2023

PRODUCT CATALOG

Patent/Technology Licensing . Technology Consultant . Software Customization
Proprietary Platforms . Technical Collaboration

Quantum Computing
Networking Communication
Artificial Intelligence

阿證科技

AhP - Tech Inc.

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阿證科技
AhP - Tech Inc.

Patent / Technology Licensing

Based on our current royalty policy, the service of patent licensing will be focused on the following area:

- **US**
- **Taiwan**

Field of Licensing Technology:

- **Artificial Intelligence**
- **5G wireless broadband technology networks**
- **Big data technology**
- **Quantum cyber security**
  (including 6G/7G communication)

2021~2023
US
Certificated Patents

阿證科技
AhP - Tech Inc.

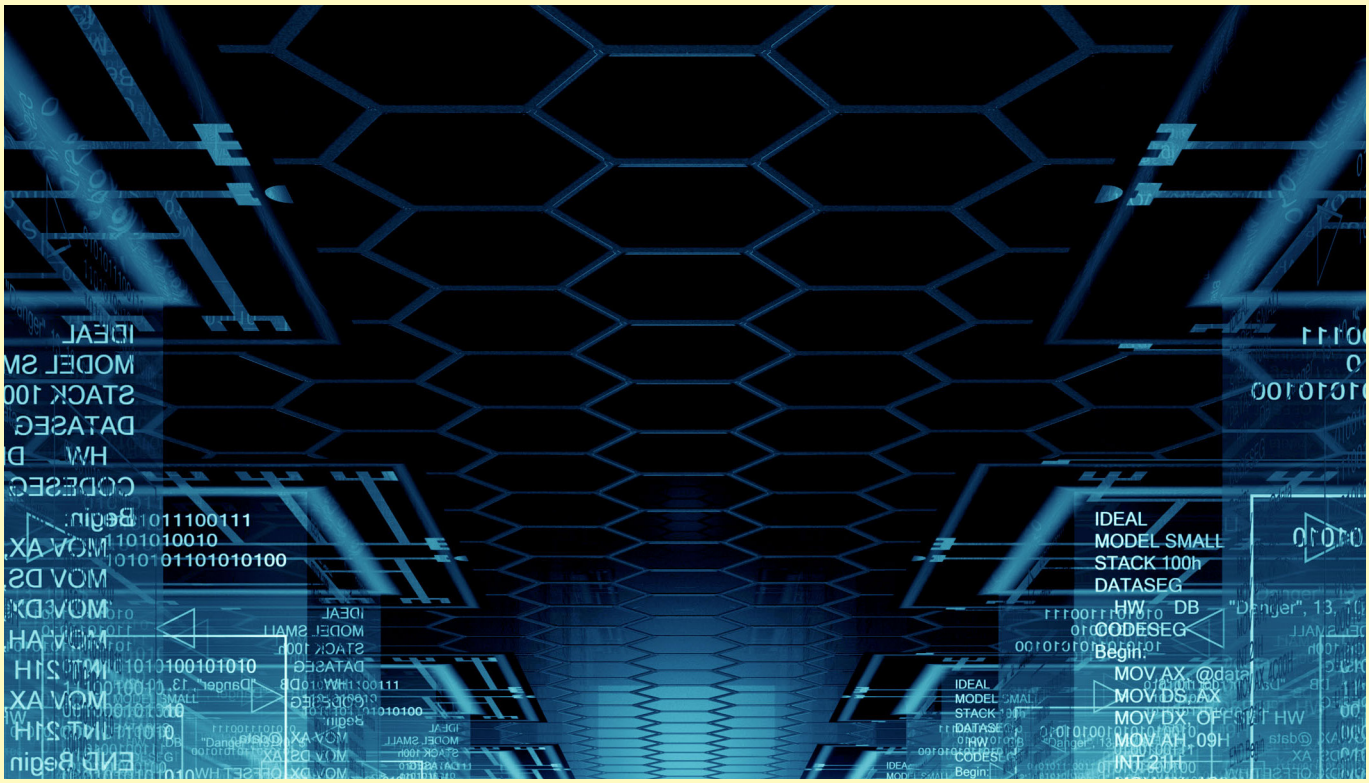
Software Customization

We provide service of software customization for customers registered in the following regions:

