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㉤④ **A method, system, device, and storage medium for monitoring the growth conditions of tea plant.**

�⑺ This invention discloses a method, system, device, and storage medium for monitoring the growth conditions of tea plants, related to the field of tea plant growth monitoring technology. The method includes: Collecting monitoring data for tea plants; the monitoring data for tea plants includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data; preprocessing the tea plant monitoring data to obtain a monitoring database; inputting the data from the monitoring database into a tea fresh leaf yield image estimation model to predict tea plant yield; the tea fresh leaf yield image estimation model is constructed based on a network model for identifying tea leaf buds and a regression model; the tea leaf bud identification network model is constructed using deep learning networks; based on the tea plant yield and the monitoring database, automatically fertilizing the tea plants.
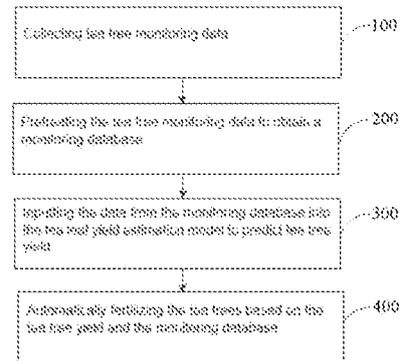
Fig.1

DESCRIPTION

A METHOD, SYSTEM, DEVICE, AND STORAGE MEDIUM FOR MONITORING THE GROWTH CONDITIONS OF TEA PLANT

TECHNICAL FIELD

This invention pertains to the field of tea plant growth monitoring technology, specifically focusing on a method, system, device, and storage medium for monitoring the growth conditions of tea plants.

BACKGROUND

The traditional tea garden management relies primarily on manual labor. Estimating tea production, determining the picking period, and monitoring the growth of tea plants still largely depend on accumulated experience. This approach is time-consuming, labor-intensive, and lacks precision, making it unable to provide accurate monitoring of the tea plant's growth status.

SUMMARY

The purpose of this invention is to provide a method, system, equipment, and storage medium for monitoring the growth status of tea plants, with the aim of improving the accuracy of monitoring their growth condition.

To achieve the above objective, this invention offers the following solutions:

A method for monitoring the growth conditions of tea plants, comprising:

Collecting monitoring data for tea plants. The monitoring data for tea plants includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data;

Preprocessing the tea plant monitoring data to obtain a monitoring database;

Inputting the data from the monitoring database into a tea fresh leaf yield image LU505298 estimation model to predict tea plant yield. The tea fresh leaf yield image estimation model is constructed based on a network model for identifying tea leaf buds and a regression model;

The tea leaf bud identification network model is constructed using deep learning networks;

Automatically fertilizing the tea plants based on the tea plant yield and the monitoring database.

Optionally, preprocess the tea plant monitoring data and obtain a monitoring database, it includes the following steps: Removing duplicates, formatting, and filling in missing values in the tea plant monitoring data to obtain complete data; Converting the complete data into a suitable data format to obtain valid data; Using an ETL tool to transform the valid data into a structured format, resulting in a collection database; performing data integration and establishing data relationships within the collection database to obtain the monitoring database.

Optionally, the training process of the tea leaf bud target recognition network model is as follows: Obtain training data; the training data includes tea leaf bud images along with their corresponding bud counts; build a YOLOv3 deep learning network model; input the training data into the YOLOv3 deep learning network model and train it based on the loss function; the trained YOLOv3 deep learning network model is then designated as the tea leaf bud target recognition network model.

Optionally, the tea fresh leaf yield image estimation model is represented as follows:

$$YF = NF \times SLW/100$$

$$Yg = YF \times Ag \times C/AF$$

In the formula for the tea fresh leaf yield image estimation model: Y_F represents the predicted tea plant yield within the video image. N_F represents the number of tea leaf buds in the video image. SLW represents the weight of one hundred tea leaf buds (typically expressed as "per one hundred buds"). Y_g represents the estimated yield of tea leaf buds on the tea plant. A_g represents the area of the tea plant cultivation. C represents the tea plant coverage percentage. A_F represents the area of the captured image.

