



Decentralized
machine learning

EXPLAINER DECK

decentralize data,
processing power and
algorithms for machine learning

www.decentralizedml.com



Enormous Market of Big Data and Machine Learning.

The internet and availability of big datasets are key elements that lead to the recent tremendous development in machine learning.

International Data Corporation (IDC) foresees that the revenue for big data analytics will grow to over US\$210 billion in 2020.

Existing Machine Learning Constraints



1

Inaccessibility of Private Data

Traditional machine learning requires datasets to be uploaded to a dedicated server. Due to privacy concern, massive amount of private data stored in individual devices is untapped.

2

Centralization of Processing Power

Nowadays, machine learning is mainly conducted through a centralized computer, which its processing power is usually limited or confined to the processors of a single machine.

3

Limitation of Algorithms Development

Only large corporations can afford investing huge initial capital and resources to build in-house machine learning algorithms or acquire tailor-made ones from consultancy firms to apply machine learning in their own business.

Decentralized Machine Learning Protocol

Untapped private data usage is unleashed with privacy protection.



Idle processing power of every devices is utilized.



Algorithms are crowdsourced in developer community.

Untapped Private Data

Public and
Private Data
(DML Protocol)

Public Data
(Tech Giants)

USD210B

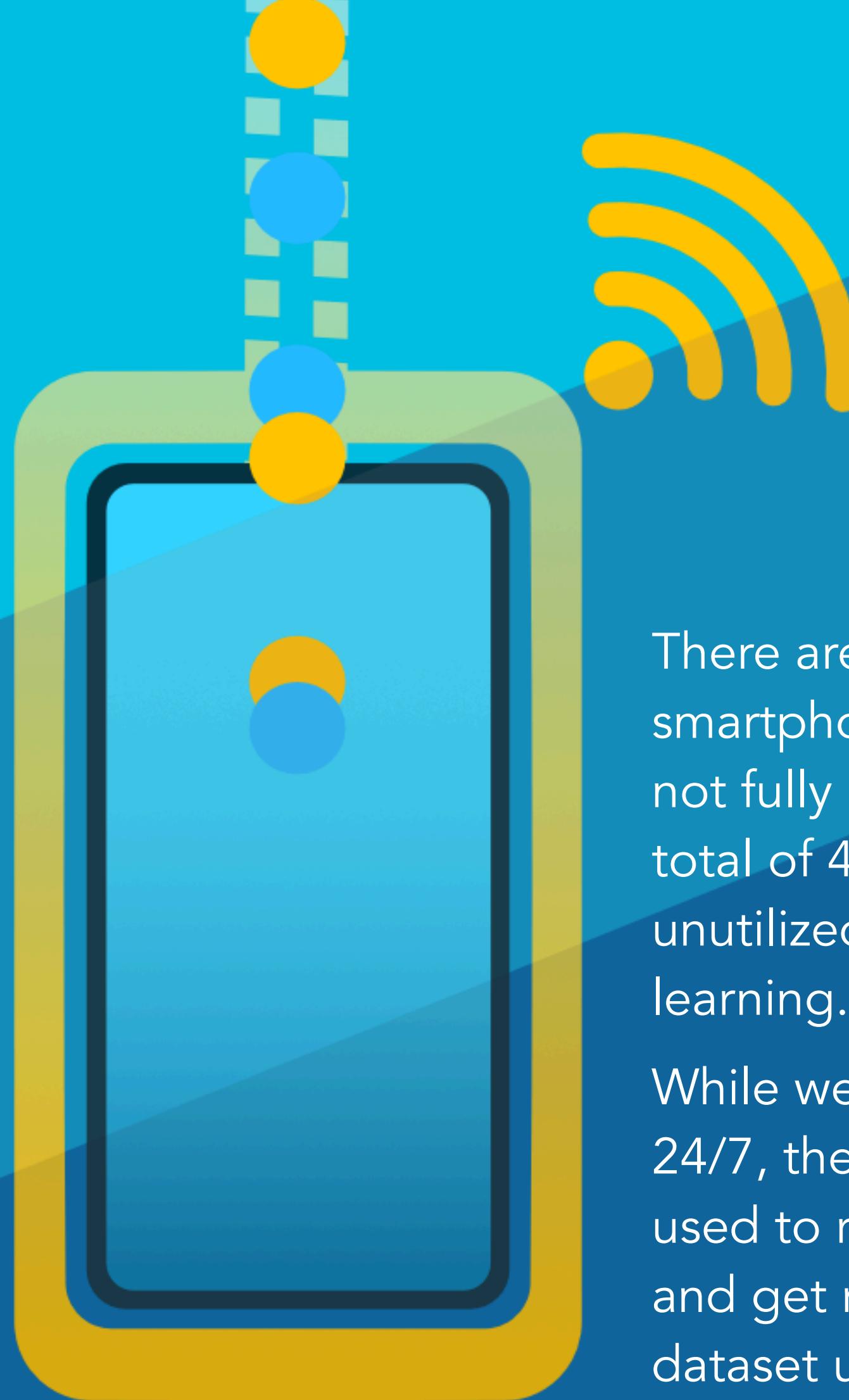


Market potential in machine learning and big data are already being predicted to be enormous. However, existing available datasets are just tip of the iceberg.

