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(57) Abstract :
ABSTRACT A SYSTEM BASED ON MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE MODULES FOR PROVIDING IOT NETWORK CONFIGURATION THROUGH USER VOICE AND GESTURE AND METHOD THEREOF [033] The present invention discloses a system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture and method thereof. The system includes, but not limited to, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices; an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices; a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input. Accompanied Drawing [FIG. 1]

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FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

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The Patent Rules, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

TITLE OF THE INVENTION

"A SYSTEM BASED ON MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE MODULES FOR PROVIDING IOT NETWORK CONFIGURATION THROUGH USER VOICE AND GESTURE AND METHOD THEREOF"

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The following specification particularly describes the nature of the invention and the manner in which it is performed:

FIELD OF THE INVENTION

[001] The present invention relates to a system, apparatus and method based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture. More particularly, the present invention relates to a system, apparatus based on the deep learning used for natural language processing and interaction technologies in an IoT environment for Artificial Intelligence-Based Network Configuration Advisor.

BACKGROUND OF THE INVENTION

[002] Configuring and managing wireless communication in IOT environment and for connected device and carrier network issues is crucial for wireless smart communication carriers to provide quality service for their user. Generally, many IoT connection carriers utilize key performance indicators or other types of network performance data to configure and manage the IoT network and mitigate identified problems. For instance, upon receiving a trouble ticket for connecting issues (e.g., non-functioning of the connected device, excessive power utilizing, or a combination of both), network quality for one or more cell sites can be addressed by providing additional resources per user according to demand (e.g., adjusting cell size and shape, power levels, amplifiers, etc.).

[003] Since the Internet, which is a human centered connectivity network where humans generate and consume information, is now evolving to the Internet of Things (IoT) where many user equipment and devices, such as things, exchange and process information without human intervention.

The Internet of Everything (IoE), which is a amalgamation of the IoT systems and methods and the Big Data processing technology through connection with a cloud server, has now emerged. As technology elements, such as, but not limited to, “sensing technology”, “wired/wireless communication and network infrastructure”, “service interface technology”, and “Security technology” have been demanded for IoT implementation, a sensor network, a Machine-to-Machine (M2M) communication, Machine Type Communication (MTC), and so forth have been recently developed.

[004] Such an IoT connectivity may provide an intelligent Internet based services that create a new paradigm to human life by collecting and analyzing data generated among connected things. Now a days, IoT may be used with a variety of fields such as, but not limited to, smart home, smart building, smart city, smart car or connected cars, smart grid, health care, smart appliances and advanced medical services through convergence and combination between existing Information Technology (IT) and various industrial applications.

[005] There is a need to provide control through human voice and gestures, for example configure and/or reconfigure IoT networks, for example based on data obtained from user equipment, and devices. The above information is presented as background information only to assist with an understanding of the disclosure. No determination has been made, and no assertion is made, as to whether any of the above might be applicable as prior art with regard to the disclosure.

[006] While most of the conventional applications for network configuration have a way to do this in a bottom up approach, it doesn't

always fit in where the multiple user can connect and configure the network through their voice and gestures. Accordingly, there remains a need in the prior art for a technical convergence to make the system, apparatus and method compact, it is in this context that the present invention provides an Artificial Intelligence (AI) and Machine learning based system for IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules.

SUMMARY OF THE PRESENT INVENTION

[007] The present invention provides an Artificial Intelligence (AI) and Machine learning based system for IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules and method thereof. The apparatus and method can be provided as a system application tool or electronically over the Internet or the Virtual Private Network VPN to the user's desktop, PDA, or a digital cell, smart phone, or other devices for receiving and processing the predetermined set of data as are known to those skilled in the art.

[008] One aspect of the present invention is to provide a system and method for controlling customizing in an IoT environment a set of user devices, which includes receiving set of instructions from a user in the form of audio data or through a physical gestures by recording the user's live video. The system transcribes the received aforesaid instructions from the user and mapping through Deep learning and Machine learning based techniques. The system then generates a network data analytics functions (NWDAF) and provides the user recommended configuration.

[009] Another aspect of the present invention is to provide, a methodology by implementing the deep learning based interfaces for controlling, preferably configuring and/or reconfiguring, an IoT network comprising a set of user devices including a first user device is provided. The method includes configuring the set of user devices, for example the first user device, for collecting data therefrom, collecting data from the set of user devices, mapping the collected data to a user intent, and controlling, preferably configuring and/or reconfiguring, the IoT network based, at least in part, on the mapped user intent.