Optionally, automatically fertilize tea plants based on the tea plant yield and the

monitoring database, it includes the following steps: generate fertilization control commands based on the tea plant yield and a fertilization decision algorithm; determine the fertilization plan by correlating the fertilization control commands with associated data from the monitoring database; implement the established fertilization plan by controlling integrated water and fertilizer equipment to automatically apply fertilizers to the tea plants.

Optionally, data collection module; which is used for collecting monitoring data for tea plants. The tea plant monitoring data includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data; preprocessing module: which is used for preprocessing the tea plant monitoring data to obtain a monitoring database. Yield estimation module which is used to input the data from the monitoring database into a tea fresh leaf yield image estimation model to predict tea plant yield. The tea fresh leaf yield image estimation model is constructed based on a network model for identifying tea leaf buds and a regression model. The tea leaf bud identification network model is constructed using deep learning networks. Automatic fertilization based on the tea plant yield and the monitoring database.

According to the described tea tree yield and the set fertilization plan, automatic fertilization is applied to the tea trees.

This invention also provides an electronic device comprising memory and a processor, where the memory is used to store a computer program, and the processor executes the computer program to enable the electronic device to perform the monitoring method for the tea tree growth conditions as described above.

Furthermore, this invention provides a computer-readable storage medium that stores a computer program, which, when executed by a processor, implements the monitoring method for the tea tree growth conditions as described above.

According to specific embodiments provided by this invention, the following technical advantages are disclosed:

This invention discloses a method, system, device, and storage medium for monitoring the growth conditions of tea trees. The method includes collecting tea tree monitoring data, which comprises video images of tea tree growth, spectral data, soil moisture content, and meteorological environmental data. The monitoring data is preprocessed to obtain a

monitoring database. The data from the monitoring database is input into a tea fresh leaf yield LU505298

image estimation model to predict tea tree yield. The tea fresh leaf yield image estimation

model is constructed based on a target identification neural network model and a regression

model for tea leaf buds. The tea leaf bud target identification neural network model is built

using deep learning networks. Based on the tea tree yield and the monitoring database,

automatic fertilization is applied to the tea trees. This invention can improve the accuracy of

monitoring the growth conditions of tea trees.

BRIEF DESCRIPTION OF THE FIGURES

In order to explain the embodiments of the present invention or the technical scheme in

the prior art more clearly, the drawings needed in the embodiments will be briefly introduced

below. Obviously, the drawings in the following description are only some embodiments of

the present invention. For ordinary people in the field, other drawings can be obtained

according to these drawings without paying creative labor. Brief description of the drawings

Fig. 1 is a schematic flow chart of the monitoring method of tea tree growth condition of

the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In the following, the technical scheme in the embodiment of the invention will be clearly

and completely described with reference to the attached drawings. Obviously, the described

embodiment is only a part of the embodiment of the invention, but not the whole embodiment.

Based on the embodiments in the present invention, all other embodiments obtained by

ordinary technicians in the field without creative labor belong to the scope of protection of the

present invention.

The purpose of this invention is to provide a method, system, device, and storage

medium for monitoring the growth status of tea plants, aiming to improve the accuracy of

monitoring the growth conditions of tea plants.

To make the objectives, features, and advantages of this invention more apparent and

understandable, the following detailed description is provided in conjunction with the

drawings and specific embodiments.

As shown in Figure 1, this invention provides a method for monitoring the growth status

of tea plants, comprising the following steps:

Step 100: Collect tea plant monitoring data. The tea plant monitoring data includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data.

Step 200: Preprocess the tea plant monitoring data to obtain a monitoring database.

Step 300: Input the data from the monitoring database into a tea fresh leaf yield image estimation model to predict the tea plant yield. The tea fresh leaf yield image estimation model is constructed based on a tea leaf bud target identification neural network model and a regression model. The tea leaf bud target identification neural network model is built using deep learning networks.

Step 400: Based on the tea plant yield and the monitoring database, automatically fertilize the tea plants.

As a specific embodiment of Step 200, it includes:

Removing duplicates, formatting, and filling missing values in the tea plant monitoring data to obtain complete data.

Performing data format conversion on the complete data to obtain valid data.

Using an ETL (Extract, Transform, Load) tool to perform collection format conversion on the valid data to obtain a collection database.

