FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

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The Patent Rules, 2003

COMPLETE SPECIFICATION

(See sections 10 & rule 13)

1. TITLE OF THE INVENTION

A PORTABLE SNAKE DETECTION AND WARNING DEVICE

2. APPLICANT (S)

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed.

A PORTABLE SNAKE DETECTION AND WARNING DEVICE

TECHNICAL FIELD

[001] The present disclosure relates to the field of electronics. In particular, the present disclosure relates to audio signals intuition. More particularly, the present disclosure relates to a portable device to detect snakes with hiss intuition decoding and a warning system.

BACKGROUND

[002] The background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[003] Snake bite is an injury caused by a bite of a snake, especially a venomous snake. It is a neglected public health problem in tropical and subtropical countries, where rural populations are mainly affected. Snakes are very common in rural areas with farms and agriculture as they actively prey on pests such as mice and rats. Majority of the snake bites happen in rural areas because the bed is likely to be low to the ground (or on the ground) and likely the only heat source in the building. This would entice any snake in the building and looking for heat to head directly to the bed. The same experience is common for farmers when they are walking in farms at night

[004] It is a common occupational hazard mainly in farmers, plantation workers, herders and labourers leading to significant morbidity and mortality that remains largely unreported. These groups often lack even the most basic protections such as snake-proof footwear or bed nets.

[005] The most affected region in the world is South East Asia because of dense population and extensive agricultural practices. Snake bites are now a "global health priority" according to a new resolution passed by the World Health Organization (WHO) and WHO has included snake bite in its list of neglected tropical conditions in 2009. The true global burden of snake bite is not known due to lack of standardized reporting and underreporting. It is documented that there are 54,00,000 snake bites with 2,50,000 ‘envenomation’ and around 1,25,000 fatalities annually in the world.

[006] According to the World Health Organization (WHO) around five million snake bites occur each year, although venom is only injected in just over half of cases. From

blindness to amputations, hundreds of thousands of people are left with permanent disability after being attacked by snakes. The WHO describes such cases as among the most neglected tropical diseases. With some 50,000 citizens dying annually from snakebites, India is compelled to explore a range of effective methods to deal with the problem, which the WHO characterises as a neglected tropical disease. India accounts for about half of all global snakebite deaths.

[007] Efforts have been made in the past to overcome problem associated with snake detection and warning. Snake repellent are commercially available, but they not apt due to its bulkiness. Being bulky, it is not practical to be used while walking during night times through agricultural farms in rural areas. Also, it is not accurate and efficient as it fails to work on plywood and filter paper during night-time and shows 50% results on cloth.

[008] The existing technique of using a temperature sensor can detect the heat radiations from the snake, however they are not a viable option owing to the fact that they are highly priced. Further, at high-temperature, the thermal sensors are susceptible to in-homogeneity. Moreover, image processing technology cannot be used for the purpose as it is expensive, and its accuracy is affected by the obstructions in the path of the sensors.

[009] If sound frequency sensor is used to detect snakes in the device, it becomes extremely bulky, because the mic operates at 80 Hz to 15 KHz with non-linear response throughout the bandwidth. Anything lesser than 80 Hz is difficult to detect and the size of detector is inversely proportional to frequency, making it bulky and impractical.

[0010] There is therefore a need in the art to provide a portable snake detecting device that overcome the above-mentioned and other limitations of the existing solutions and utilize techniques, which are portable, robust, accurate, efficient, cost effective and simple.

OBJECTS OF THE PRESENT DISCLOSURE

[0011] Some of the objects of the present disclosure, which at least one embodiment herein satisfies are as listed herein below.

[0012] It is an object of the present disclosure to provide a snake detection and warning device.

[0013] It is another object of the present disclosure to provide a snake detection and warning device that is configured to detect snakes in real time from a pre-defined proximity of the device.

[0014] It is another object of the present disclosure to provide a snake detection and warning device that generate any or a combination of an audio and a visual alert upon detection of the snake in the pre-defined close proximity of the device.

[0015] It is another object of the present disclosure to provide a snake detection and warning device that is portable, accurate, efficient and cost effective.

SUMMARY

[0016] The present disclosure relates to the field of electronics. In particular, the present disclosure relates to a portable device to detect snakes with hiss intuition decoding and a warning system.