- **US**
- **EU**
- **Taiwan**

Field of Software Customization:

- **Embedded system**
- **AIoT**
- **Cloud computing IT and application systems**
- **Artificial Intelligence decision-making system**



阿證科技
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Technology Consultant

We provide technology consulting by hours for customers registered in the following regions:

- **US**
- **EU**
- **Taiwan**

Field of Technology Consulting:

- **Computer software design**
- **Data security**
- **Artificial Intelligence**
- **5G wireless broadband technology networks**
- **Quantum computing (including 6G/7G communication)**
- **Big data analysis**

Contact us
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Topic 1

Have you already experienced the next generation artificial-intelligence decision-making system?

McKinsey Global Institute says that by 2030, around 70 percent of companies are adopting at least one of AI (artificial-intelligence) technologies, and less than half of all large companies will have a full scope of AI technology embedded in their organization processes. Netting out competition effects and transition costs, AI could potentially deliver additional global economic output up to around $13 trillion which boosts global GDP by about 1.2 percent a year.

An advantage provided by neuro-network is its ability to make decisions. By leveraging datasets with AI, it facilitates businesses or companies to make efficient, consistent, and accurate decisions. While examining a situation, human analyze many factors both emotionally and practically, but AI-powered machine usually gives a single result as it is programmed to make specific modeled decisions in real time.

There are many successful and failed stories about utilizing artificial-

intelligence decision-making systems in different industries, and the challenge will be more complicated than what we expect in the era of information explosion at present. How to organize an architecture model of AI-decision engine would be a critical issue.

At present, most of conventional artificial-intelligence decision-making systems are applied with a single neural-network topology, and the data structures adopted by the neurons arranged and configured in the neural network are usually traditional linear data structures. It makes the decision-making system not applicable to different scenarios based on the same data source, and cannot provide decision-making results with multiple dimensions or styles for advanced commercial applications.

Thus, our task force pays more attention on the development of an architecture model with creativity, flexibility, durability and robustness. One of our goals is for utilizing the same data source to support various decision-making scenarios in efficiency. It involves complicated know-how which includes switching to different neuro-networking topologies in time and keeping a neuro-networking topology being stayed in an applicable state.

The AhP-Tech Decision Making Core-system (called **ADMC** hereafter) integrates tree-structured neurons for supporting multiple data dimensions and a state-recovery mechanism to fix failed training rounds. Wherein the tree-structured neurons facilitate neuro-networking switching processes and the state-recovery mechanism facilitates to hold an applicable neuro-networking topology. The **ADMC** is implemented into an SDN (Software Defined Network) infrastructure, while data transmissions between subsystems can be implemented with NFV (network functions virtualization) components including virtual router for data transmission channels between different virtual network segments.

Based on such a platformed SDN infrastructure, the services provided by **ADMC** are not only easy to fulfill the state switching process, but also quick to switch different neuro-networking topologies from different devices. Multiple AI engines deployed into ADMC can be implemented to a variety of packaged VMs for supporting raw data from external non-specific models.

Above is part of story about ADMC from the view of its networking topologies. If possible and you are still interested in this topic, welcome to visit **www.ahptech.com.tw** for leveraging our services to enhance your enterprise's computing power and cyber security for the coming **Quantum-AI** era.

Topic 2

Is your artificial intelligence decision-making system safe and robust?

Most of conventional artificial-intelligence decision-making systems created with similar topologies usually generate results in similar decision-making styles, meanwhile it is difficult to change the native topologies to be applied for data with other features.

Normally, such decision-making system could be vulnerable to be learned by an external AI engine. In fact, there is a kind of threats called "**model extraction attack**" which steals an exposed machine learning model via querying the model's public API repeatedly and tuning an external model based on obtained predictions.

Moreover, data pre-processing is another key vulnerable point for training a decision-making model. In several cases, there's cyber security issue for storing an uploaded data source. Besides, there would be also robust issue if the quality of back-propagated data is not stable and applicable enough.

