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Outline of Patent Applications for AI-related Inventions in China

In recent years, innovations of artificial intelligence (hereinafter referred to as AI) technologies have continuously achieved new breakthroughs, becoming a significant driving force in the new round of technological revolution and industrial transformation. The number of AI-related patent applications has grown rapidly. In response to this, at the end of 2024, the National Intellectual Property Administration of China (CNIPA) released the "Guidelines for Patent Applications for AI-related Inventions (Trial)" (hereinafter referred to as the "Guidelines"). These guidelines provide a comprehensive and in-depth interpretation of the patent examination policy in the field of AI under the framework of China's current patent legal system, addressing the hot legal issues commonly concerned by innovation entities. Below is an introduction to the main content of the Guidelines:

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I. Common Types of AI-Related Patent Applications

The solutions for patent applications for AI-related inventions (hereinafter referred to as AI applications) typically involve AI algorithms or models, as well as the functions or field applications of these algorithms or models. Furthermore, with the continuous breakthroughs in AI technology, patent applications relating to AI-assisted or AI-generated inventions have become new hotspots. AI applications are mainly classified into the following types:

Type 1: Patent Applications Relating to AI Algorithms or Models per se

This type of patent applications usually involves AI algorithms or models per se and their improvements or optimizations, such as model structure, model compression, or model training.

Type 2: Patent Applications Relating to Functions or Field Applications based on AI Algorithms or Models

This type of patent applications integrates AI algorithms or models into inventions as an integral part of the solutions for products, methods, or their improvements. In other words, one or more AI algorithms or models are used to implement functions or apply AI to various scenarios, for example, a new type of electron microscope based on AI image sharpening technology, or the application of AI in transportation, telecommunications, or other fields.

Type 3: Patent Applications Relating to AI-assisted Inventions

AI-assisted inventions refer to invention-creations made with AI technology as an auxiliary tool during the inventing process, wherein AI functions similarly to an information processor or drawing tool, for example, a new drug compound obtained by utilizing AI to identify specific protein binding sites.

Type 4: Patent Applications Relating to AI-generated Inventions

AI-generated inventions refer to invention-creations autonomously generated by AI

without substantial human contribution, for example, a food container autonomously designed by AI technology.

[Note: According to the "FAQs" released concurrently by the CNIPA, the above four types are classified based on the different "roles" played by AI in invention-creations. Among them, "Type 1" and "Type 2" are distinguished based on the different objects of protection for the solutions, while "Type 3" and "Type 4" are distinguished based on whether a natural person has made substantial contributions, as shown in the figure below:]

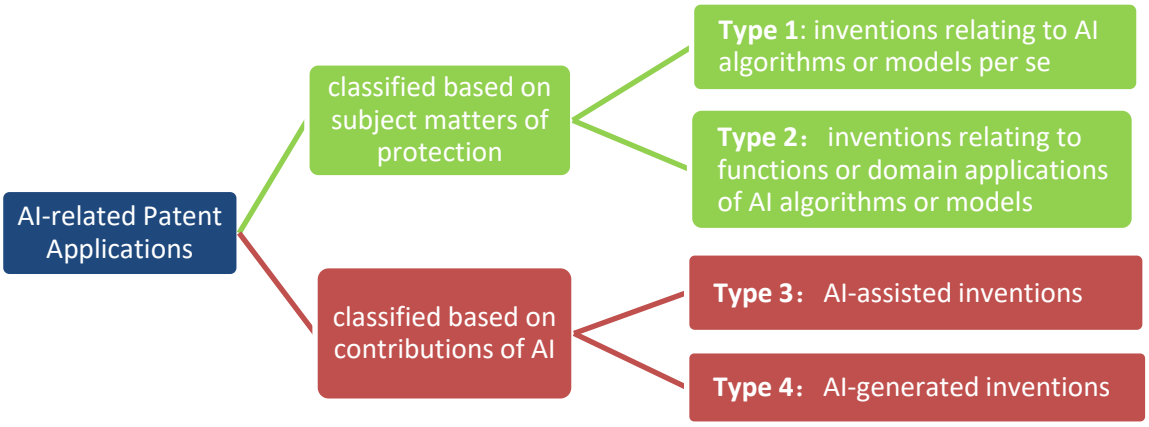

Figure 1: Types of AI Applications

II. Hot Legal Issues Concerning AI-Related Patent Applications

With the rapid iterative development of AI technology, different types of AI-related patent applications involve various legal issues at each stage of patent examination and approval. For the aforementioned four types of AI applications, common legal issues include inventorship issues for Types 3 and 4, subject matter eligibility, sufficient disclosure, and inventiveness issues for Types 1 and 2, as well as AI ethics issues that all these types of patent applications may face. The following elaborates on these hot-button legal issues and specific considerations.

