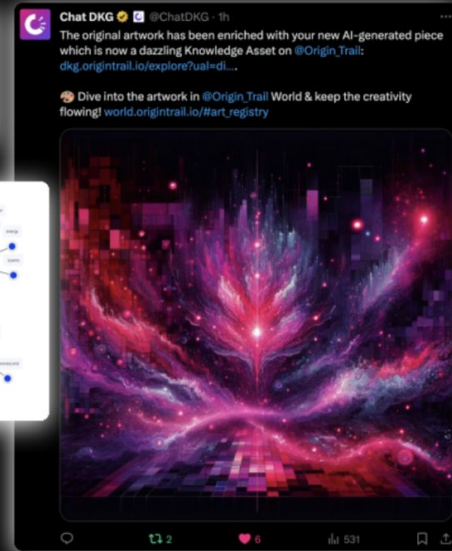
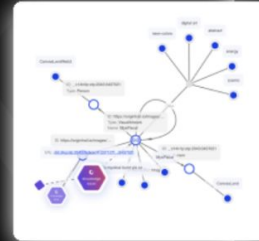
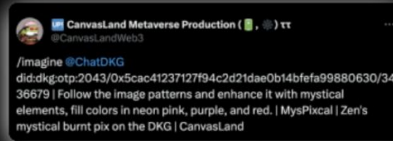
⁶⁰ Corporate is associated with the workforce not directly involved in retail stores, distribution centers or Air Manufacturing Innovation (Air MI).
⁶¹ All employees who are VP level and above are considered leadership positions.

Available now

Knowledge Mining for art

Protect your art, or create new art from existing art pieces by Knowledge Mining through X.

Start here



More categories coming soon!

DeSci

OriginTrail and Web3 ecosystems

Construction and sustainability

Knowledge Mining Kit



Tutorials and resources

ChatDKG tutorials

DKG docs

General SPARQL



Knowledge Mining Tools

SDKs

Local KG tools

Applications

Infra



Collaborative building

Discord channel