Therefore, the AhP-Tech Decision Making Core-system (called **ADMC** hereafter) is especially designed with some risk-avoidance mechanisms.

For example, to support data safe storage, **ADMC** adopts a random-storage mechanism to divide the uploaded data into fragmental pieces so as to put them into an SSD array with a random-storage algorithm. Implementing such storage mechanism into an SDN infrastructure with a plurality of virtual servers will extremely improve the security of data retention for the valuable raw data.

Further, for optimizing the back-propagated data, **ADMC** integrates technologies including tensor analysis, functional operations, and stationary filters to support time-variant data, boost loss functions, and rework noisy data.

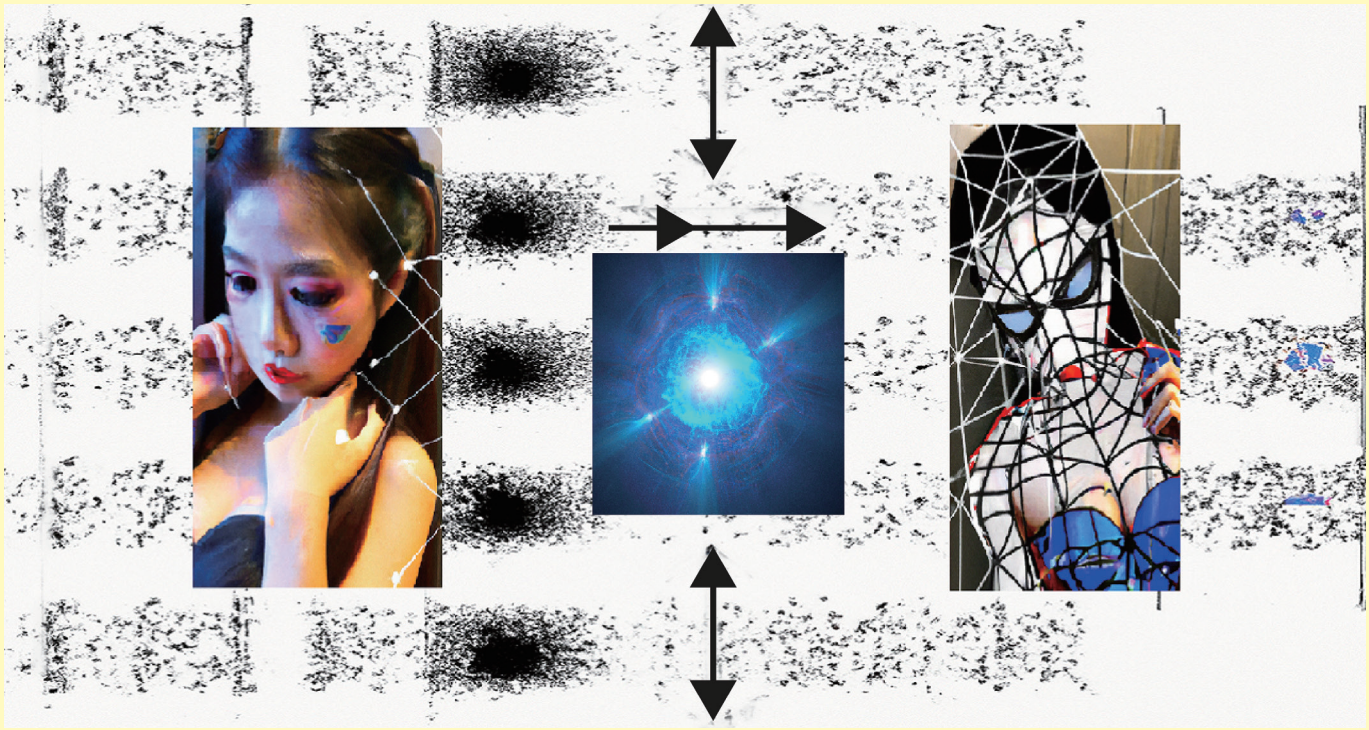
Moreover, for the raw data which is out of a Euclidean space, **ADMC** also provides a data refining mechanism to integrate technologies including dynamic norm introduction, inner product processing, and operations of Riemannian geometry so as to enhance data pre-processing for facilitating data usability.