1. Eligibility of Inventors

The Implementing Regulations of the Patent Law stipulates that "inventor" referred to in the Patent Law means any person who makes creative contributions to the substantive features of an invention-creation. The Guidelines confirms that the inventor named in a patent document must be a natural person, and AI systems and other non-natural persons cannot be listed as inventors. When there are multiple inventors, each one must be a natural person. Currently, AI systems cannot enjoy civil rights as civil subjects and therefore cannot serve as inventors.

For patent applications of Types 1 and 2, inventor refers to the person who has made creative contributions to the substantive features of the invention-creation.

For Type 3, a natural person who has made creative contributions to the substantive features of the invention-creation may be named as the inventor in the patent application. For Type 4, under the current legal framework in China, AI cannot be granted inventor status.

2. Judgment on Subject Matters of AI Applications

The judgment on subject matters of AI applications typically involves applications of Type 1 and Type 2. The subject matter judgment consists of two steps. The first step involves determining whether the solution falls under "rules and methods for mental activities". If it passes the first step, whether the solution qualifies as a "technical solution" will be further examined in the second step.

2.1 First Step: Judgment on "Rules and Methods for Mental Activities"

Article 25(1)(ii) of the Patent Law stipulates that no patent shall be granted for "rules and methods for mental activities". If a claim includes both rules and methods for mental activities and technical features, and these technical features are not merely reflected in the subject matter, then the claim, as a whole, does not constitute a rule or method for mental activities.

If the claims of a patent application involving AI algorithms or models (i.e., Type 1) solely relate to abstract mathematical theories or algorithms without any technical features, they belong to rules and methods for mental activities and cannot be granted a

patent. *For instance, a method for establishing a general neural network model based on abstract algorithms without any technical features, or a method for training a general neural network using an optimized loss function to accelerate training convergence without any technical features, is considered an abstract mathematical algorithm and belongs to rules and methods for mental activities.*

To avoid or overcome the defect that a solution is deemed a rule or method for mental activities, applicants can include technical features associated with the algorithmic features into the claims, so that the claims, as a whole, do not constitute a rule or method for mental activities. *Take for example a claim relating to a processing method of an AI model, wherein the characterizing portion explicitly states that the method is executed by an AI chip.* Since the overall solution describes the hardware environment in which the method is executed, and this hardware environment constitutes a technical feature, the solution of the claim as a whole does not belong to rules and methods for mental activities. *Another example is a claim relating to a processing method of a neural network model, wherein it is explicitly stated that the method is used for processing and classifying images.* Since processing and classifying image data are technical features, the solution of the claim as a whole also does not belong to rules and methods for mental activities.

2.2 Second Step: Judgment on “Technical Solution”

Even if the solution of a claim no longer belongs to rules and methods for intellectual activities, to qualify as a patentable subject matter, it must also meet the requirements for a "technical solution" stipulated in Article 2(2) of the Patent Law.

The "technical solution" referred to in Article 2(2) of the Patent Law refers to a collection of technical means that utilize natural laws to solve technical problems. When a claim describes the adoption of technical means that utilize natural laws to solve a technical problem and thereby achieve technical effects in line with natural laws, the solution defined by that claim constitutes a technical solution. Conversely, a solution that does not adopt technical means that utilize natural laws to solve technical problems and achieve technical effects in line with natural laws does not constitute a technical solution.

Several common circumstances that constitute technical solutions are outlined below:

Circumstance A: What is processed by AI algorithms or models is data with precise technical meanings in technical fields

If a claim is drafted to demonstrate that the object processed by an AI algorithm or model is data with precise technical meanings in technical fields, such that based on the understanding of a person skilled in the art, it can be discerned that the execution of the algorithm or model directly embodies the process of utilizing natural laws to solve a particular technical problem and achieves technical effects, then the solution defined by that claim constitutes a technical solution.