[0017] According to an aspect, the present disclosure provides a snake detection and warning device, the device includes: a set of sensors configured to sense in real time one or more signals from a pre-defined proximity of the device, said sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz; a control unit comprising of one or more processors coupled to a dataset storage memory and the set of sensors, to classify the sensed signal by matching the extracted one or more parameters with a pre-loaded dataset; wherein the control unit generate an alert signal based on positive matching of the extracted one or more parameters and the pre-loaded dataset, and an alert unit operatively coupled with the control unit, wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal which is indicative of detection of the snake in the pre-defined close proximity of the device.

[0018] In an embodiment, the resonating device comprises vibrating plates configured such that to enable sensing of frequencies less than about 80 hertz, reducing the bulkiness microphone and reduce complexity of processing and classifying the sensed one or more signals.

[0019] In an embodiment, the device comprises an alert unit operatively coupled with the control unit, and wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal.

[0020] In an embodiment, the alert unit comprises a vibration unit, and wherein the vibration unit to provide vibration alert based on the generated alert signal.

[0021] In an embodiment, the set of sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz.

[0022] In an embodiment, the device comprises an illumination unit to illuminate the area in close proximity of the device.

[0023] In an embodiment, the control unit comprises of one or more processors coupled to a storage memory configured such that to classify the sensed signals by matching the extracted parameters with a pre-loaded dataset comprising a set of intensities and frequencies of one or more sound signals associated with snakes and generate an alert signal based on positive matching of the extracted parameters and the pre-loaded dataset.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] In the figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label with a second label that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

[0025] FIG. 1A illustrates an exemplary snake detection and warning device in accordance with an embodiment of the present disclosure.

[0026] FIG. 1B illustrates an exemplary snake detection and warning device in accordance with an embodiment of the present disclosure.

[0027] FIG. 2 illustrates a flow diagram illustrating the process of snake detection and warning device in accordance with an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0028] In the following description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. It will be apparent to one skilled in the art that embodiments of the present invention may be practiced without some of these specific details.

[0029] Embodiments of the present invention include various steps, which will be described below. The steps may be performed by hardware components or may be embodied in machine-executable instructions, which may be used to cause a general-purpose or special-purpose processor programmed with the instructions to perform the steps. Alternatively, steps may be performed by a combination of hardware, software, firmware and/or by human operators.

[0030] Embodiments of the present invention may be provided as a computer program product, which may include a machine-readable storage medium tangibly embodying thereon instructions, which may be used to program a computer (or other electronic devices) to perform a process. The machine-readable medium may include, but is not limited to, fixed (hard) drives, magnetic tape, floppy diskettes, optical disks, compact disc read-only memories (CD-ROMs), and magneto-optical disks, semiconductor memories, such as ROMs, PROMs, random access memories (RAMs), programmable read-only memories (PROMs), erasable PROMs (EPROMs), electrically erasable PROMs (EEPROMs), flash memory, magnetic or optical cards, or other type of media/machine-readable medium suitable for storing electronic instructions (e.g., computer programming code, such as software or firmware).

[0031] Various methods described herein may be practiced by combining one or more machine-readable storage media containing the code according to the present invention with appropriate standard computer hardware to execute the code contained therein. An apparatus for practicing various embodiments of the present invention may involve one or more computers (or one or more processors within a single computer) and storage systems containing or having network access to computer program(s) coded in accordance with various methods described herein, and the method steps of the invention could be accomplished by modules, routines, subroutines, or subparts of a computer program product.

[0032] If the specification states a component or feature “may”, “can”, “could”, or “might” be included or have a characteristic, that particular component or feature is not required to be included or have the characteristic.

[0033] As used in the description herein and throughout the claims that follow, the meaning of “a,” “an,” and “the” includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein, the meaning of “in” includes “in” and “on” unless the context clearly dictates otherwise.

[0034] Exemplary embodiments will now be described more fully hereinafter with reference to the accompanying drawings, in which exemplary embodiments are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. These embodiments are provided so that this invention will be thorough and complete and will fully convey the scope of the invention to those of ordinary skill in the art. Moreover, all statements herein reciting embodiments of the invention, as well as specific examples thereof, are intended to encompass both structural and functional equivalents thereof. Additionally, it is intended that such equivalents include both

currently known equivalents as well as equivalents developed in the future (i.e., any elements developed that perform the same function, regardless of structure).

[0035] While embodiments of the present invention have been illustrated and described, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions, and equivalents will be apparent to those skilled in the art, without departing from the spirit and scope of the invention, as described in the claim.

[0036] The present disclosure relates to the field of electronics. In particular, the present disclosure relates to a portable device to detect snakes with hiss intuition decoding and a warning system.

