Patenting
AI Inventions
Ai发明的专利申请

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Index: Patenting AI Inventions

AI发明的专利申请

1. Satisfying enablement requirements, and
   需满足实施可能要件

2. Adding inventive step when adopting AI.
   当**采用**AI技术时，增加新颖性

3. Suggestions for interviewing AI inventors
   建议和AI发明人面谈

1 and 2 are cited from JPO Examination Guideline with our modifications

上述1和2引自日本专利局的审查指南，我方略作了修改

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Satisfying Enablement Requirements
需满足实施可能要件

Enablement requirements for training AI 指令性AI发明的实施可能要件

Satisfied 满足

It is understood that multiple training data have correlation:
能明白多个指令信息之间有关联

- by general knowledge
  借助于一般性知识
- by explanation or statistic information in the description, or
  借助于描述中的解释说明或者统计信息
- by evaluation of output from learned AI mode
  借助于来自已知AI模式的输出数据的评价

NOT Satisfied 不满足

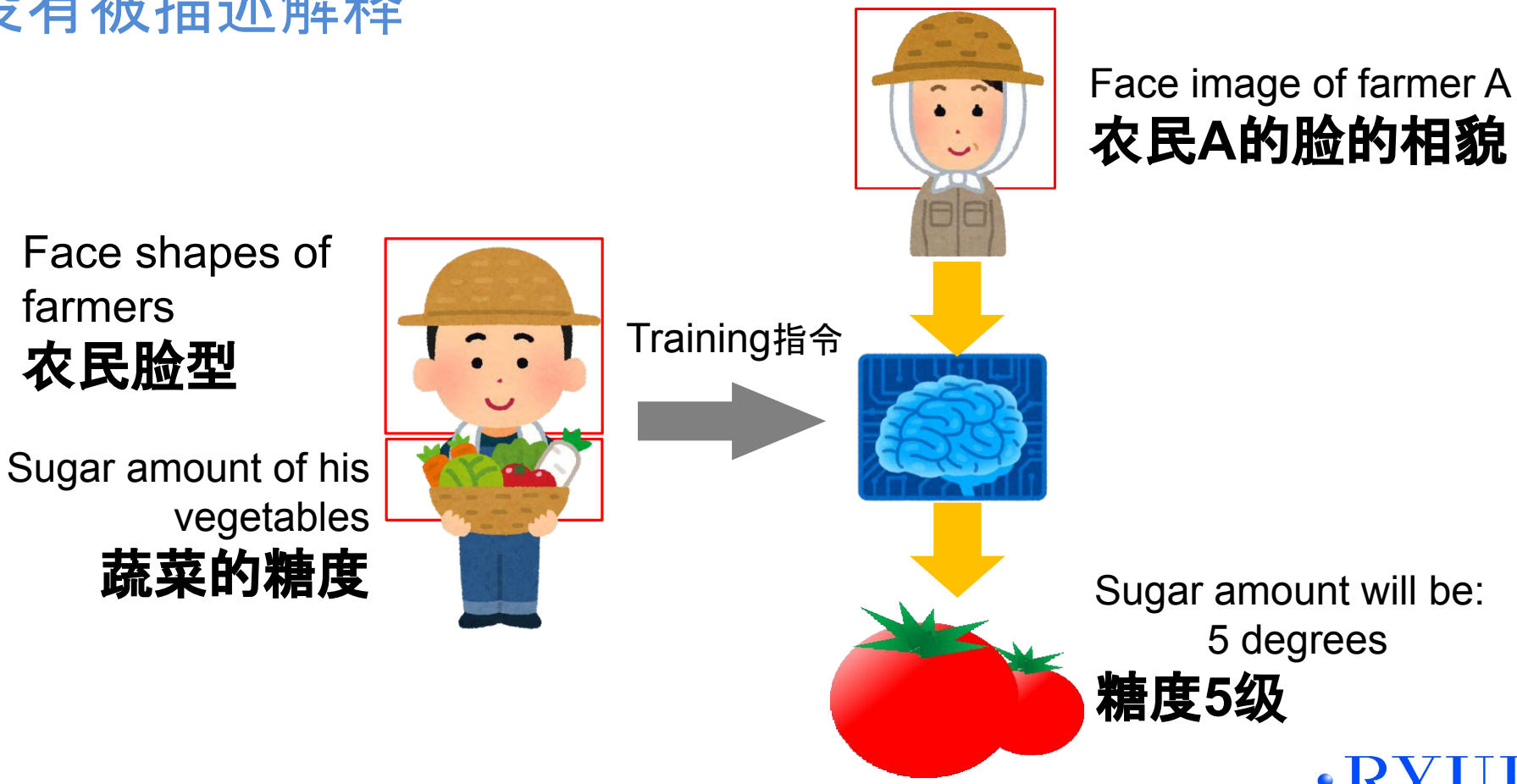
Correlation among training data is not presumed via general knowledge nor explained in the description.
通过一般性知识不能判断指令信息之间有关联性或者在描述中也没有解释说明。