Take for example a method for identifying and classifying images using a neural network model. Image data belongs to data with precise technical meanings in technical fields. If a person skilled in the art can understand that the various steps of processing image features in the solution are closely related to the technical problem to be solved, i.e. identifying and classifying objects, and achieve corresponding technical effects, then this solution constitutes a technical solution.

Circumstance B: There is a specific technical correlation between AI algorithms or models and internal structures of computer systems

If a claim is drafted to demonstrate a specific technical correlation between AI algorithms or models and the internal structures of computer systems, thereby solving a technical problem of how to enhance hardware computational efficiency or execution effectiveness, including reducing data storage volume, minimizing data transmission volume, and increasing hardware processing speed, etc., and achieving technical effects of improving internal performance of computer systems in line with natural laws, then the solution defined by the claim constitutes a technical solution.

This specific technical correlation reflects the mutual adaptation and coordination at the technical implementation level between algorithmic features and the features relating to the internal structures of computer systems, such as adjusting the architecture or related parameters of a computer system to support the operation of specific algorithms or models, making adaptive improvements to algorithms or models tailored to the internal structures or parameters of specific computer systems, or the combination of both.

For instance, a neural network model compression method for memristor accelerators, comprising: Step 1, obtaining a regularized sparse model adapted to memristor arrays by adjusting pruning granularity with respect to the actual array size of memristors using an array-aware regularized incremental pruning algorithm during network pruning; Step 2, reducing ADC precision requirements and the number of low-resistance devices in memristor arrays through a power-of-two quantization algorithm to decrease overall system power consumption.

Specific technical correlation does not necessarily imply changes to the hardware structure of computer systems. For solutions involving AI algorithms improvements, even if the hardware structure of the computer system remains unchanged, the solution as a whole can still achieve technical effects of improving internal performance of the computer system by optimizing system resource allocation. In such cases, it can be considered that there is a specific technical correlation between the features of AI algorithms and the internal structures of computer systems, enhancing hardware execution effectiveness.

For example, a training method for deep neural network models, comprising: when the size of training data changes, with respect to changed data, calculating the training time for the changed training data in preset candidate training schemes respectively; from among the preset candidate training schemes, selecting the training scheme with the shortest training time as the optimal training scheme for the changed training data, the candidate training schemes including single-processor training schemes and data-parallel multi-processor training schemes; and conducting model training on the changed training data using the optimal training scheme.

However, if a claim merely utilizes a computer system as a carrier for implementing AI algorithms or models without demonstrating a specific technical correlation between algorithmic features and the internal structures of the computer system, it does not fall within the scope of circumstance B.

For instance, a computer system for training neural networks, comprising a memory and a processor, wherein the memory stores instructions and the processor reads instructions to train neural networks using an optimized loss function.

Circumstance C: Intrinsic correlation that conforms to natural laws between big data of specific application fields is mined based on AI algorithms

When AI algorithms or models are applied in various fields, they can perform data analysis, evaluation, prediction, or recommendation, etc. For such applications, if the claims indicate that the processed data is big data from specific application fields, and AI algorithms such as neural networks are used to mine the intrinsic correlation that conform to natural laws between the data, solving the technical problem of how to enhance the reliability or accuracy of big data analysis in specific application fields and achieving corresponding technical effects, then the solution described in the claims constitutes a technical solution.

The use of AI algorithms or models for data mining and training AI models that can produce output results based on input data does not directly constitute a technical means. Only when the intrinsic correlation between the data mined based on AI algorithms or models conform to natural laws, can the relevant means as a whole constitute a technical means that utilizes natural laws. Therefore, it is necessary to specify in the solution described in the claims which indicators/parameters are used to reflect the characteristics of the analyzed object to obtain analysis results, and whether the intrinsic correlation between these indicators/parameters (model inputs) and result data (model outputs) mined using AI algorithms or models conform to natural laws.

For example, a food safety risk prediction method comprising acquiring and analyzing historical food safety risk events to obtain head entity data and tail entity data representing food ingredients, edible items, and toxic substances detected in food samples, along with their corresponding timestamp data; constructing a corresponding quadruplet data and form a corresponding knowledge graph based on the head entity data, the corresponding tail entity data, and the corresponding entity relationships with timestamped data representing various hazard levels, risks, or interventions; using the knowledge graph to train a preset neural network to obtain a food safety knowledge graph model; predicting food safety risks at the time to be predicted based on the food safety knowledge graph model.