If the untapped private data, like the bottom of the iceberg, is being revealed and applied to machine learning, its market potential and revenue generated will be significantly greater.



Idle Processing Power of Devices



There are approximately 2.3 billion of smartphones and 2 billion of PCs that are not fully utilized. This implies that there is a total of 4.3 billion of electronic devices with unutilized processing capacity for machine learning.

While we usually do not use our devices 24/7, the idle processing power can now be used to run machine learning algorithms and get rewarded along with the private dataset usage.

DML Algorithm Marketplace

A machine learning developer community will be built for talented developers to list their algorithms for sale.

Any parties, who want to apply useable applications through machine learning, can locate or request suitable algorithms from the marketplace.

Innovation from periphery are encouraged and enormous potential in machine learning are unleashed through decentralizing the algorithm development.



DML Protocol Participants



Customers

Companies, research institutions, governments or non-governmental organizations request machine learning algorithms for prediction reports.



Algorithm Developers

Create algorithms and request for fine-tuning of algorithms. Algorithm creations are decentralized and crowdsourced in developer community.



Layers of Decentralized Nodes

Distributing Nodes deliver algorithms, **Federated Nodes** aggregate results, **Report Nodes** produce reports and **Algo Refining Nodes** improve algorithms.



Data Owners

Contribute idle processing power and allow access of private datasets of their devices for local prediction results, participate in fine-tuning of algorithms.