A feature of a claimed product is estimated by AI, but there is no evaluation of the actual product and accuracy of AI estimation is not verified nor understood.
产品的特征是通过AI来评估的，但是该实际产品的评价以及AI估值的准确性是既不能被核实也不能被理解的。

Lack of enablement 缺乏实施可能要件的例子

Correlation among training data is NOT expected via general knowledge NOR supported by description

指令信息之间的相互关联性既不能借助于一般性知识得知也没有被描述解释



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Enablement is Satisfied: where the correlation among training data is presumed from a common knowledge, even if the specification does not disclose the correlation.

满足实施可能要件：即使说明书中没有描述指令信息之间的关联，指令信息之间的关联性可以通过通常的知识来推测出来。

- Product type**产品类型**
- Advertisements **广告**
- Comments**评论**
  - Nice design! **好设计**
  - Easy to break **容易断**
- Past sales quantities
  过去的销售数量

Training指令

- Type of a new product 新产品类型
- Advertisements广告
- Comments评论

Future sales 500
未来的销售额 500

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Claim Example 权利要求的实例引自新修改的日本专利审查指南

…cited from the JPO exam guideline with modification

A business plan design apparatus comprising:

a reception means for receiving a product type, web advertisements and comments;

a simulation means for simulating sales quantity of the product based on the product type, web advertisements and comments, using an estimation model that has been trained through machine learning with training data containing product types, web advertisements and comments of products and past sales quantities of the products; and

an output means for outputting the sales quantity.

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Enablement is satisfied: 满足实施可能的要件

even if training data is **labeled by human**, provided that the correlation is understood via general knowledge.

即使指令信息由人做出，如果(指令信息之间的)相互之间的关联性通过一般性知识可以被理解，也可以

Images of drivers

司机的样子

驶

Evaluation by Human

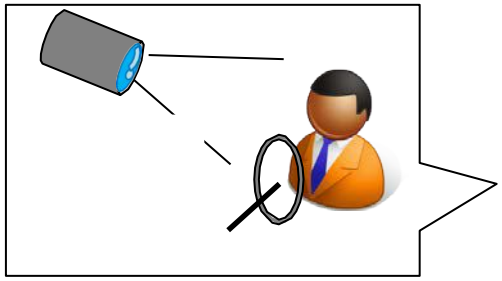
人的评价

Manual手动driving驾驶: NG

Manual手动driving驾驶: OK

Training

指令



Autonomous driving

自动驾

Image of driver司机的样子

Manual driving ok

手动驾驶可以吗?

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Claim Example …. cited from the Exam Guideline with modification
权利要求的实例….引自新修改的日本专利审查指南

An autonomous driving system comprising:

an image capturing unit that is positioned to capture an image of a driver; and

a quick reaction capability estimation unit that inputs the image to a trained learning model and obtains a quick reaction capability of the driver from a trained learning model, the trained learning model having been trained through machine leaning to estimate a quick reaction capability of the driver,

wherein switching from an autonomous driving to a manual driving is prohibited, in case the quick reaction capability is below a predetermined value.

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Claim 2: Enable, because correlation among training data is supported in the spec. by data, but**实施可能，因为在专利申请书中有数据表明了指令性信息之间的关联，但是**

Claim 1: Not enabled, because the correlation is not supported by the spec. nor presumed.