If the intrinsic correlation between the indicators/parameters and the prediction results mined using AI algorithms or models is solely governed by economic or social laws,

it falls under the circumstance of not conforming to natural laws. *For instance, a method of using a neural network to estimate regional economic prosperity indices, which mines the intrinsic correlation between economic data, electricity consumption data, and economic prosperity indices using a neural network, and predicts regional economic prosperity indices based on the correlation.* Since the intrinsic correlation between economic data, electricity consumption data, and economic prosperity indices are governed by economic laws rather than natural laws, this solution does not utilize technical means and thus does not constitute a technical solution.

To avoid or overcome the defect of not constituting a technical solution, for AI-related applications, applicants can refer to circumstances A-C mentioned above when drafting their application documents and elaborate in the original specification on the technical problem to be solved, the technical means adopted, and the technical effects achievable by the solution. Alternatively, when responding to examination opinions, applicants can amend the claims based on the original application documents and fully explain in the observations why the amended solution constitutes a technical solution.

For example, if involving abstract AI algorithms or models, the claims can indicate that the algorithms or models process data such as text, images, audio, or video with precise technical meanings in technical fields, and thus a person skilled in the art understands that the execution of the algorithms can directly reflect the process of utilizing natural laws to solve a technical problem in the field and achieve technical effects.

For another example, when an invention involves improvements in internal performance of a computer system, technical features from the original application document that demonstrate a specific technical correlation between the algorithm and the internal structure of the computer system can be incorporated into the claims. For instance, in a claim relating to a neural network training method, the applicant may add features such as resource allocation or information exchange among distributed computing nodes that have a specific technical correlation with the neural network training algorithm when a distributed system is used for neural network training, thereby demonstrating that the solution can improve the execution efficiency of the hardware during training and achieve technical effects that conform to natural laws, i.e. improvements in the internal performance of the computer system.

Furthermore, for solutions involving the use of AI algorithms or models to analyze, predict, evaluate, or assess big data in specific application fields, the claims should clearly specify which indicators and parameters are used, which algorithm or model is employed to obtain which prediction results. When responding to examination opinions, emphasis should be placed on analyzing why the correlation between the data processed by the algorithm or model and the results to be analyzed and predicted is constrained by natural laws rather than solely reflecting non-natural laws such as management or economics.

3. Requirements for Sufficient Disclosure of Specifications

The issue of transparency in AI algorithms or models has been receiving widespread attention. On the one hand, during the process from data input to output, their internal reasoning and decision-making processes are not easily interpretable. On the other hand, even if the same model and parameters are used, it is difficult to produce the expected results. Therefore, how to meet the requirements for sufficient disclosure of specifications and thereby enhance the transparency and interpretability of AI algorithms or models is also an important aspect of AI application examination.

The specification of an AI application should clearly record the technical solution of the invention, describe in detail the specific embodiments for implementing the invention, and fully disclose the technical content necessary for understanding and implementing the invention, to the extent that a person skilled in the art can implement the invention.

AI algorithms or models possess "black box" characteristics, necessitating sufficient information to achieve the purpose of sufficient disclosure. Depending on the invention's contribution, the technical content necessary for implementing the invention differs. The specification should fully describe the parts that contribute to the prior art. For the technical means embodying the inventive concept of the patent, the specification should clearly and completely describe them, to the extent that a person skilled in the art can implement the invention. The specification should clearly and objectively state the beneficial effects of the application compared to the prior art. When necessary, corresponding evidence can be provided to prove the invention’s contribution.

Here are some suggested practices for the following exemplary circumstances:

For applications where the invention's contribution lies in AI model training, it is generally necessary to clearly record in the specification, based on the problem to be solved or the effect to be achieved by the solution, the algorithms involved in the necessary model training process and their specific steps, as well as the specific process of the training method.

For applications where the invention's contribution lies in AI model construction, it is generally necessary to record in the specification, based on the problem to be solved or the effect to be achieved by the solution, the necessary module structure, hierarchy, or connection relationship, and accurately and objectively describe the functions and effects of the model. When necessary, experimental data, analytical demonstrations, and other methods can be used to show the effects achievable after the improvement.