[010] The proposed system further proves that it obtains the higher security with less user efforts than other compared network configuration methods. The work can be further extended by combining the proposed method with deep learning and NLP methods. This hybrid model can further extract more refined data to provide IoT connectivity and environment to the user.

[011] The proposed system and method is implemented on, but not limited to, the Field Programmable Gate Arrays (FPGAs) and the like, PC, Microcontroller and with other known processors to have computer algorithms and instruction up gradation for supporting many applications domain where the aforesaid problems to solution is required.

[012] In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the drawings. The invention is capable of other objects and of being practiced and carried out in various ways, according to the need of that industry.

Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[013] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[014] The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

[015] FIG. 1 illustrates an IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules, in accordance with an embodiment of the present invention; and

[016] FIG. 2 illustrates a block diagram for implementing hardware IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules, in accordance with another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[017] In the following detailed description, reference is made to the accompanying drawings which form a part thereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that the embodiments may be combined, or that other embodiments may be utilized and that structural and logical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims and their equivalents.

[018] Referring now to the drawings, there is illustrated, in **FIGS. 1 & 2**, the present invention discloses a system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture and method thereof. The system is comprised of, but not limited to, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices; an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices; a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural

Language Processing Techniques for audio based input and image processing techniques for image based input.

[019] In accordance with another embodiment of the present invention, the processing unit is configured to generate a network data analytics functions (NWDAF) and provides the user recommended configuration. The input data is converted into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

[020] In accordance with another embodiment of the present invention, the processing unit transcribes the received aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules. The output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

[021] In accordance with another embodiment of the present invention, the processing unit stores all weight functions and processing trained and tested data in an online database server. The database server connects the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

[022] In accordance with another embodiment of the present invention, the network configuration includes the task such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

Best mode and working of the system with its mathematical evaluation to enable a person ordinarily skilled in the art of the present invention as given:

[023] The present invention is implemented with the Artificial Intelligence and Machine learning module, an IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules. Further, the artificial intelligence program (AIP) is programmed for IoT network configuration by using the deep learning algorithm.

[024] In accordance with another embodiment of the present invention, various steps performed in the present invention as given, but not limited to:

Step I: Providing, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices.

Step II: Providing, an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices.

Step III: Evaluating, by a plurality of Machine Learning and Artificial Intelligence modules for the provided weight functions for the each of the data input through the image capturing device and the audio recording device.

Step IV: Performing, by a processing unit in an IoT environment, which is designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

Step V: Generating, by the processing unit a network data analytics functions (NWDAF) and provides the user recommended configuration.

Step VI: Converting, the input data into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

Step VII: Transcribing, the processing unit to the receive aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules.

Step VIII: Providing, the output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

Step IX: Recording, by the processing unit all weight functions and processing trained and tested data in an online database server.

Step X: Connecting, the database server for the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

Step XI: Providing, the network configuration includes the task such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

[025] The above-mentioned invention with improved system and method for providing a network configuration by using voice commands and gestures comprising a set of user devices including a first user device is provided. The network is arranged to configure the set of user devices,

for example the first user devices, for collecting data therefrom, collect data from the set of user devices, map the collected data to a user intent, configure and control, preferably IoT network configure and/or reconfigure, the network based, at least in part, on the mapped user intent.

[026] Further, **FIG. 2** provides a block diagram of an exemplary computer system for implementing embodiments consistent with the present disclosure. Variations of computer system may be used for a system based on Machine Learning and Artificial Intelligence modules for an IoT network configuration through user voice and gesture and method thereof. Computer system may comprise a central processing unit ("CPU" or "processor"). Processor 102 may comprise at least one data processor for executing program components for executing user or system-generated requests. A user may include a person, a person using a device such as such as those included in this disclosure, or such a device itself. The processor may include specialized processing units such as integrated system (bus) controllers, memory management control units, floating point units, graphics processing units, digital signal processing units, etc. The processor may include a microprocessor, such as AMD Athlon, Duron or Opteron, ARM's application, embedded or secure processors, IBM PowerPC, Intel's Core, Itanium, Xeon, Celeron or other line of processors, etc. The processor may be implemented using mainframe, distributed processor, multi-core, parallel, grid, or other architectures. Some embodiments may utilize embedded technologies like application-specific integrated circuits (ASICs), digital signal processors (DSPs), Field Programmable Gate Arrays (FPGAs), etc.