实施不可能，因为在专利申请书中既没有表明也无法推测出（指令性信息之间的）关联

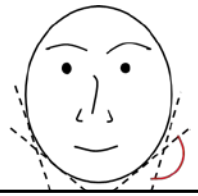
权利要求1

- body height**身高**
- face shape **脸型**
- body weight**体重**

权利要求2

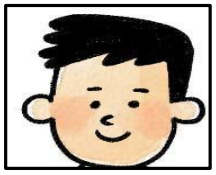
Said face shape is face-outline angle

侧脸形状是脸轮廓的角度



Training**指令**

- body height**身高**
- face image **脸的样子**



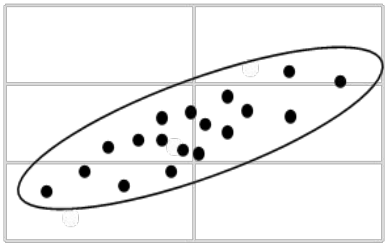
body weight

体重

69.6kg

Specification 详细说明

Face-outline angle **脸轮廓角度**



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Claim Example …. cited from the Exam Guideline with modification

权利要求的实例･･･引自新修改的日本专利审查指南

1. A body weight estimation system comprising:

a model generation means for generating a model that estimates a body weight of a person based on a feature value of a face shape and a height of the person, through machine learning using training data containing feature values of face images and heights and weights of people;

a reception means for receiving a face image and height of a person;

a feature obtainment means for obtaining a feature value of a face shape by analyzing the face image; and

a processing means for outputting an estimated body weight of the person based on the feature value and the height of the person, using the model.

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Claim Example …cited from the JPO exam guideline

权利要求的实例･･･引自日本专利审查指南

2. The body weight estimation system as claimed in Claim 1, wherein the feature value representing the face shape is a face-outline angle.

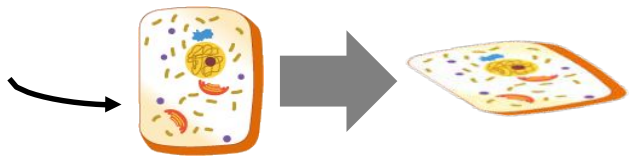
Enablement is satisfied, if a correlation among training data is verified by examination results of AI output.

如果指令性数据之间的关联是可以被AI的输出数据的审查结果所确认核实的话，那么符合实施可能要件

Claim 1 权利要求1 (**Not Enable**) （不可能实施）

Known substance

已知物质



Incidence rate of allergic reaction

过敏反应的发病率

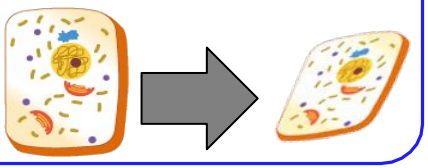
Claim 2 权利要求2 (**Enabled**) **（可能实施）**

Said allergic reaction is contact dermatitis

上述过敏性反应是接触性皮炎

Test substance

测试物质



Training 指令

Expected incidence rate of allergic reaction

过敏反应的预测发病率

Specification discloses examination results that verify the expected contact-dermatitis rate by the test substance

专利说明书揭示了**审查结果**，该审查结果通过测试物质确认核实了预期的接触性皮炎发病率

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Non-Enable Claim Example …cited from the JPO exam guideline

非实施可能的权利要求的实例…引自日本的专利审查指南

1. A method for estimating an allergy incidence rate of a test substance comprising:

inputting a training data to an artificial intelligence model, the training data including a group of data representing a shape change of a human X cell in culture solution and a scoring data on incidence rates of human allergic reaction caused by each substance, in which each substance is separately added to the culture solution and the incidence rate of allergic reaction caused by each substance is known;

obtaining a group of data representing a shape change of a human X cell that has been measured in culture solution to which a test substance is added;

inputting, to the trained artificial intelligence model, the group of data obtained by said obtaining; and

causing the trained artificial intelligence model to calculate a scoring data of an incidence rate of human allergic reaction.

Enabled Claim Example

…cited from the JPO exam guideline with modifications

实施可能的权利要求的实例…引自日本专利局的新修改的专利审查指南

2. The method for estimating an allergy incidence rate as claimed in Claim 1,

wherein the allergic reaction is contact dermatitis.