[0037] According to an aspect, the present disclosure provides a snake detection and warning device, the device includes: a set of sensors configured to sense in real time one or more signals from a pre-defined proximity of the device, said sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz; a control unit comprising of one or more processors coupled to a dataset storage memory and the set of sensors, to classify the sensed signal by matching the extracted one or more parameters with a pre-loaded dataset; wherein the control unit generate an alert signal based on positive matching of the extracted one or more parameters and the pre-loaded dataset, and an alert unit operatively coupled with the control unit, wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal which is indicative of detection of the snake in the pre-defined close proximity of the device.

[0038] In an embodiment, the resonating device comprises vibrating plates configured such that to enable sensing of frequencies less than about 80 hertz, reducing the bulkiness microphone and reduce complexity of processing and classifying the sensed one or more signals.

[0039] In an embodiment, the device comprises an alert unit operatively coupled with the control unit, and wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal.

[0040] In an embodiment, the alert unit comprises a vibration unit, and wherein the vibration unit to provide vibration alert based on the generated alert signal.

[0041] In an embodiment, the set of sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz.

[0042] In an embodiment, the device comprises an illumination unit to illuminate the area in close proximity of the device.

[0043] In an embodiment, the control unit comprises of one or more processors coupled to a storage memory configured such that to classify the sensed signals by matching the extracted parameters with a pre-loaded dataset comprising a set of intensities and frequencies of one or more sound signals associated with snakes and generate an alert signal based on positive matching of the extracted parameters and the pre-loaded dataset.

[0044] FIGs. 1A and 1B illustrates exemplary device with attached and detached torch and FIG. 2 illustrates a flow diagram illustrating the working of snake detection and warning device in accordance with an embodiment of the present disclosure.

[0045] In an embodiment, an apparatus for snake detection and warning device 100 can include a casing. The casing can be used for housing various components of the device 100. The device 100 can include a set of sensors 104 for sensing one or more signals from in proximity of the device 100. The set of sensors 104 can includea microphone for sensing various signals from area close to the device. The area can include but not limited to 5 metres in either direction from the set of sensors 104.

[0046] In an embodiment, the set of sensors 104 enable sensing of frequencies less than about 80 hertz as the snake generates a very low frequency in the range of 10 Hz to 70 Hz. Snakes make specific low frequency sounds both in hibernation and active mode. The sibilance of snakes produces specific low frequency and the intensity depends on the species of the snake.

[0047] Further, the microphone can be configured such that it can capture frequencies lower than 80 Hz. The microphone can be coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz. As the microphone is resonator device, the frequency that microphone can capture depends on resonant frequency. Resonance is defined as the increase in the amplitude of the oscillation of an electric system or a mechanical system exposed to a periodic force whose frequency is similar to that of natural undamped frequency of the system. A device that exhibits resonance is called a resonator. A resonator naturally oscillates with greater amplitude at some frequencies, called resonant frequencies. Attenuation and noise are minimum at the resonant frequency. Resonators can either be used to generate waves of specific frequencies to select a particular range of frequencies from the signal. Therefore, microphone can detect one or more signals in a frequency range of 10 Hz to 1 KHz. Since the size of a detector for signals is inversely

proportional to the frequency of the signals. The microphone can include vibrating plates configured such that to reduce the bulkiness.

[0048] In an embodiment, the device 100 can include an illumination unit 102 for providing illumination in case of dark or low illumination scenario. The illumination unit 102 can include a bulb, an LED, a CFL and the like to provide illumination.

[0049] In an embodiment, the device 100 can include a control unit 108. In an embodiment, the control unit 108 can include one or more processors or controllers. Examples of controllers include, but are not limited to PIC® 16F877A microcontroller, AVR ® ATmega8 & ATmega16, Renesas® microcontroller and the like. Examples of processor can include, but are not limited to, an Intel® Itanium® or Itanium 2 processor(s), or AMD® Opteron® or Athlon MP® processor(s), Motorola® lines of processors, FortiSOC™ system on a chip processors or other future processors.

[0050] In an embodiment, the control unit 108 configured to extract one or more parameters from the from the sensed signals. The one or more parameters includes but not limited to frequency, amplitude, intensity of each of the sensed one or more signals. Further, the control unit 108 configured to classify the sensed one or more signals by comparing or matching the extracted one or more parameters of the sensed one or more signals with a preloaded dataset. The dataset can comprise a set of intensities, intensities and the like.