[027] Processor may be disposed in communication with one or more input/output (I/O) devices, via I/O interface. The I/O interface may employ communication protocols/methods such as, without limitation, audio, analog, digital, monoaural, RCA, stereo, IEEE-1394, serial bus, universal serial bus (USB), infrared, PS/2, BNC, coaxial, component, composite, digital visual interface (DVI), high-definition multimedia interface (HDMI), RF antennas, S-Video, VGA, IEEE 802.n /b/g/n/x, Bluetooth, cellular (e.g., code-division multiple access (CDMA), high-speed packet access (HSPA+), global system for mobile communications (GSM), long-term evolution (LTE), WiMax, or the like), etc.

[028] In some embodiments, the processor may be disposed in communication with one or more memory devices (e.g., RAM, ROM, etc.) via a storage interface. The storage interface may connect to memory devices including, without limitation, memory drives, removable disc drives, etc., employing connection protocols such as serial advanced technology attachment (SATA), integrated drive electronics (IDE), IEEE-1394, universal serial bus (USB), fiber channel, small computer systems interface (SCSI), etc. The memory drives may further include a drum, magnetic disc drive, magneto-optical drive, optical drive, redundant array of independent discs (RAID), solid-state memory devices, solid-state drives, etc. The memory devices may store a collection of program or database components, including, without limitation, an operating system, user interface application, web browser, mail server, mail client, user/application data(e.g., any data variables or data records discussed in this disclosure), etc. The operating system may facilitate resource management and operation of the computer system. Examples of

operating systems include, without limitation, Apple Macintosh OS X, Unix, Unix-like system distributions (e.g., Berkeley Software Distribution (BSD), FreeBSD, NetBSD, OpenBSD, etc.), Linux distributions (e.g., Red Hat, Ubuntu, Kubuntu, etc.), IBM OS/2, Microsoft Windows (XP, Vista/7/8, etc.), Apple iOS, Google Android, Blackberry OS, or the like.

[029] The word “module,” “model” “algorithms” and the like as used herein, refers to logic embodied in hardware or firmware, or to a collection of software instructions, written in a programming language, such as, for example, Java, C, Python or assembly. One or more software instructions in the modules may be embedded in firmware, such as an EPROM. It will be appreciated that modules may comprised connected logic units, such as gates and flip-flops, and may comprise programmable units, such as programmable gate arrays or processors. The modules described herein may be implemented as either software and/or hardware modules and may be stored in any type of computer-readable medium or other computer storage device. Further, in various embodiments, the processor is one of, but not limited to, a general-purpose processor, an application specific integrated circuit (ASIC) and a field-programmable gate array (FPGA) processor. Furthermore, the data repository may be a cloud-based storage or a hard disk drive (HDD), Solid state drive (SSD), flash drive, ROM or any other data storage means.

[030] It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-discussed embodiments may be used in combination with each other. Many other

embodiments will be apparent to those of skill in the art upon reviewing the above description.

[031] The benefits and advantages which may be provided by the present invention have been described above with regard to specific embodiments. These benefits and advantages, and any elements or limitations that may cause them to occur or to become more pronounced are not to be construed as critical, required, or essential features of any or all of the embodiments.

[032] While the present invention has been described with reference to particular embodiments, it should be understood that the embodiments are illustrative and that the scope of the invention is not limited to these embodiments. Many variations, modifications, additions and improvements to the embodiments described above are possible. It is contemplated that these variations, modifications, additions and improvements fall within the scope of the invention.

We Claim:

1. A system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture, comprising:

an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices;

an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices;

a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and

a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

2. The system as claimed in claim **1**, wherein the processing unit is configured to generate a network data analytics functions (NWDAF) and provides the user recommended configuration.

3. The system as claimed in claim **1**, wherein the input data is converted into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

4. The system as claimed in claim **1**, wherein the processing unit transcribes the received aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules.

5. The system as claimed in claim **1**, wherein the output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

6. The system as claimed in claim **1**, wherein the processing unit stores all weight functions and processing trained and tested data in an online database server.

7. The system as claimed in claim **1**, wherein the database server connects the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

8. The system as claimed in claim **1**, wherein the network configuration includes various networking tasks such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

Dated this 26th day of May, 2021

Signature: S. Jay. Pra

Applicant(s)

Mr.S.Jaya Prakash et. al.