For applications where the invention's contribution lies in the application of AI in specific fields, it is generally necessary to clearly describe in the specification, based on the problem to be solved or the effect to be achieved by the solution, how the model is combined with specific application scenarios and how input/output data are set. When necessary, the specification should also elucidate the correlation between input data and output data, enabling a person skilled in the art to determine the correlation between them.

In response to examination opinions regarding insufficient disclosure of a specification, when presenting arguments, it is necessary to elaborate on the reasons and basis for why a person skilled in the art is able to implement the relevant solution. It should be noted that the judgment of whether the disclosure of a specification is sufficient is based on the content recorded in the original specification and claims.

4. Judgment on Inventiveness of AI applications

The solutions of AI applications typically include a lot of algorithmic features. In assessing inventiveness, algorithmic features and technical features that functionally support and interact with each other should be considered as a whole. "Functionally supporting and interacting with each other" means that algorithmic features and technical features are tightly integrated, jointly forming a technical means to solve a specific technical problem and achieve corresponding technical effects. After considering the

technical solution as a whole, if the solution exhibits prominent substantive features and notable progress compared to the prior art, the claim is deemed inventive.

Below are exemplary circumstances where algorithmic features, considered as a whole along with technical features, contribute to the technical solution.

Circumstance 1: Making AI algorithm features an integral part of technical means

To make AI algorithm features be considered part of technical means during inventiveness assessment, the claims should demonstrate that the AI algorithm or model, when achieving specific functions or being applied in specific fields, solves a specific technical problem, thereby clarifying the functional support and interaction between algorithmic features and technical features, making algorithmic features an integral part of the technical means.

1.1 The contribution of algorithmic features to the solution when applying AI algorithms or models in specific functions or fields

For applications that utilize AI algorithms or models to achieve specific functions or apply them in specific fields, to ensure that algorithmic features are deemed to make technical contribution to the solution during inventiveness evaluations, the specification should be drafted to specify the technical problems solved, the technical means employed that conform to natural laws and the technical effects achieved in accordance with natural laws when the AI algorithms or models achieve specific functions or are applied in specific fields. Additionally, the essential content for implementing the algorithms or models should also be specified. If the solution involves adjusting existing AI algorithm processes or model parameters, and this adjustment solves technical problems encountered when the AI algorithms or models achieve specific functions or are applied in specific fields, resulting in beneficial technical effects, it can be considered that algorithmic features and technical features functionally support and interact with each other, and thus the contribution of algorithmic features to the solution should be considered during inventiveness evaluations.

For example, existing methods for determining the fall state of humanoid robots during walking mainly rely on posture information or ZMP (Zero Moment Point) position information, but such judgments are incomplete. An application proposes a method for

detecting the fall state of humanoid robots based on multi-sensor detection. By real-time fusion of robotic gait phase information, posture information, and ZMP position information, and utilizing a fuzzy decision-making system, the current stability and controllability of the robot are assessed, providing a reference for the robot's next actions. The solution involves a method for detecting the fall state of humanoid robots based on multi-sensor information, characterized by comprising the following steps: (1) establishing a hierarchical sensor information fusion model by fusing posture sensor information, ZMP sensor information, and robotic walking phase information; (2) using a front-back fuzzy decision-making system and a left-right fuzzy decision-making system respectively to determine the robot's stability in the front-back and left-right directions, with specific steps as follows: ① determining the robotic walking phase based on the contact situation between the robot's supporting foot and the ground and offline gait planning; ② fuzzifying ZMP position information using a fuzzy inference algorithm; ③ fuzzifying the robot's pitch angle or roll angle using a fuzzy inference algorithm; ④ determining an output membership function; ⑤ determining fuzzy inference rules based on steps ① to ④; ⑥ defuzzification. The prior art discloses gait planning for humanoid robots and feedback control based on sensor information, as well as judging robot stability based on relevant fused information, including evaluating the stable state of humanoid robots based on multiple sensor information. That is, the prior art discloses step (1) of the solution. The difference between the solution and the prior art lies in the fuzzy decision-making method employing the specific algorithms in step (2). Based on this application, the solution effectively enhances the robot's stable state and the reliability and accuracy of judging its potential fall direction. Posture information, ZMP position information, and walking phase information serve as input parameters, and the stable state information of humanoid robots is judged through the fuzzy algorithm outputs, providing a basis for further issuing accurate posture adjustment commands. Therefore, the above-mentioned algorithmic features and technical features functionally support and interact with each other. Compared to the prior art, the actual technical problem solved by the invention is determined as: how to judge the robot's stable state and accurately predict its potential fall direction. The implementation algorithm of the above fuzzy decision-making and its application to judging the robot's stable state are not disclosed in other reference

documents and do not belong to common knowledge in the art. The prior art as a whole does not provide inspiration for those skilled in the art to improve the prior art to obtain the claimed invention. The claimed technical solution of the invention is non-obvious compared to the closest prior art and possesses inventiveness.