[0051] In an embodiment, now based on classification of the one or more sound signals a sound (generally in form of hiss) produced by snake can be recognized. Now, based on recognition an alert signal can be generated such that the alert signal signifies existence of snake in an area in close proximity of the device 100.

[0052] In an embodiment, the device 100 can include an alert unit 106. The alert unit 106 can be used for providing any or a combination of a visual alert, an audio alert and vibration alert based on the generated alert signal. The alert unit 106 can include but not limited to a vibrating element for providing vibration alert, or a light source to provide visual alert and a sound source to provide the audio alert.

[0053] In an embodiment, the various components of the device 100 can be built or moulded such that any of the components can be detachable from the device without straying away from a basic function of detection of the snake and further based on detection generate an alert.

[0054] FIG. 2 illustrates a flow diagram illustrating the process of snake detection and warning device in accordance with an embodiment of the present disclosure.

[0055] In context to flow diagram 200. Block 202 can pertain to receiving one or more sound signals from a set of sensors that can pertain to audio signal from insects, or animals, surrounding sounds or sound produced by snake. further, block 204 pertains to classification of the received sound using classifier. Parameters can be extracted from the received signals and then the extracted parameters can be matched with prestored signals. The prestored signals can be stored on a database as illustrated by clock 206. Further, block 208 pertains to detection of the snake and generating an alert based on detection of the snake.

[0056] In an embodiment, the device 100 would enable detection of the snake in close proximity of the device 100 irrespective of climate (hot, rainy or cold). Thereby, can be used in tropical areas, remote areas for detection of the snake in surrounding area thereby avoiding any conflict of a human and the snake and thus can be helpful in reducing death or fatal injuries due to snake attack.

[0057] Thus, it will be appreciated by those of ordinary skill in the art that the diagrams, schematics, illustrations, and the like represent conceptual views or processes illustrating systems and methods embodying this invention. The functions of the various elements shown in the figures may be provided through the use of dedicated hardware as well as hardware capable of executing associated software. Similarly, any switches shown in the figures are conceptual only. Their function may be carried out through the operation of program logic, through dedicated logic, through the interaction of program control and dedicated logic, or even manually, the particular technique being selectable by the entity implementing this invention. Those of ordinary skill in the art further understand that the exemplary hardware, software, processes, methods, and/or operating systems described herein are for illustrative purposes and, thus, are not intended to be limited to any particular named.

[0058] While embodiments of the present invention have been illustrated and described, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions, and equivalents will be apparent to those skilled in the art, without departing from the spirit and scope of the invention, as described in the claim.

[0059] In the foregoing description, numerous details are set forth. It will be apparent, however, to one of ordinary skill in the art having the benefit of this disclosure, that the present invention may be practiced without these specific details. In some instances, well-known structures and devices are shown in block diagram form, rather than in detail, to avoid obscuring the present invention.

[0060] As used herein, and unless the context dictates otherwise, the term "coupled to" is intended to include both direct coupling (in which two elements that are coupled to each other contact each other) and indirect coupling (in which at least one additional element is located between the two elements). Therefore, the terms "coupled to" and "coupled with" are used synonymously. Within the context of this document terms "coupled to" and "coupled with" are also used euphemistically to mean “communicatively coupled with” over a network, where two or more devices are able to exchange data with each other over the network, possibly via one or more intermediary device.

[0061] It should be apparent to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms “comprises” and “comprising” should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refers to at least one of something selected from the group consisting of A, B, C …. and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

[0062] While the foregoing describes various embodiments of the invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof. The scope of the invention is determined by the claims that follow. The invention is not limited to the described embodiments, versions or examples, which are included to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to the person having ordinary skill in the art.

ADVANTAGES OF THE PRESENT DISCLOSURE

[0063] The present disclosure provides a portable device to detect snakes with hiss intuition decoding and a warning system.

[0064] The present disclosure provides a snake detecting and warning device that does not require expensive and fragile sensors like camera and temperature sensors to detect the presence of snake in pre-defined proximity of the device.

[0065] The present disclosure provides a snake detecting and warning device uses sensors comprises of microphone, wherein a resonating device and vibrating plates are configured to make the device portable as majority of snake bite cases happen in rural and agricultural fields.

Snake generates a very low frequency in the range of 10 Hz to 70 Hz. The present disclosure provides a snake detecting and warning device uses processors and sensors comprises of microphone, wherein a resonating device and vibrating plates are configured to sense frequencies less than about 80 hertz reduce complexity and processing speed, making the device fast, efficient and simple.