Integrating and relating data in the collection database to obtain the monitoring database.

The training process of the tea leaf bud target identification neural network model is as follows:

Obtain training data, which includes tea leaf bud images and the corresponding number of leaf buds.

Construct a YOLOv3 deep learning network model.

Input the training data into the YOLOv3 deep learning network model and train it based on the loss function. The trained YOLOv3 deep learning network model is then designated as the tea leaf bud target identification neural network model.

The image yield estimation model of fresh tea leaf yield is expressed as:

$Y_F = N_F \times SLW/100$

$Y_g = Y_F \times A_g \times C/A_F$

wherein: Y_F represents the predicted tea plant yield within the video image. N_F represents

the number of tea leaf buds in the video image. SLW represents the weight of one hundred tea leaf buds . Y_g represents the estimated yield of tea leaf buds on the tea plant. Ag represents the area of the tea plant cultivation. C represents the tea plant coverage percentage. AF represents the area of the captured image.

As a specific implementation of step 400, it includes the following:

Outputting fertilization control commands based on the tea tree yield and fertilization decision algorithm.Determining a set fertilization plan based on the fertilization control commands and associated data from the monitoring database.

Controlling the water and fertilizer integration equipment to automatically fertilize the tea trees according to the set fertilization plan.

Based on the above technical solution, the following implementation example is provided:

To implement the above plan, follow these steps:

In the first step, use a tea tree growth monitoring device to intelligently collect atmospheric, soil environment, soil nutrient, and tea tree growth image data in the tea plantation.

In the second step, clean, parse, and transform the raw data collected by the equipment, outputting it in a database-standard storage format and meeting system requirements, and construct a database.

In this implementation example, various data processing tools and script writing techniques are used. Data cleaning involves scripting to remove duplicates, format data, fill missing values, etc., ensuring data accuracy and completeness. Data parsing is done using scripts to transform data into an actionable format, such as converting JSON data into CSV or XML format for later data analysis. Data transformation involves using ETL (Extract, Transform, Load) tools to convert data formats or govern data, such as converting data from MySQL to MongoDB databases. Data integration uses scripts to combine data from multiple sources, such as integrating image data, spectral data, soil moisture data, environmental monitoring data from various smart sensors. Data analysis involves scripting to perform statistical analysis, modeling, and other operations to match correlated data related to tea tree growth, ultimately deriving conclusions about the tea tree's growth status.

The third step involves preprocessing the data using deep learning technology, monitoring sensor status, and optimizing the data collection frequency.

In this implementation example, deep learning technology utilizes a neural network structure comprising multiple layers of neurons. Each layer weights and processes input signals before passing them to the next layer for further processing. Deep learning technology trains the network using a large amount of data and backpropagation algorithms, enabling the network to gradually learn abstract features and automatically extract useful features. This allows it to efficiently perform tasks such as image recognition.

The fourth step involves real-time prediction of tea leaf yield, diagnosis of tea leaf quality, and soil nutrient assessment using embedded models: the tea leaf yield estimation model, tea leaf quality analysis model, and soil nutrient diagnostic model.

In this implementation example, the tea leaf yield estimation model calculates tea leaf yield by identifying tea leaf buds (one bud and one leaf), bud weight, yield coefficient, sample area, and coverage.

1. Utilizing deep learning technology to construct a tea leaf bud target recognition neural network model.

2. Employing an untrained test dataset for bud recognition.

3. Evaluating the model using accuracy and recall, with specific evaluation formulas as follows:

$P = TP/(TP+FP)$

$R = TP/(TP+FN)$

$F1 = (2P×R)/(P+R)$

wherein,

P —— accuracy of bud identification; TP —— Correctly identify the number of all kinds of tea buds; FP —— Misidentifying the number of all kinds of tea buds; FN —— The number of all kinds of buds is not recognized; R-recall rate; F1 —— Harmonic average of accuracy and recall.

4) The accuracy of model evaluation should be greater than 85%, and the recall rate should be 0~1.

5) Estimating soil nutrient content based on the relationship between soil electrical conductivity and soil nutrients. Soil electrical conductivity can reflect the concentration of dissolved salts and ions in the soil, and these dissolved salts and ions are often correlated with soil nutrient content.