1.2 Factors to consider when applying AI algorithms or models to different scenarios

If the AI algorithm or model described in an application belongs to prior art, and the improvement to the solution lies in applying it from an existing scenario to the scenario of this application, the assessment of inventiveness should comprehensively consider the proximity of the scenarios where the algorithm or model is applied, whether there is corresponding technical inspiration, the degree of difficulty in applying the algorithm or model to different scenarios, whether there are technical difficulties to overcome, whether unexpected technical effects are brought about, and other aspects.

Furthermore, if the algorithm or model is applied to different scenarios without adjusting elements such as the training method, parameters, or configuration of the algorithm or model by overcoming technical difficulties, and without achieving unexpected technical effects, the solution cannot be deemed inventive.

For example, an application relates to a method for counting the number of ships, which trains a real-time detection data model based on ship image data through deep learning and sums the number of detected ships to solve the technical problem of providing real-time feedback on the number of ships in the current sea area. The closest prior art discloses a method for counting the number of fruits on a tree and also discloses the deep learning model training and the steps of number counting used in the application, and the differences between the closest prior art and the application lie in the different objects of recognition and different application scenarios. Although ships and fruits differ in appearance, volume, environment of existence, etc., for those skilled in the art, the means adopted for both is to perform object recognition and model training on the obtained image information, thereby completing number counting, and when performing image recognition, the position and the boundary of the recognized objects are considered in both the application and the closest prior art. If compared to recognizing and training

fruits in images, recognizing and training ships in images does not change the deep learning and model training processes, or the processing method in image recognition, and the technical effect achieved is simply to make the statistical results more accurate, then the difference in training data only represents a difference in data meaning. The difference in data meaning does not impose constraints, influences, or limitations on the improvement or implementation of the algorithm, and the difference in application scenarios does not impose different constraints, influences, or limitations on the design of the algorithm model. Therefore, applying the fruit counting method of the prior art to ship counting in this solution achieves effects that are predictable based on the prior art, without producing unexpected technical effects, and thus the solution is not inventive.

Circumstance 2: There is a specific technical correlation between AI algorithms/models and internal structures of computer systems

If AI algorithms or models have a specific technical correlation with the internal structures of computer systems, resulting in improved internal performance of the computer systems, the algorithmic features and the technical features in the solution will be considered as a whole during inventiveness evaluations.

Circumstances of improving the internal performance of computer systems include: supporting or optimizing the operation of specific algorithms or models by adjusting the architecture of the hardware system, or optimizing the scheduling of hardware resources in computer systems through the execution of algorithms or models, etc. In such cases, algorithmic features and technical features in the solution will be considered as a whole. If the prior art does not provide relevant technical inspiration, the solution will be deemed inventive.

For example, an application relates to a method for adjusting convolutional neural networks (CNNs) by quantizing neural networks to fixed points to reduce resource usage, enabling CNN models with low-bit fixed-point quantization to run on FPGA platforms with low bit widths and achieving computational accuracy comparable to floating-point networks in low bit widths. The closest prior art discloses a fixed-point training method based on dynamic fixed-point parameters for CNNs, which uses fixed-point forward computation during the training process of CNNs and achieves network accuracy

comparable to floating-point computation within several training cycles. The difference between the solution of this application and the closest prior art is that after a CNN is trained using high-bit fixed-point quantization, the CNN is fine-tuned using the low bit width of the FPGA. Based on this distinguishing feature, this application solves the problem of reduced accuracy due to limited computational resources when using multi-layer CNNs with large data volumes in small FPGA embedded systems, reduces the resource usage for training CNNs on FPGA platforms, and achieves the technical effect of obtaining computational accuracy comparable to floating-point networks on small FPGA embedded systems. Considering the algorithmic features and the technical features such as the low bit width of the FPGA as a whole, there is no relevant technical inspiration in the prior art, and thus this solution is deemed inventive.