Once such designs for refining the input data and optimizing the back-propagated data work with the neuro-networking switching processes already mentioned in last topic, the **ADMC** will not only be capable of working on various user scenarios based on the same data source, but also be capable of changing decision-making styles dynamically so as to avoid the trained model being learned by an external AI engine and keeping the output data applicable.

In other words, the risk-avoidance mechanisms adopted by **ADMC** prevent an AI decision-making platform from model extraction attack meanwhile raise up data usability as well. Welcome to visit our official site **www.ahptech.com.tw** for more information about services provided by AhP-Tech. The team is always ready for you in Taiwan to provide you a safe and robust AI platform.

Topic 3

Do we have enough know-how to protect an AI engine meanwhile to support kinds of featured data?



Why we have to integrate technologies comprising neuron grouping management, dynamic neural networking topologies, and a state-recovery mechanism within a decision-making system? Here we try to introduce more details about how the creative designs applied on **ADMC** (AhP-Tech Decision Making Core-system) to protect its AI engines and also facilitate the usability of quantum data.

First, there is a "**Neuron Grouping Management Mechanism**" designed for **ADMC**, thereby the **ADMC** will be capable of re-arranging neural networks based on the attributes of data. Further, such design will enhance **ADMC** to support a multiple-engine scheme wherein each engine integrated in this scheme operates its distinguished and characterized neural networking topology according to its corresponding grouping data attributes. The **ADMC** can be switched to various networking topologies dynamically based on the required grouping policy.

Moreover, in order to conquer a critical threat called "**Catastrophic Forgetting**", a "**State Recovering & Switching Mechanism**" is designed for ADMC as well. Whenever such a disaster comes, this mechanism will be capable of breaking training processes in time according to the residual results, thereafter returning to an applicable networking topology state.

Besides, there are several kinds of dimensional evasion attacks to conventional AI engines. For example, targeting on known vulnerabilities of some dimensional scaling algorithms for AI engines, some customized 3-D inputs may make a 2-D modeled engine output some wrong prediction. That's why we develop tree-structured neurons and the **Neuron Grouping Management Mechanism** collaborating with an optimized activation scheme for **ADMC**, so as to switch the neurons to a space of an applicable data dimension working with a proper neural networking topology thereby dealing with such dimensional evasion attacks.

Further, for some special quantum cases, the above-mentioned optimized activation scheme also integrates technologies including harmonic-function mapping, probability simulating for many-body quantum, and time-variable importing; so as to support featured data with attributes of complex number, quantum many-body system, or time evolution. That especially facilitates usability of quantum data.

In brief, **ADMC** can be deployed as packaged SDN kits with multiple AI engines to support multiple data dimensional spaces and accept kinds of featured data as well. Meanwhile, it also works with an advanced AI protection scheme to avoid **side-channel AI hacks**. Welcome to visit our official site **www.ahptech.com.tw** for more information about services provided by **AhP-Tech**. Any possible collaboration relationship will be our pleasure.

Star Product

AhP-Tech Decision Making Core-system

The arts of ADMC are based on the certificated patents US11580404B2/US11526726B2 including the following features:

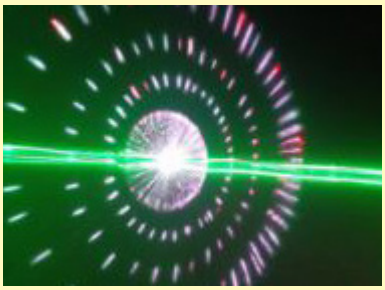
►Advanced System Deployment Infrastructure

- Applicable to different scenarios based on the same data source
- Providing decision-making results with multiple dimensions or styles for advanced commercial applications
- Integrating tree-structured neurons for supporting multiple data dimensions and a state-recovery mechanism to fix failed training rounds
- Implemented into an SDN (Software Defined Network) infrastructure with NFVs to support flexible deployment for public / private clouds