6) The specific model for calculating soil nutrient content using electrical conductivity can vary depending on the actual circumstances. In this implementation example, both simple linear regression models and multiple linear regression models are used:

Simple linear regression model: nutrient content = a× conductivity+b；; Among them, a and b are regression coefficients, which need to be trained and determined according to actual data. Multiple linear regression model: nutrient content = b0+b1× conductivity 1+b2× conductivity 2+...; Among them, b0, b1, b2, ... are regression coefficients, and conductivity 1, conductivity 2, ... are selected conductivity parameters related to nutrient content.

7) Calculate and estimate the yield of fresh tea leaves by the number of buds and the weight of 100 buds obtained by the automatic bud identification model, and the formula is as follows:

$$Y_F = N_F \times SLW/100$$

$$Y_g = Y_F \times A_g \times C/A_F$$

Wherein, Y_F is the predicted tea yield in the video image; N_F is the number of buds in the video image; SLW is 100 bud weight; Y_g estimates the yield of tea buds; A_g is the planting area of tea trees; C is the coverage of tea trees; A_F is the area of the captured image.

Step 5, based on the diagnostic results mentioned above, establish a precise management plan for tea picking and tea plantation fertilization. Part of this plan will be implemented in real-time through a mobile application (app) for manual intervention, while another part will be automated through the control system for automatic fertilization in the tea plantation.

An embodiment of automatic fertilization control is as follows:

1. Various sensors installed in the tea plantation, such as light sensors, temperature and humidity sensors, soil moisture sensors, high-definition cameras, etc., collect real-time data on tea tree growth, environmental climate in the tea plantation, soil temperature and humidity, soil pH, and soil nitrogen, phosphorus, and potassium content. This data is transmitted to the central control system through a wireless network.

2. After receiving the data collected by the sensors, the central control system uses advanced data processing and analysis algorithms, such as regression models, for real-time analysis of tea tree growth, tea plantation climate, and soil nutrients. For example, it analyzes tea leaf color, leaf surface temperature, and morphology using image recognition algorithms and monitors and evaluates tea plantation climate and soil nutrients online using data mining algorithms.

3. Based on the results of data analysis, the central control system, following predefined fertilization rules and the needs of the tea trees, triggers the fertilization system automatically under appropriate conditions. The fertilization decision algorithm takes into account factors such as the tea tree's growth status, tea plantation climate, and soil nutrients to determine the appropriate fertilization plan and dosage.

4. The automatic fertilization system consists of water and fertilizer integration equipment and a control device. Based on the results of the fertilization decision algorithm, the control device sends commands to the water and fertilizer integration equipment to carry out precise fertilization operations. The water and fertilizer integration equipment adjusts the water-fertilizer ratio and fertilization timing as needed to ensure that the tea trees receive an appropriate supply of water and nutrients.

This embodiment has the following beneficial effects:

This embodiment provides an intelligent monitoring and diagnostic method for the growth status of tea trees through video, spectrometry, soil moisture, and meteorological data. This method can monitor the growth of tea trees in the tea plantation in real-time, promptly detect changes in the condition of the tea trees, prevent and resolve issues that may arise during the growth process, improve tea tree yield and quality, and provide accurate data support for tea production.

Additionally, the invention also provides a monitoring system for the growth status of tea trees, including:

A data collection module for gathering tea tree monitoring data, which includes video images of tea tree growth, spectral data, soil moisture, and meteorological environmental data.

A preprocessing module for preprocessing the tea tree monitoring data to obtain a monitoring database.

A yield estimation module that inputs data from the monitoring database into the tea leaf LU505298 yield estimation model to predict tea tree yield. The tea leaf yield estimation model is constructed based on a tea leaf bud target recognition neural network model and a regression model. The tea leaf bud target recognition neural network model is constructed using deep learning networks.

Automatic fertilization of tea trees based on the tea tree yield and the set fertilization plan.

The invention also provides an electronic device, including memory and a processor. The memory stores a computer program, and the processor executes the computer program to perform the monitoring method for the growth status of tea trees as described above.

The invention also provides a computer-readable storage medium that stores a computer program. When executed by a processor, the computer program implements the monitoring method for the growth status of tea trees as described above.