Circumstance 3: AI algorithms or models and technical features together constitute technical means to enhance user experience

When AI algorithmic features and technical features in a solution together enhance user experience, during inventiveness evaluations, the algorithmic features and the technical features will be considered as a whole. If the prior art does not provide relevant technical inspiration, then the solution will be considered inventive.

For example, an application relates to a method for implementing online customer service, solving the technical problem in existing e-commerce platforms where users tend to handle complaints and inquiries through human customer service, resulting in ineffective utilization of robot customer service and human customer service resources and high processing pressure on human customer service. The main solution adopted includes: using Long Short-Term Memory (LSTM) networks to analyze the context of user requests, combining with genetic algorithms to optimize the dynamic allocation of human and robot customer services. When detecting excessive load on human customer service, the system uses LSTM networks to predict and automatically direct suitable requests to robot customer service to reduce the processing pressure on human customer service. The closest prior art discloses a method for implementing chat with online customer service, specifically disclosing that users can freely select and switch between three ways to communicate with customer service: robot-only customer service, robot-preferred

customer service, and human-preferred customer service. Among them, in the "human-preferred customer service" mode, when the limit for human reception has been reached or there is a waiting queue, robot customer service communicates with the user. The closest prior art mainly switches between human customer service and robot customer service based on user selection, and the basis for judging whether human customer service is busy is whether the reception limit has been reached or whether there is a waiting queue, which differs from the automatic switching based on AI algorithm weighing in this application. The solution of this application analyzes and automatically switches to robot customer service based on access load through AI algorithms, solving the technical problem of more reasonably allocating user service requests between robot customer service and human customer service, saving user waiting time, and enhancing user experience. Therefore, the solution is deemed inventive.

Guiding Suggestions for Responding to Examination Opinions:

For AI applications involving algorithmic features, when the distinguishing features between the claimed solution and the closest prior art reference also include algorithmic features, if the examiners believe that these algorithmic features do not functionally support or interact with the technical features, they may not consider the contribution of the algorithmic features to the technical solution.

When responding to such examination opinions, the applicants should clarify whether the algorithmic features as distinguishing features enable the solution to solve technical problems, whether these features are closely related to the technical problems the application aims to solve, and whether they functionally support or interact with the technical features. To overcome the defects pointed out in the examination opinion, when making amendments, the applicants may consider incorporating into the claims technical features from the original application that are distinguishable from the closest prior art or algorithmic features that functionally support or interact with the technical features.

For Circumstance 1 above, if the application and the prior art use the same or similar AI algorithms or models, with the main difference lying in functionality or application fields, when responding to an examination opinion of lack of inventiveness, the applicant may emphasize what technical difficulties need to be overcome when the algorithm or model achieves the function of the application or is applied to the field to which the

application belongs, or what unexpected technical effects are achieved.

For Circumstance 2 above, if the main difference between the application and the prior art lies in algorithmic features, when responding to an examination opinion of lack of inventiveness, the applicant may clarify that these algorithmic features have a specific technical correlation with the internal structure of the computer system and can bring about the technical effects of improving the internal performance of the computer system.

For Circumstance 3 above, if the claimed solution can enhance user experience, when responding to an examination opinion of lack of inventiveness, the applicant may explain why the beneficial effect of improving user experience in the application is brought about by technical features or by both technical features and algorithmic features that functionally support or interact with each other.

5. Ethical Issues in AI

For patent applications involving the application of AI algorithms or models in different fields, the applicants should pay attention to whether the application of the claimed solution involving algorithms or models in specific fields violates any relevant laws or social ethics, or harms public interests. For patent applications concerning acquisition and utilization of data using AI, attention should be given to whether all aspects, including data sources, application scenarios, security management, and usage norms, comply with relevant laws. In addition to the data content itself, specific data acquisition, storage, processing, and other relevant means must also meet legal requirements and must not violate social ethics or harm public interests.

In the current era of rapid AI technological development, patent applications have become a crucial means of protecting innovative achievements and promoting technology commercialization. For patent applicants and agents, it is essential to have a deep understanding of the examination points and drafting skills for AI applications. It is hoped that this article can provide valuable references for patent applicants and agents in the practice concerning AI applications, helping them gain an advantage in the fierce market competition and safeguarding the innovation and application of AI technology.

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