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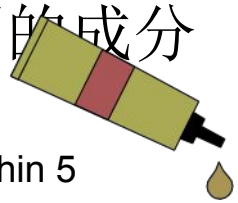
A product estimated by AI is not enabled, unless the actual product or estimation accuracy is verified.

用AI来估计产品被认为是实施不可能的，除非该实际产品或者估计的准确度是可以被确认核实的。

Composition of anaerobic adhesive
厌氧粘合剂的成分



Curing strength within 5 minutes of curing
五分钟内固化强度

Curing strength after 24 hours
24小时后的固化强度

Training指令

Q

Anaerobic adhesive with a curing strength equal to 30 %?
厌氧粘合剂的固化强度等于30%?

A

Anaerobic adhesive comprising: compound A ○ % compound B △%
厌氧粘合剂包括：
化合物 A ○ %
化合物 B △ %

No disclosure of actual production or measurement of the curing strength.
没有揭示实际产品或固化强度的测量结果

Not Patentable无法授予专利

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Satisfying Enablement Requirements

满足实施可能要件的要求

by explaining that multiple training data have correlation via:

解释多项指令性信息之间是有关联的，通过:

- explanation based on general knowledge
- **基于一般性知识进行解释**
- statistics among training data, or
- **基于指令性信息之间的统计数据，或**
- evaluation results of output from learned AI model
- **从已知的AI模式输出数据的评估结果**

Adding Inventive Step

增加创造性

NOT Inventive

不具有创造性

Merely converting human operations, or other known methods to AI

仅仅是将人类的操作或者其他已知方法转换成AI

Adding known relevant data for training, which provides only known effects

增加的是仅仅提供已知效果的已知相关指令信息

Inventive

具有创造性

Adding new training data, or

增加新的指令信息，或

preprocessing training data,

预处理指令信息

which provides significant effects

且该预处理指令信息提供了明显效果

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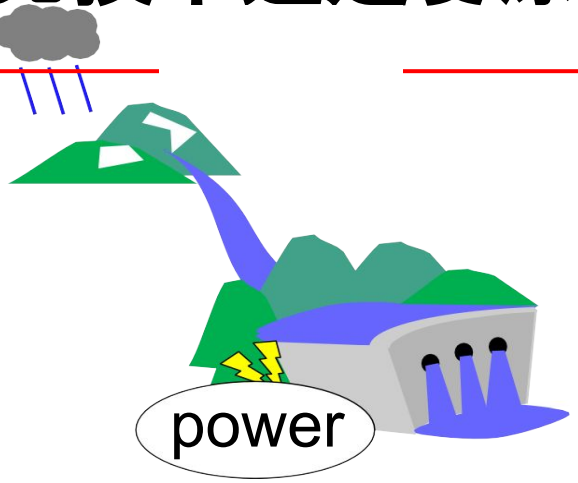
Not Inventive: Mere conversion to AI
不具有新颖性：仅仅是转换成AI

Prior art estimates power generating capacity by regression.

在先技术通过复原估测发电量



- Past water inflow into a dam**过去的流入大坝的水流**
- Water flow of the river upper stream**上游的河水流量**
- Precipitation around the upper stream**上游的降水量**

Later power generation capacity in the past**过去的发电量**

Training指令

Past water inflow into a dam**过去的流入大坝的水流**

Water flow of the river upper stream**上游的河水流量**

Precipitation around the upper stream**上游的降水量**

Expected power generation capacity**预期的发电量**

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Claim Example …. cited from the Exam Guideline with modification

实施可能的权利要求的实例…引自日本专利局的新修改的专利审查指南

1. An estimation system of a power generating capacity comprising:

a neural network in which input contains a precipitation amount of a river upper stream, a water flow of the upper stream, and a water inflow into a dam during a period between a reference time and a predetermined time before the reference time, and output contains a power generating capacity after the reference time;

a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and the output; and

an estimation unit that inputs data to the neural network being trained by the machine learning unit by setting current time as the reference time, and calculates power generating capacity.

Inventive: where a new type of input provides significant technical effects

创造性：新的输入提供了显著的技术效果

2. The estimation system of a power generating capacity as in Claim 1, wherein the input further contains temperature of upper area during the predetermined period.