The various embodiments in this specification are described progressively, with each embodiment highlighting the differences from other embodiments. Similar or identical parts between the various embodiments can be referenced accordingly.

Specific examples have been used in this document to elucidate the principles and implementation of the invention. The descriptions of the above embodiments are provided to facilitate an understanding of the core concepts of the invention. At the same time, for those skilled in the art, changes may occur in the specific implementation methods and application scope based on the principles of the invention. In summary, the content of this specification should not be construed as limiting the invention.

CLAIMS

1. A method for monitoring the growth conditions of tea plants, comprising:

collecting monitoring data for tea plants; the monitoring data for tea plants includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data;

preprocessing the tea plant monitoring data to obtain a monitoring database;

inputting the data from the monitoring database into a tea fresh leaf yield image estimation model to predict tea plant yield; the tea fresh leaf yield image estimation model is constructed based on a network model for identifying tea leaf buds and a regression model;

the tea leaf bud identification network model is constructed using deep learning networks;

automatically fertilizing the tea plants based on the tea plant yield and the monitoring database.

2. The method for monitoring the growth conditions of tea plants, as claimed in claim 1, preprocess the tea plant monitoring data and obtain a monitoring database, it includes the following steps: removing duplicates, formatting, and filling in missing values in the tea plant monitoring data to obtain complete data; converting the complete data into a suitable data format to obtain valid data; using an ETL tool to transform the valid data into a structured format, resulting in a collection database; performing data integration and establishing data relationships within the collection database to obtain the monitoring database.

3. The method for monitoring the growth conditions of tea plants, as claimed in claim 1, the training process of the tea leaf bud target recognition network model is as follows: obtain training data; the training data includes tea leaf bud images along with their corresponding bud counts; build a YOLOv3 deep learning network model; input the training data into the YOLOv3 deep learning network model and train it based on the loss function; the trained YOLOv3 deep learning network model is then designated as the tea leaf bud target recognition network model.

4. The method for monitoring the growth conditions of tea plants, as claimed in claim 1, the tea fresh leaf yield image estimation model is represented as follows:

$$YF = NF \times SLW / 100$$

$$Yg = YF \times Ag \times C / AF$$

in the formula for the tea fresh leaf yield image estimation model: Y_F represents the predicted tea plant yield within the video image; N_F represents the number of tea leaf buds in the video image; SLW represents the weight of one hundred tea leaf buds; Y_g represents the estimated yield of tea leaf buds on the tea plant; A_g represents the area of the tea plant cultivation; C represents the tea plant coverage percentage; A_F represents the area of the captured image.

5. The method for monitoring the growth conditions of tea plants, as claimed in claim 1, automatically fertilize tea plants based on the tea plant yield and the monitoring database, it includes the following steps: generate fertilization control commands based on the tea plant yield and a fertilization decision algorithm; determine the fertilization plan by correlating the fertilization control commands with associated data from the monitoring database; implement the established fertilization plan by controlling integrated water and fertilizer equipment to automatically apply fertilizers to the tea plants.

6. A monitoring system for the growth conditions of tea plants, characterized by: data collection module; which is used for collecting monitoring data for tea plants; the tea plant monitoring data includes video images of tea plant growth, spectral data, soil moisture content, and meteorological environmental data; preprocessing module: which is used for preprocessing the tea plant monitoring data to obtain a monitoring database; yield estimation module, which is used to input the data from the monitoring database into a tea fresh leaf yield image estimation model to predict tea plant yield; the tea fresh leaf yield image estimation model is constructed based on a network model for identifying tea leaf buds and a regression model; the tea leaf bud identification network model is constructed using deep learning networks; automatic fertilization based on the tea plant yield and the monitoring database.

7. An electronic device, characterized by including a storage unit and a processor, wherein the storage unit is used for storing a computer program, and the processor executes the computer program to enable the electronic device to perform the tea plant growth monitoring method as described in any one of claims 1 to 5.

8. A computer-readable storage medium, characterized by storing a computer program, wherein the computer program, when executed by a processor, implements the tea plant growth monitoring method as described in any one of claims 1 to 5.