DML Protocol Explainer

Algorithm Marketplace

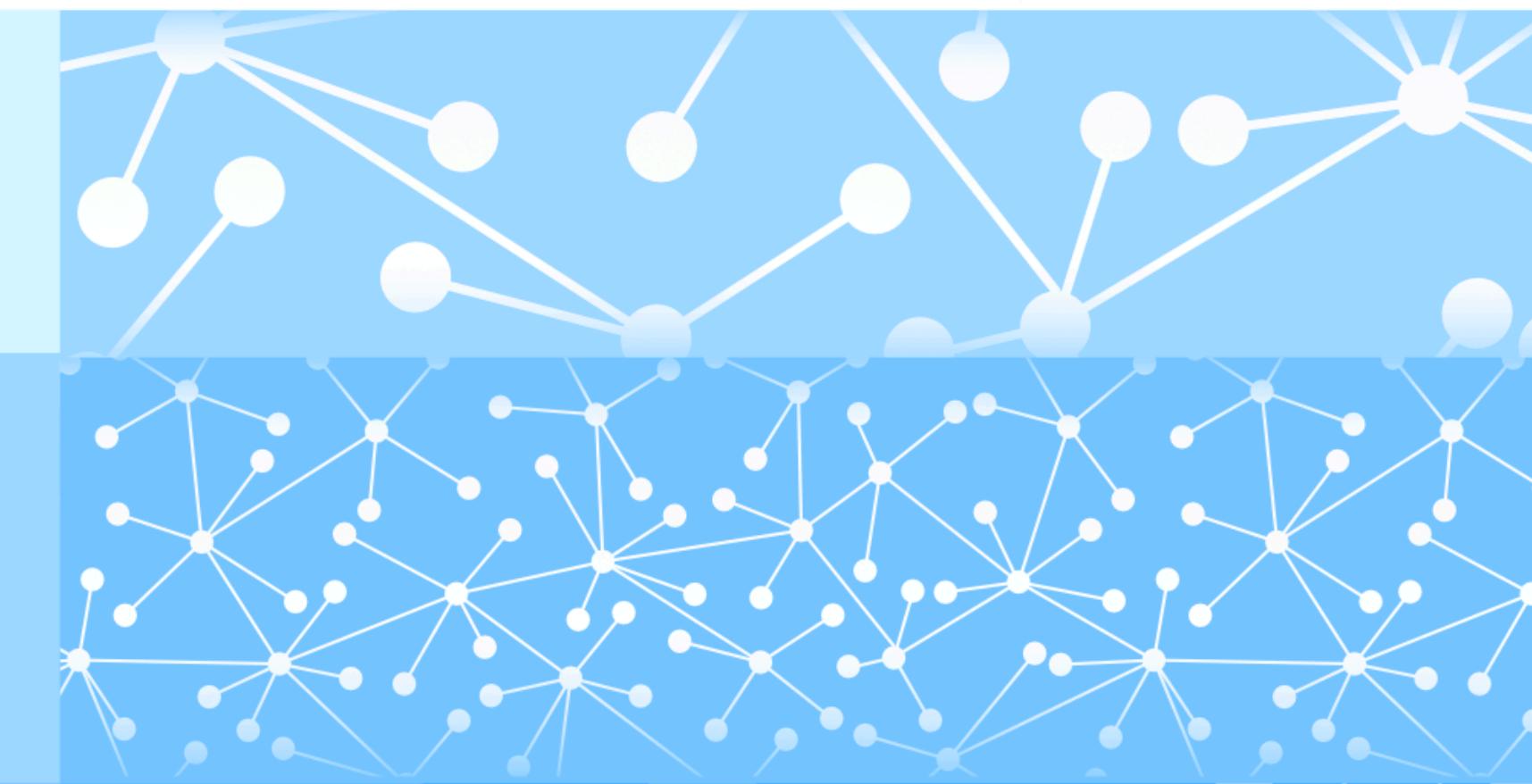
- Customers
- Developer Community



Protocol Customers request machine learning prediction and look for suitable algorithms, or ask for a customized algorithm in our Algorithm Marketplace. The supply of algorithms is crowdsourced in our Developer Community.

Decentralized Nodes

- Report Nodes



Report Nodes further average the encrypted results processed by the Federated Nodes and generate an encrypted final report to the protocol customers. Storage will be in a distributed file system like IPFS.

- Distributing Nodes
- Federated Nodes
- Algo Refining Nodes



Distributing Nodes identify and distribute the encrypted algorithms to individual devices. Federated Nodes collect, aggregate and average all connected local prediction results by Federated Learning. Algo Refining Nodes collect, aggregate and average the updates by algorithm trainers to generate improved algorithms.

Individual Devices

- Smartphones
- Tablets
- PCs

Data owners of Individual Devices can authorize specific types of datasets for algorithms to be run in our DML App. Data will be kept within the devices without transferring to any third parties or being stored in the cloud server. Thus privacy of data will be well protected. They can also allow algorithms to be run on their authorized datasets for participation of algorithms improvement as algorithm trainers.

