Everyday Life Quarantine Robot for the Post-Coronavirus age

Contactless Care Robot

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CONTACTLESS CARE ROBOT

Keemj
Efforts in everyday life quarantine are still needed even with the development of vaccines, which is why a sustainable everyday life quarantine system is necessary.

Everyday life quarantine that requires manual work and human intervention is not sustainable. However, an automation-based sustainable everyday life quarantine system is made possible using AI, Data, 5G, and robotics.
Everyday Life Quarantine Robot, a feat of K-Quarantine pride and advanced 5G technology

Safety measures against COVID-19

- Wearing face masks
- Social distancing
- Washing hands
- Cleaning and sterilizing
- Staying healthy and maintaining a good environment

All-in-One Total Solution

Do you do each anti-epidemic activity separately, such as thermometer installation, sterilization, hand sanitizer placement, and quarantine guidance? Leave it all to Keemi, and you can finish all contactless anti-epidemic activities autonomously regardless of place, location, and time.

Source: How to Protect Yourself & Others (U.S. CDC recommendation)
A cutting edge anti-epidemic solution for communal and public facilities

Contactless Care Robot covering all places where social distancing and daily-life quarantine are necessary.

- Temperature checks for facility users and visitors
- Frequent testing by an autonomous mobile robot that detects symptoms and takes immediate actions when anomalies are found
- Manages the hygiene and sanitation of areas that do not have hand sanitizers in place
- Immediately recognizes whether people are wearing face masks and provides voice guidance after discernment
- Activates voice guidance when people are not complying with social distancing rules
- Assesses the appropriate time to ventilate air using temperature, humidity, and air pollution information collected in real-time
- Sterilizers a facility’s surfaces and communal spaces without the risk of creating aerosol by using UVC
- Ability to plan anti-epidemic measures through preset schedules programmed into the LTE/5G-based autonomous mobile robot
- Manages the robot centrally, minimizing the reliance on manual work, and as a result, provides a sustainable way to maintain anti-epidemic measures

SKT’s AI, data, robot, and 5G technology enable its valuable partners to maintain sustainable daily anti-epidemic measures.

**Facility Management**
- Sterilization (UVC sterilizer, hand sanitizer); environment sensor (provides information on temperature, humidity, and air pollution)

**Robot-based quarantine automation**
- Autonomous indoor mobility with route setting, scheduling, and collision avoidance function

**Management of visitors**
- AI based preventive measures (facial recognition, temperature check, discernment of whether people are wearing face masks and practicing social distancing); Information guidance (everyday life quarantine promotional videos and voice messages)

**Centralized Management**
- Remotely manages data collected and generated by the LTE/5G-based autonomous mobile robot on a dashboard

**Data-oriented anti-epidemic measures**
- Supports data-oriented anti-epidemic decision making through a comprehensive analysis using AI-based facial recognition, body temperature data, distribution of non-mask wearers, and data collected by indoor environment sensors
Functions Provided by the Robot

Keemi’s unique functions

AI based Detection
Virus disinfection System
24 hour/day Scheduling
Information Guide
Robot & Telecommunication
Sensor & Data
SK Telecom’s “Vision AI” technology based everyday life quarantine and social distancing

Keemi is a self-driving robot that ensures everyday life quarantine measures, moving around in a facility for 24 hours a day based on a preset schedule, to see if social distancing is being practiced, to assess how clustered the people in the facility are, and to discern whether people are wearing masks. It is able to completely bridge the gaps created by conventional thermometers or temperature measurement kiosks.

Working 24 hours a day, 365 days a year.

- **Facial temperature check**
  - 36.5 ℃
  - Face recognition
  - Facial temperature measurement

- **Mask wearing check**
  - Please wear a mask properly for the safety of everyone.
  - Human face recognition and confirmation of whether the person is wearing a mask with AI technology
  - Facial mask wearing check and voice guidance

- **Social distance check**
  - Please keep your social distance.
  - Recognition of human body and face with AI technology
  - Calculation of distance between persons using a 3D camera
  - Voice guidance for distance non-compliance
  - Voice Guidance: Warning
A smart robot that takes care of spots beyond human reach

SK telecom’s quarantine robot, Keemi, helps staffs and visitors to sanitize their hands wherever you are. It can also thoroughly sterilize every corner of surfaces, which are not reachable by quarantine managers, with UVC.

SK telecom Keemi

- Maximizing exposure to UV with lamps placed in parallel on the left and right sides of the robot for thorough sterilization
- Working effectively in surface sterilization, including ATMs, chairs, exhibition displays, etc. which people frequently touch.
- Sterilizing frequently, based on the predefined schedule, removing viruses, bacteria, fungi, and spores.
- Stopping the sterilization for safety when the robot detects a human
“Epidemic prevention” is the brand power itself in the post-coronavirus age

Visitors are greeted by staff members responsible for anti-epidemic measures and temperature sensors when they first enter a major facility such as a company, a school, a bank or a public institution. In today’s post-coronavirus age, a visitor’s first experience with a facility starts with the anti-epidemic measures in place.