ABSTRACT

A SYSTEM BASED ON MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE MODULES FOR PROVIDING IOT NETWORK CONFIGURATION THROUGH USER VOICE AND GESTURE AND METHOD THEREOF

[033] The present invention discloses a system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture and method thereof. The system includes, but not limited to, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices; an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices; a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

Accompanied Drawing **[FIG. 1]**

Dated this 26th day of May, 2021

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Mr.S.Jaya Prakash et. al.

FORM 2

THE PATENTS ACT, 1970

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COMPLETE SPECIFICATION

(See section 10 and rule 13)

TITLE OF THE INVENTION

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The following specification particularly describes the nature of the invention and the manner in which it is performed:

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[001] The present invention relates to a system, apparatus and method based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture. More particularly, the present invention relates to a system, apparatus based on the deep learning used for natural language processing and interaction technologies in an IoT environment for Artificial Intelligence-Based Network Configuration Advisor.

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The Internet of Everything (IoE), which is a amalgamation of the IoT systems and methods and the Big Data processing technology through connection with a cloud server, has now emerged. As technology elements, such as, but not limited to, “sensing technology”, “wired/wireless communication and network infrastructure”, “service interface technology”, and “Security technology” have been demanded for IoT implementation, a sensor network, a Machine-to-Machine (M2M) communication, Machine Type Communication (MTC), and so forth have been recently developed.

[004] Such an IoT connectivity may provide an intelligent Internet based services that create a new paradigm to human life by collecting and analyzing data generated among connected things. Now a days, IoT may be used with a variety of fields such as, but not limited to, smart home, smart building, smart city, smart car or connected cars, smart grid, health care, smart appliances and advanced medical services through convergence and combination between existing Information Technology (IT) and various industrial applications.

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[006] While most of the conventional applications for network configuration have a way to do this in a bottom up approach, it doesn't

always fit in where the multiple user can connect and configure the network through their voice and gestures. Accordingly, there remains a need in the prior art for a technical convergence to make the system, apparatus and method compact, it is in this context that the present invention provides an Artificial Intelligence (AI) and Machine learning based system for IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules.

SUMMARY OF THE PRESENT INVENTION

[007] The present invention provides an Artificial Intelligence (AI) and Machine learning based system for IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules and method thereof. The apparatus and method can be provided as a system application tool or electronically over the Internet or the Virtual Private Network VPN to the user's desktop, PDA, or a digital cell, smart phone, or other devices for receiving and processing the predetermined set of data as are known to those skilled in the art.

[008] One aspect of the present invention is to provide a system and method for controlling customizing in an IoT environment a set of user devices, which includes receiving set of instructions from a user in the form of audio data or through a physical gestures by recording the user's live video. The system transcribes the received aforesaid instructions from the user and mapping through Deep learning and Machine learning based techniques. The system then generates a network data analytics functions (NWDAF) and provides the user recommended configuration.

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[010] The proposed system further proves that it obtains the higher security with less user efforts than other compared network configuration methods. The work can be further extended by combining the proposed method with deep learning and NLP methods. This hybrid model can further extract more refined data to provide IoT connectivity and environment to the user.

[011] The proposed system and method is implemented on, but not limited to, the Field Programmable Gate Arrays (FPGAs) and the like, PC, Microcontroller and with other known processors to have computer algorithms and instruction up gradation for supporting many applications domain where the aforesaid problems to solution is required.

[012] In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the drawings. The invention is capable of other objects and of being practiced and carried out in various ways, according to the need of that industry.

Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[013] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[014] The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

[015] FIG. 1 illustrates an IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules, in accordance with an embodiment of the present invention; and

[016] FIG. 2 illustrates a block diagram for implementing hardware IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules, in accordance with another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[017] In the following detailed description, reference is made to the accompanying drawings which form a part thereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that the embodiments may be combined, or that other embodiments may be utilized and that structural and logical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined by the appended claims and their equivalents.

[018] Referring now to the drawings, there is illustrated, in **FIGS. 1 & 2**, the present invention discloses a system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture and method thereof. The system is comprised of, but not limited to, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices; an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices; a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural

Language Processing Techniques for audio based input and image processing techniques for image based input.