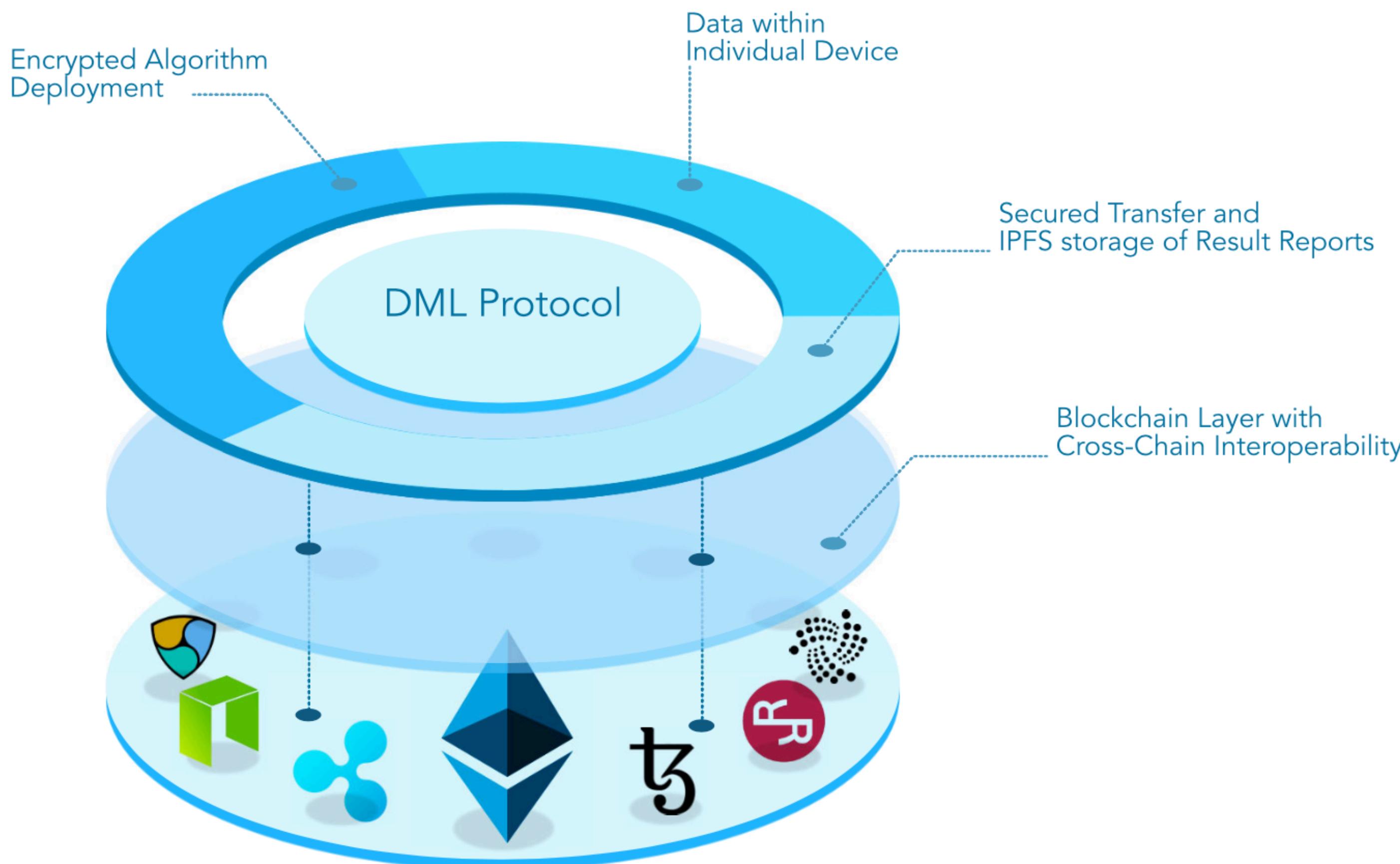
Blockchain Smart Contract



Smart contract is utilized as a trustless and middleman-free tool to facilitate:

- **customers** who request for machine learning service and pay to other participants
- **algorithm developers** who list their algorithms to get paid by protocol customers, and paid to algorithms trainers for improvements
- **decentralized nodes** who are responsible in the process of algorithms distribution and improvements, results aggregation and reports generation
- **data owners** who authorize access for algorithms running on their individual devices, as well as participation of algorithms improvements as algorithms trainers

Cross-chain Compatibility and Interoperability



Our decentralized and open-source blockchain technology allows individual data and intelligence to be joined together to create a collective beneficial ecosystem. We believe such decentralization approach should not be confined to one single blockchain platform.

Therefore, our technology welcomes and encourages all sorts of blockchain technology to be adopted in our protocol and various system languages to be used to run their machine learning model on our network.



Much More Than Predictions...

Machine learning applications is only one of the major use cases for DML protocol.

With a network that connects to billions of electronic devices to unleash the use of previously untapped private data and their idle processing power, it can extend its applications from machine learning algorithms to any other types of programs to be run.