REVENDICATIONS

1. Un procédé de surveillance des conditions de croissance des plants de thé, comprenant : collecte de données de surveillance pour les plants de thé ; les données de surveillance pour les plants de thé comprennent des images vidéo de la croissance des plants de thé, des données spectrales, la teneur en humidité du sol et des données environnementales météorologiques ; prétraitement des données de surveillance des plants de thé pour obtenir une base de données de surveillance ; entrée des données de la base de données de surveillance dans un modèle d'estimation d'image de rendement en feuilles de thé frais pour prédire le rendement des plants de thé ; le modèle d'estimation d'image de rendement en feuilles de thé frais est construit sur la base d'un modèle de réseau pour identifier les bourgeons de feuilles de thé et un modèle de régression ; le modèle de réseau d'identification de bourgeons de feuilles de thé est construit en utilisant des réseaux d'apprentissage profond ; fertilisation automatique des plants de thé en fonction du rendement des plants de thé et de la base de données de surveillance.

2. Le procédé de surveillance des conditions de croissance des plants de thé, tel que revendiqué dans la revendication 1, prétraite les données de surveillance des plants de thé et obtient une base de données de surveillance, il comprend les étapes suivantes : suppression des doublons, mise en forme et remplissage des valeurs manquantes dans les données de surveillance des plants de thé pour obtenir des données complètes ; conversion des données complètes dans un format de données approprié pour obtenir des données valides ; utilisation d'un outil ETL pour transformer les données valides dans un format structuré, résultant en une base de données de collecte ; réalisation de l'intégration des données et de l'établissement des relations de données au sein de la base de collecte pour obtenir la base de données de surveillance.

3. Le procédé de surveillance des conditions de croissance des plants de thé, tel que revendiqué dans la revendication 1, le processus de formation du modèle de

réseau de reconnaissance de la cible de bourgeon de feuilles de thé se déroule

comme suit : obtenir des données d'entraînement ; les données d'entraînement comprennent des images de bourgeons de feuilles de thé ainsi que leurs comptages de bourgeons correspondants ; construire un modèle de réseau d'apprentissage profond YOLOv3 ; entrer les données d'entraînement dans le modèle de réseau d'apprentissage profond YOLOv3 et l'entraîner en fonction de la fonction de perte ; le modèle de réseau d'apprentissage profond YOLOv3 entraîné est ensuite désigné comme le modèle de réseau de reconnaissance de la cible de bourgeon de feuilles de thé.

4. Le procédé de surveillance des conditions de croissance des plants de thé, tel que revendiqué dans la revendication 1, le modèle d'estimation d'image de rendement en feuilles de thé frais est représenté comme suit :

$$YF = NF{\times}SLW/100$$

$$Yg = YF{\times}Ag{\times}C/AF$$

dans la formule du modèle d'estimation d'image de rendement en feuilles de thé frais : YF représente le rendement prédit des plants de thé dans l'image vidéo ; NF représente le nombre de bourgeons de feuilles de thé dans l'image vidéo ; SLW représente le poids de cent bourgeons de feuilles de thé ; Yg représente le rendement estimé des bourgeons de feuilles de thé sur le plant de thé ; Ag représente la superficie de la culture des plants de thé ; C représente le pourcentage de couverture des plants de thé ; AF représente la superficie de l'image capturée.

5. Le procédé de surveillance des conditions de croissance des plants de thé, tel que revendiqué dans la revendication 1, fertilise automatiquement les plants de thé en fonction du rendement des plants de thé et de la base de données de surveillance, il comprend les étapes suivantes : générer des commandes de contrôle de la fertilisation en fonction du rendement des plants de thé et d'un algorithme de décision en matière de fertilisation ; déterminer le plan de fertilisation en corrélant les commandes de contrôle de la fertilisation avec les données associées de la base de données de surveillance ; mettre en œuvre le plan de fertilisation établi en contrôlant un

équipement intégré d'irrigation et de fertilisation pour appliquer automatiquement des engrais aux plants de thé.