SK telecom’s Keemi provides visitors with an unparalleled user experience based on trust and reliability. In addition, you can leave a deep first impression of the facility on visitors by displaying the company or brand logo.

Day & Night Scheduling

Daytime

- Temperature measurement
- Hand sanitizing
- Please wear a mask properly for the safety of everyone!
- Please keep your social distance!

Nighttime

- UV sterilization
- Contactless Care Robot Keemi
- Contactless Care Robot Keemi
Everyday life Quarantine messenger

SK Telecom’s anti-epidemic robot, Keemi, kindly provides voice guidance for temperature checks, social distancing, and mask wearing. Daily anti-epidemic measure guidelines can be kindly provided to visitors without using too many posters or frequent broadcasts that exhaust visitors’ eyes and ears. Furthermore, key information and public notice can be guided through the 22-inch monitor on the back of the robot.

Robot & Communication Function

Hyperconnected Robot

Keemi : Autonomous mobile robot

SK Telecom’s Keemi supports LTE/5G telecommunication and can operate anywhere. It can effectively perform anti-epidemic measures based on a preset schedule because it is hyperconnected, both indoors and outdoors. The Autonomous Mobile Robot (AMR) module has already been used in the industrial automation line, which is why navigational safety can be assured.

In Autonomous Moving

- Optimal route search and autonomous navigation
- AI-based recognition of surrounding environment and humans
- Self-diagnosis and remote support management (with 5G/LTE application)
Sensor & Data Analysis

Environment sensor and data analysis function

Everyday Life quarantine based on real-time data

Keemi uses its LTE/5G telecommunication function to provide real-time information about its condition, operation and data measured from its sensors. This enables anti-epidemic managers to monitor live everyday life quarantine activities anytime and anywhere through a dashboard that converts the data collected into graphics.

Contactless Care Robot Software

- **Robot Battery**
  - Battery balance display
  - Automatic docking/recharging

- **Map & Scheduling**
  - Route setting and robot location display
  - Quarantine location and work scheduling setting

- **Face & Mask Detection**
  - Face Thermal Detection
  - Facial Mask Detection

- **Indoor Environment Sensing**
  - Temperature, humidity
  - CO2, TVOC (total volatile organic compound)

- **Social Distancing**
  - Body Detection
  - 3D Depth Calculation

- **Communication**
  - LTE/5G Connection
  - VPN Support

- **UV & Hand Sanitizer**
  - Sensing hand sanitizer shortage
  - Controlling UVC sterilization lamp: UVC (Ultraviolet "C" subtype) germicidal lamp setting

Real-time indoor environment monitoring management

The government demands that everyone ensure indoor air properly ventilated with outdoor air frequently. When is the most appropriate time to ventilate air? It is best to ventilate and purify air based on indoor temperature, humidity, atmospheric pressure, acceleration, CO2 level, toxic gas, and indoor dust information. This is why Keemi performs anti-epidemic measures based on real-time indoor environment data using its environment sensors.

Display of CO2 level changes during a certain period of days and hours
Robot Components

Technical Specification

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| **Robot**             | Size: (WxDxH) 500x700x1500mm  
Weight: 160 kg  
Speed: min 0.05 m/s, Max 0.9 m/s |
| **Charging Time**     | With 220V power supply: 4H                                                  |
| **Operating Hours**   | UV-C Mode: 4H (continuous); 8H (general)  
Standby Mode: 10H |
| **Camera**            | Thermal imaging camera: 1EA; visible image camera: IEA  
Facial temperature measurement in mask: measurement up to 10 people; temperature/mask detection range: up to 5M. |
| **UV Sterilizer**     | Surface sterilization with UV-C wavelength (UV lamp output strength X time)  |
| **Environment safety sensor** | Temperature/humidity/atmospheric pressure/acceleration  
CO2, TVOC (volatile organic compound detection) |
| **Hand sterilizer**   | Liquid per spray: 0.7~0.9cc; load of up to 1.8L |
| **Display Monitor**   | Rear: 22” DID Monitor (advertising video; image output, etc.)  
Front: 15” Touch Panel |
| **Camera image processing** | AI-based face/body recognition |
| **Sensor processing** | Sensor signal processing and monitoring |
| **Guidance broadcasting** | User-programmed texts and conditions for broadcasting |
| **Remote monitoring** | Robotic condition monitoring and dashboard |
| **Mobile Robot**      | Mapping setting during first installation on site |
| **Network**           | 5G/LTE/WIFI  
Selective network per telecommunication environment (separate subscription) |
| **A/S**               | Warranty period: One year after purchase  
Care service package: Separate service agreement (including one year for first purchase) |
| **Caution**           | 1) Use of the robot for medical purpose is prohibited.  
2) The specification and design of the robot are subject to partial change before official product launch. |

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