[019] In accordance with another embodiment of the present invention, the processing unit is configured to generate a network data analytics functions (NWDAF) and provides the user recommended configuration. The input data is converted into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

[020] In accordance with another embodiment of the present invention, the processing unit transcribes the received aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules. The output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

[021] In accordance with another embodiment of the present invention, the processing unit stores all weight functions and processing trained and tested data in an online database server. The database server connects the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

[022] In accordance with another embodiment of the present invention, the network configuration includes the task such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

Best mode and working of the system with its mathematical evaluation to enable a person ordinarily skilled in the art of the present invention as given:

[023] The present invention is implemented with the Artificial Intelligence and Machine learning module, an IoT network configuration through user voice and gesture based on Machine Learning and Artificial Intelligence modules. Further, the artificial intelligence program (AIP) is programmed for IoT network configuration by using the deep learning algorithm.

[024] In accordance with another embodiment of the present invention, various steps performed in the present invention as given, but not limited to:

Step I: Providing, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices.

Step II: Providing, an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices.

Step III: Evaluating, by a plurality of Machine Learning and Artificial Intelligence modules for the provided weight functions for the each of the data input through the image capturing device and the audio recording device.

Step IV: Performing, by a processing unit in an IoT environment, which is designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

Step V: Generating, by the processing unit a network data analytics functions (NWDAF) and provides the user recommended configuration.

Step VI: Converting, the input data into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

Step VII: Transcribing, the processing unit to the receive aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules.

Step VIII: Providing, the output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

Step IX: Recording, by the processing unit all weight functions and processing trained and tested data in an online database server.

Step X: Connecting, the database server for the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

Step XI: Providing, the network configuration includes the task such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

[025] The above-mentioned invention with improved system and method for providing a network configuration by using voice commands and gestures comprising a set of user devices including a first user device is provided. The network is arranged to configure the set of user devices,

for example the first user devices, for collecting data therefrom, collect data from the set of user devices, map the collected data to a user intent, configure and control, preferably IoT network configure and/or reconfigure, the network based, at least in part, on the mapped user intent.

[026] Further, **FIG. 2** provides a block diagram of an exemplary computer system for implementing embodiments consistent with the present disclosure. Variations of computer system may be used for a system based on Machine Learning and Artificial Intelligence modules for an IoT network configuration through user voice and gesture and method thereof. Computer system may comprise a central processing unit ("CPU" or "processor"). Processor 102 may comprise at least one data processor for executing program components for executing user or system-generated requests. A user may include a person, a person using a device such as such as those included in this disclosure, or such a device itself. The processor may include specialized processing units such as integrated system (bus) controllers, memory management control units, floating point units, graphics processing units, digital signal processing units, etc. The processor may include a microprocessor, such as AMD Athlon, Duron or Opteron, ARM's application, embedded or secure processors, IBM PowerPC, Intel's Core, Itanium, Xeon, Celeron or other line of processors, etc. The processor may be implemented using mainframe, distributed processor, multi-core, parallel, grid, or other architectures. Some embodiments may utilize embedded technologies like application-specific integrated circuits (ASICs), digital signal processors (DSPs), Field Programmable Gate Arrays (FPGAs), etc.

[027] Processor may be disposed in communication with one or more input/output (I/O) devices, via I/O interface. The I/O interface may employ communication protocols/methods such as, without limitation, audio, analog, digital, monoaural, RCA, stereo, IEEE-1394, serial bus, universal serial bus (USB), infrared, PS/2, BNC, coaxial, component, composite, digital visual interface (DVI), high-definition multimedia interface (HDMI), RF antennas, S-Video, VGA, IEEE 802.n /b/g/n/x, Bluetooth, cellular (e.g., code-division multiple access (CDMA), high-speed packet access (HSPA+), global system for mobile communications (GSM), long-term evolution (LTE), WiMax, or the like), etc.

[028] In some embodiments, the processor may be disposed in communication with one or more memory devices (e.g., RAM, ROM, etc.) via a storage interface. The storage interface may connect to memory devices including, without limitation, memory drives, removable disc drives, etc., employing connection protocols such as serial advanced technology attachment (SATA), integrated drive electronics (IDE), IEEE-1394, universal serial bus (USB), fiber channel, small computer systems interface (SCSI), etc. The memory drives may further include a drum, magnetic disc drive, magneto-optical drive, optical drive, redundant array of independent discs (RAID), solid-state memory devices, solid-state drives, etc. The memory devices may store a collection of program or database components, including, without limitation, an operating system, user interface application, web browser, mail server, mail client, user/application data(e.g., any data variables or data records discussed in this disclosure), etc. The operating system may facilitate resource management and operation of the computer system. Examples of

operating systems include, without limitation, Apple Macintosh OS X, Unix, Unix-like system distributions (e.g., Berkeley Software Distribution (BSD), FreeBSD, NetBSD, OpenBSD, etc.), Linux distributions (e.g., Red Hat, Ubuntu, Kubuntu, etc.), IBM OS/2, Microsoft Windows (XP, Vista/7/8, etc.), Apple iOS, Google Android, Blackberry OS, or the like.