FOR CHITKARA INNOVATION INCUBATOR FOUNDATION

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Dated: 12th July, 2019

We Claim:

1. A portable snake detection and warning device, said device comprising:

a set of sensors configured to sense in real time one or more signals from a pre-defined proximity of the device;

a control unit operatively coupled to the set of sensors, the control unit comprising one or more processors coupled to a memory, the memory storing instructions executable by the processor to:

extract one or more parameters pertaining to frequency and intensity of the sensed one or more signals, wherein the extracted one or more parameters are associated with the sensed one or more signals; and

classify the sensed one or more signals by matching the extracted one or more parameters with a pre-loaded dataset comprising a set of intensities and frequencies of one or more sound signals associated with snakes; and

generate an alert signal based on positive matching of the extracted one or more parameters and the pre-loaded dataset;

wherein the generated alert signal is indicative of detection of the snake in the pre-defined close proximity of the device.

2. The device as claimed in claim 1, wherein the device comprises an alert unit operatively coupled with the control unit, and wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal.
3. The device as claimed in claim 2, wherein the alert unit comprises a vibration unit, and wherein the vi
4. The device as claimed in claim 1, wherein the set of sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz.
5. The device as claimed in claim 4, wherein the resonating device comprises vibrating plates configured such that to enable sensing of frequencies less than about 80 hertz.
6. The device as claimed in claim 4, the resonating device comprises vibrating plates configured such that to reduce the bulkiness of microphone and reduce complexity of processing and classifying one or more parameters pertaining to frequency and intensity of the sensed one or more signals.

7. The device as claimed in claim 1, wherein the device comprises an illumination unit to illuminate the area in close proximity of the device.

FOR CHITKARA INNOVATION INCUBATOR FOUNDATION

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ABSTRACT

A PORTABLE SNAKE DETECTION AND WARNING DEVICE

According to an embodiment of the present disclosure a portable device to detect snakes with hiss intuition decoding and generating a warning is disclosed. The device includes: a set of sensors configured to sense in real time one or more signals from a pre-defined proximity of the device, said sensors comprises a microphone coupled with a resonating device to enable sensing of the one or more signals in a frequency range of 10 Hz to 1 KHz; a control unit comprising of one or more processors coupled to a dataset storage memory and the set of sensors, to classify the sensed signal by matching the extracted one or more parameters with a pre-loaded dataset; wherein, the pre-loaded dataset comprising a set of intensities and frequencies of one or more sound signals associated with snakes; wherein the control unit generate an alert signal based on positive matching of the extracted one or more parameters and the pre-loaded dataset, and an alert unit operatively coupled with the control unit, wherein the alert unit configured to generate any or a combination of an audio and a visual alert based on the generated alert signal which is indicative of detection of the snake in the pre-defined close proximity of the device.

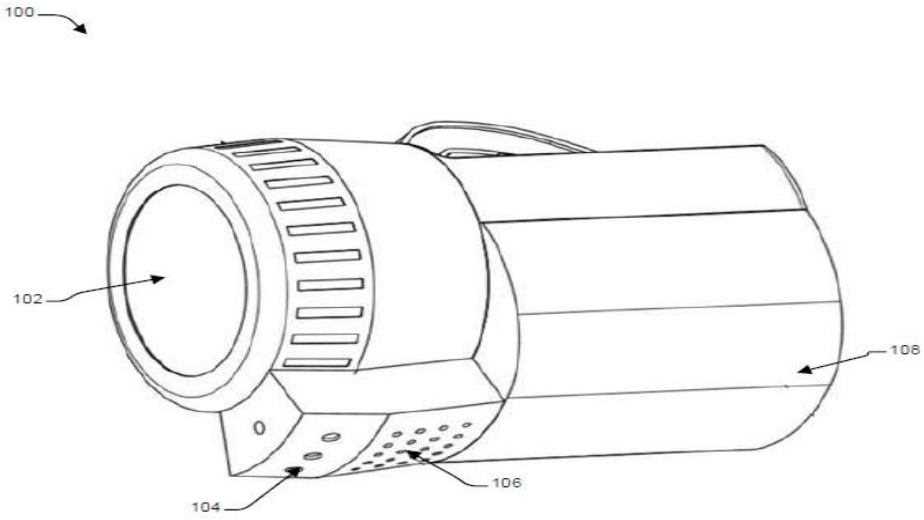

FIG. 1A

FOR CHITKARA INNOVATION INCUBATOR FOUNDATION

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