2.权利要求1中的发电量估测系统，进一步要求包含了预定期间的**上游区域的温度**的输入

…. cited from the Exam Guideline with modification

引自修改后的专利审查指南

This makes estimation accurate, taking increase of inflow rate due to meltwater in spring into consideration.No prior art considered the past temperature.

通过考虑到春天融化的水流量的增加，而使得估测更准确。在先技术没有考虑到过去的温度。

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Not Inventive: Mere combination of known AI (green)and known relevant parameter (red)

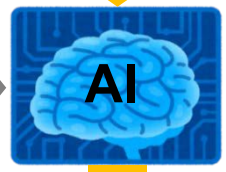
不具有创造性：仅仅是已知AI技术(绿色)和已知相关参数（红色）的结合

Screw driver 螺丝刀
- rotation speed旋转速度
- angular acceleration角加速度
- position位置
- inclination倾斜度

Actual screw 实际的螺丝钉

clamping quality 固定质量

Training



Screw driver 螺丝刀
- rotation speed旋转速度
- angular acceleration角加速度
- position位置
- inclination倾斜度

Actual screw 实际的螺丝钉

clamping quality 固定质量

[Prior Art] 在先技术

Screw driver 螺丝刀
- position位置
- inclination倾斜度

Screw clamping quality

螺丝钉固定质量

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Prior AI 在先的AI技术

Voice recognition
声音识别

"What did you eat for today's breakfast? I ate an egg."
今天的早餐你吃的什么？我吃的鸡蛋

"How is the weather today? It's a sunny day.
今天天气怎么样？是晴天

What did you eat yesterday? I ate hamburger."
你昨天吃的什么？吃的汉堡包

Actual dementia stage
事实上的痴呆阶段

Training 指令

Expected dementia stage 预测的痴呆阶段

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Inventive: where pre-processing of training data provides significant effects

具有创造性：指令性信息的预处理程序提供了显著的效果

Specifying questioner voice & patient voice

明确发问者&患者声音

What did you eat yesterday?

你昨天吃的什么？

I ate an egg. 我吃的鸡蛋

Specifying question topic

明确问题的内容

Question topic: Food 问题内容：食物

Patient: I ate an egg. 患者： 我吃的鸡蛋

For training **用于指令**

In use 使用中

Question topic: Weather 问题内容： 天气

Patient : It's a sunny day. 患者： 是晴天

Question topic: Food 问题内容： 食物…

Patient : I ate hamburger. 患者： 我吃的汉堡包

Actual dementia stage 事实上的痴呆阶段

Expected dementia stage 预测的痴呆阶段

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Claim Example …. cited from the Exam Guideline with modification

权利要求的实例…. 引自新修改的日本专利审查指南

A dementia stage estimation apparatus comprising:

a voice analyzer for specifying voices of a questioner and patient;

a voice recognition means for converting the voices of questioner and patient into question text and patient text, respectively;

a question topic specifying means for specifying a question topic based on the question text; and

a dementia stage determination means for inputting the question topic and the patient text to a trained neural network and determining a dementia stage of the patient,

wherein the neural network is trained through machine learning using training data so as to output an estimated dementia stage in response to a question topic and patient text.

Our Suggestions

我方建议

Interviewing inventors aiming for enablement and inventive step

和发明人进行面对面会谈旨在确认实施可能性和发明创造性

Suggestion 1 for interviewing AI inventors Seeking for **preprocess** of training data
建议1 与AI发明的发明人进行会谈以便能找到指令信息的**预处理程序**

Ex.) Sound of engine for detecting malfunction例如：检测故障的引擎声音

Adjusting volume?调整音量？

Filtering specific sonic band? 过滤具体声音带？

Cutting noise?减少噪音？

Ex.) Image of airport for landing navigation例如：机场的降落导航的图像

Adjusting brightness?调正亮度？

Filtering out cloud?过滤云层？

Offsetting vibration?抵消振动？

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Suggestion 2: Claiming with new input

If a new (combination of) input provides inventive step, it might be patentable even as non-AI.