[029] The word “module,” “model” “algorithms” and the like as used herein, refers to logic embodied in hardware or firmware, or to a collection of software instructions, written in a programming language, such as, for example, Java, C, Python or assembly. One or more software instructions in the modules may be embedded in firmware, such as an EPROM. It will be appreciated that modules may comprised connected logic units, such as gates and flip-flops, and may comprise programmable units, such as programmable gate arrays or processors. The modules described herein may be implemented as either software and/or hardware modules and may be stored in any type of computer-readable medium or other computer storage device. Further, in various embodiments, the processor is one of, but not limited to, a general-purpose processor, an application specific integrated circuit (ASIC) and a field-programmable gate array (FPGA) processor. Furthermore, the data repository may be a cloud-based storage or a hard disk drive (HDD), Solid state drive (SSD), flash drive, ROM or any other data storage means.

[030] It is to be understood that the above description is intended to be illustrative, and not restrictive. For example, the above-discussed embodiments may be used in combination with each other. Many other

embodiments will be apparent to those of skill in the art upon reviewing the above description.

[031] The benefits and advantages which may be provided by the present invention have been described above with regard to specific embodiments. These benefits and advantages, and any elements or limitations that may cause them to occur or to become more pronounced are not to be construed as critical, required, or essential features of any or all of the embodiments.

[032] While the present invention has been described with reference to particular embodiments, it should be understood that the embodiments are illustrative and that the scope of the invention is not limited to these embodiments. Many variations, modifications, additions and improvements to the embodiments described above are possible. It is contemplated that these variations, modifications, additions and improvements fall within the scope of the invention.

We Claim:

1. A system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture, comprising:

an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices;

an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices;

a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and

a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

2. The system as claimed in claim **1**, wherein the processing unit is configured to generate a network data analytics functions (NWDAF) and provides the user recommended configuration.

3. The system as claimed in claim **1**, wherein the input data is converted into weight functions through the various deep learning model and creating a neural network for providing the trained data to the processing unit.

4. The system as claimed in claim **1**, wherein the processing unit transcribes the received aforesaid instructions from the user and mapping through Deep learning, Artificial Intelligence and Machine learning modules.

5. The system as claimed in claim **1**, wherein the output data provides to configure the network configuration between a user device and one or more other devices present in the IoT environment.

6. The system as claimed in claim **1**, wherein the processing unit stores all weight functions and processing trained and tested data in an online database server.

7. The system as claimed in claim **1**, wherein the database server connects the user with requisite previous settings on repeating the similar gestures or voice commands with a very less efforts and quickly by providing options or hints with the lastly network settings.

8. The system as claimed in claim **1**, wherein the network configuration includes various networking tasks such as, but not limited to, adding new device, deleting the previous connected devices, commanding for a requisite function to other device, setting protocols and customizing user function for connecting device and the like.

Dated this 26th day of May, 2021

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Applicant(s)

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ABSTRACT

A SYSTEM BASED ON MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE MODULES FOR PROVIDING IOT NETWORK CONFIGURATION THROUGH USER VOICE AND GESTURE AND METHOD THEREOF

[033] The present invention discloses a system based on Machine Learning and Artificial Intelligence modules for providing IoT network configuration through user voice and gesture and method thereof. The system includes, but not limited to, an image capturing device for receiving the live gesture of the user for defining the network configuration between the IoT devices; an audio recording device for receiving the voice command of the user for defining the network configuration between the IoT devices; a plurality of Machine Learning and Artificial Intelligence modules for evaluating the provided weight function for the each of the data input through the image capturing device and the audio recording device; and a processing unit in an IoT environment designed to process and perform mapping of a plurality of weight functions using Natural Language Processing Techniques for audio based input and image processing techniques for image based input.

Accompanied Drawing **[FIG. 1]**

Dated this 26th day of May, 2021

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