Meet Our Core Team



Victor Cheung

Blockchain Developer

- Founder at 2 tech companies with startup winning awards
- Full stack web, app and smart contract development, proficient in Solidity, C#, JavaScript, Node.js, PHP, MySQL, MFC
- MSc in Computer Science, HKU



Michael Kwok

Project Lead Director

- Founder at 2 tech companies with startup winning awards
- Seasoned growth lead in early stage startups, veteran digital marketer and community manager
- Business development specialty, online branding and SEO expert



Jacky Chan

Blockchain and Software Developer

- Founding engineer at blockchain consultancy firm Kyokan Labs, contributor to Metamask & DFINITY
- Former software developer at Uber
- Early engineer at Symphony Communication acquired by Goldman Sachs, serving Wall Street firms

Meet Our Core Team



Pascal Lejolif

Machine Learning Engineer

- Former CTO at Alkia IT Services, specialize in cloud computing, AI and cyber security services
- Over 8 years as Alcatel-Lucent Enterprise technical project manager
- Machine Learning Certificate, Standford University



Wilson Lau

Machine Learning Engineer

- Technical manager of cryptocurrency mining consulting firm
- Involved in machine learning agriculture robotic system design
- Proficient in Python, C, Mathematica, Arduino



Patrick Sum

System Security Engineer

- Over 20 years IT experience in banking, education sector and semi-government authority
- Software development, system admin, project management, wide-area network design expert
- MBA, AGSM
- BSc (Computer Studies), HKU

Meet Our Advisors



Guillaume Huet

Big Data / Machine Learning Advisor

- 12 years in banking, consulting and business development in Europe, Africa and Asia
- Frequent speaker on data science and machine learning
- MIB, EDHEC Business School
- Specialization Certificate in Machine Learning, Stanford University



Michael Edesess, PhD

Machine Learning Advisor

- Adjunct associate professor for postgraduate course in cryptocurrency, HKUST
- Columnist of MarketWatch (WSJ)
- Chief investment strategist at Compendium Finance
- PhD in Pure Mathematics, Northwestern University
- Bachelor of Philosophy and Mathematics, MIT



Roderik van der Graaf

Blockchain Advisor

- Near 20 years in financial markets, private equity and venture capital
- MD at Caldera Pacific, PE/VC firm
- Involved in crypto assets markets since 2014 as both investor and advisor
- MSc in Information Technology, Queen Mary and Westfield College, University of London
- CAIA holder

Meet Our Advisors



Kyle Wong, PhD

Machine Learning Advisor

- Founder and Chief Operating Officer at Artificial Intelligence Hong Kong
- Advisors of several AI startups
- PhD in Applied Physics, Cornell University
- Fintech Certificate, MIT



Scott Christensen

Machine Learning Advisor

- CEO and Founder at Hanpa Group, high frequency trading company with AI in trading
- Former Head of North American Equity Derivatives Trading, ABN AMRO Bank N.V.
- BSEE, University of Wisconsin



Steven Cody Reynolds

Blockchain Advisor

- Facilitated Binance's rapid rise, managed over 7,000% growth in users to this fastest growing cryptocurrency exchange
- Advisor at HybridBlock, Head of Operations at Akropolis
- Founder at Greychain Capital, specializes in digital asset management

Meet Our Advisors



Matthew Slipper

Machine Learning Advisor

- Co-founder and CTO at Kyokan Labs, contributor to Machinomy
- Former co-founder and CTO at Spectrum Labs, an investor-backed machine learning startup
- Early engineer at Symphony Communication, serving Wall Street firms



Jesmer Wong

Machine Learning Advisor

- Data Scientist for Predictive Analytics, Data Visualization and Automation for company initiatives
- MBA, Chinese University Hong Kong
- Deep Learning Nanodegree, Udacity and Certificate in Data Science, General Assembly



Eugene Tay

PR & Marketing Advisor

- Founder of CryptoCentral.net with over 15 years experience in strategic business development
- Frequent speaker and key opinion leader in South East Asian crypto community
- BSc (Hons) in Computer Engineering, Nottingham Trent University

Meet Our Advisors



Eric Byron

Business Advisor

- More than 25 years experience in IT industry
- Worked for Disney in the US and spent 6 years with Electronic Arts (EA Sports)
- Strategic Advisor for Accelerate, a data-driven socially aligned tech education startup



Fabrice Fischer

Business Advisor

- Founder and CEO of Blu, an Artificial Intelligence advisory firm
- Former CFO of Sentient Technologies, one of the world's best funded AI outfits
- MBA, INSEAD and Bachelor in Electrical Engineering, University of Montreal

Working Partners





Explore Our Decentralized Machine Learning Protocol

decentralizedml.com