建议2: 权利要求主张新的输入

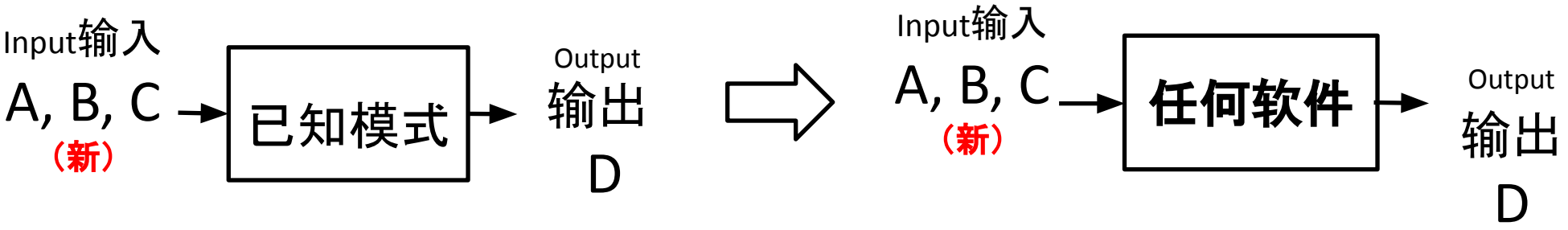
如果一个新的输入(的结合)提供了创造性，和非AI发明一样，有可能被授予专利。

Proposed invention

推荐的发明

Might also be inventive

可能有创造性



- Asking the inventor for reasons and test data explaining the effects of new input, and writing them in the specification.

询问发明人理由和有关新输入的效果的测试数据，并且写进专利说明书。

- Any other comparable parameters? 任何其他可比较的参数？

Claiming with a word that covers comparable parameters.

权利要求包含有可比较参数的单词

Suggestion 3 for interviewing AI inventors

关于与AI技术发明人面谈的建议3

Inventors often use open source libraries of AI.

发明人通常使用AI的公共资源的图书馆

Asking specific parameters given to the AI libraries

向该AI图书馆询问具体的参数

- for finding any new parameters -以便寻找任何**新的参数**

Asking how each parameter is prepared询问每个参数是如何被准备的

- for finding any pre-process-以便找到任何**预先程序**

Asking possible further improvements of input and pre-process

询问输入和预先程序进一步可能的改善

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Suggestion 4: Avoiding divided infringement of learning machine and machine in use

避免学习机器以及使用中的机器的分案侵权

- Leaning machine could be on cloud.

学习机器可能在(计算机)的云计算

- Ideal to claim each machine separately

最理想的是分别地权利要求每个机器

ex. Slides 6 (Sales) and 8 (Autonomous Driving)

例:幻灯片6(销售)和幻灯片8(自动驾驶)

- The combination should also be considered.也可以考虑他们的结合

ex. Slide 10 (Body Weight) 例:幻灯片10(身体体重)

- Both machines should be described in the specification for satisfying enablement requirements.
- 两个机器应该都在专利申请书中加以说明以便满足实施可能的要求

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Suggestion 5: Claiming interfaces for easily proving infringements

建议5：为了容易证明侵权，将联接装置也进行权利要求

∵ It is difficult to prove internal processes & no discoveries in Japan

很难证明内部程序&在日本没有发现

Input Input parameters 输入参数

输入 How to provide training and actual input (ex. sensors)

如何提供指令和实际输入(例如：感应器)

How to label training data (ex. positive/negative)

如何标注指令性数据(例：肯定/否定)

Output Output parameters输出参数

输出 How to use output (ex. controlling something)

如何使用输出(例：控制某个东西)

Control 控制 Control of training process指令性程序的控制

ex. alarming failed judgements (ex. downhill curve)

例：警示失败的判断（例：下滑曲线）

Control of use process 使用程序的控制

ex. notifying of difficult circumstance for own judgements

例：通知困难情况以便自己进行判断

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感言

关于我们:

2018年迎来建所二十周年,
现有39个代理人，总员工数120人

所获荣誉:

日本排名前二十的专利事务所Managing IP
日本排名前二十的专利事务所Managing IP
日本排名前五的专利事务所Asia IP Awards
日本排名前十的专利事务所Asia IP Patent Survey
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我们致力于和客户的积极沟通，旨在深入了解客户的想法和创新过程。