6. Un système de surveillance des conditions de croissance des plants de thé, caractérisé par; un module de collecte de données : utilisé pour recueillir des données de surveillance pour les plants de thé ; les données de surveillance des plants de thé comprennent des images vidéo de la croissance des plants de thé, des données spectrales, la teneur en humidité du sol et des données environnementales météorologiques; un module de prétraitement : utilisé pour prétraiter les données de surveillance des plants de thé afin d'obtenir une base de données de surveillance; un module d'estimation du rendement : utilisé pour entrer les données de la base de données de surveillance dans un modèle d'estimation d'image du rendement en feuilles fraîches de thé afin de prédire le rendement des plants de thé ; le modèle d'estimation d'image du rendement en feuilles fraîches de thé est construit sur la base d'un modèle de réseau pour l'identification des bourgeons de feuilles de thé et d'un modèle de régression ; le modèle de réseau d'identification des bourgeons de feuilles de thé est construit à l'aide de réseaux d'apprentissage profond; fertilisation automatique basée sur le rendement des plants de thé et la base de données de surveillance.

7. Un dispositif électronique, caractérisé par l'inclusion d'une unité de stockage et d'un processeur, l'unité de stockage étant utilisée pour stocker un programme informatique, et le processeur exécute le programme informatique pour permettre au dispositif électronique d'exécuter le procédé de surveillance de la croissance des plants de thé tel que décrit dans l'une quelconque des revendications 1 à 5.

8. Un support de stockage lisible par ordinateur, caractérisé par le stockage d'un programme informatique, lequel, lorsqu'il est exécuté par un processeur, met en œuvre le procédé de surveillance de la croissance des plants de thé tel que décrit dans l'une quelconque des revendications 1 à 5.
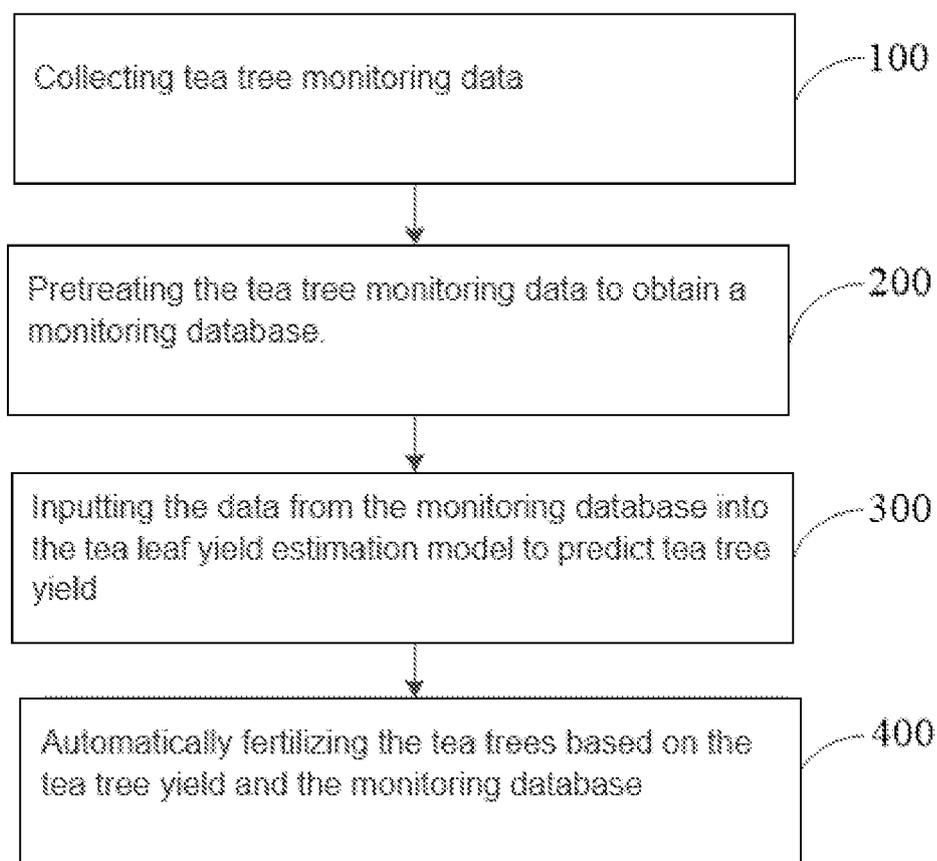
FIGURE   LU505298

Fig.1