►Decision-Making Cores Implemented by Multiple Engines

- Being capable of changing decision-making styles dynamically
- Being capable of working on various user scenarios based on the same data source
- To avoid the trained model being learned by an external AI engine

▶ High-Applicability Data Processing Mechanism



- Secured data pre-processing mechanism
- Optimization mechanism for backpropagated data
- Facilitating the usability of quantum data

▶ High-Availability AI Decision-Making PaaS

- Implementing a “State Recovering & Switching Mechanism” to conquer the critical threat of “Catastrophic Forgetting”

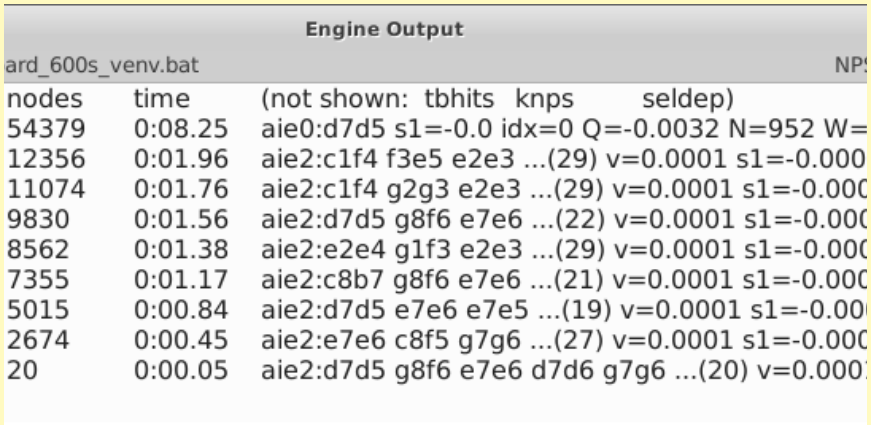
▶ Feasible Scenarios of ADMC:

- Operation of Enterprises
- Management of Customer Relationship
- Policy Planning
- Evaluation for System Performance
- Solution for Bottleneck

▶ Applicable Industrial Fields of ADMC:

- Factory Control & Management
- AI Healthcare
- Smart City
- AIoT
- E-Business
- Bio-Tech Sifter/Filter
- Medical AOI

▶ Demonstration as a Chess Master:



Flagship Product

AhP-Tech Quantum Computing Cloud Platform

The AQCCP is a PaaS established by AhP-Tech wherein this PaaS comprises the following components:

►Patented Quantum Hash Table Core System

- ■ Implementation of True Random Oracle Mechanism
- ■ Operations of Space Mapping for Dynamic Scaling
- ■ Arts of Borel Measure / Lebesgue Measure for Real-Time Hash Generator
- ■ Hash Collision Avoidance
- ■ In-Memory Processing and Database Storage Powered by Volt Active Data

►OTP Access Control Management System

- ■ QR Code Derived from Quantum Hash Generator as OTP
- ■ Man-In-Middle Attack Resistant
- ■ Rainbow Table Attack Resistant
- ■ No Secret Door Function to Be Cracked

▶Security Enhancement Engine for Symmetric Keys

- Patented Q-Secured Key Enhancement Engine
- Q-Scramble Adopted
- Q-Padding Adopted
- Q-Encryption Adopted
- Side-Channel Attack Resistant

▶PGP Key Management Service

- Invisible Key Storage
- Secured Key Retrieve
- Secured Key Sharing
- Data Loss Prevention Adopted
- Mobile Device Supported

▶Extreme-Secure Delivery

- Digital Signature Adopted
- Patented Q-Secured Key Adopted
- Secured-File-Vault Mechanism

▶Shorten Q-URL Generator/Manager

- Q-Hash Adopted

▶VQE Services

- IBM Q-bits Adopted
- REST API for Hamiltonian Input
- Patented Multiple AI Engines as Eigen-Value Accelerator
- Generic Usage for Various Industrial Fields

Flagship Product

Welcome to visit

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Proprietary Platforms

Technical Collaboration

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