

**TECH OFFER**

## Digital Hygiene Map System For Indoor Space



### KEY INFORMATION

TECHNOLOGY CATEGORY:

**Electronics** - Sensors & Instrumentation

**Infocomm** - Big Data, Data Analytics, Data Mining & Data

Visualisation

**Infocomm** - Video/Image Processing

**Infocomm** - Smart Cities

**Environment, Clean Air & Water** - Sensor, Network,

Monitoring & Quality Control Systems

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174279**

### OVERVIEW

Studies have shown that sharing of indoor space is a major infection risk for Covid-19. Cleaning and disinfection of shared public places such as shopping malls, libraries, etc., has become the frontline in the fight against the virus. While the sharing of indoor space is still inevitable in the post-pandemic state, new tools will be required to help visualize and manage the hygiene level of shared indoor space in the context of Covid-19.

This Technology Offer is a lightweight, browser-based, readily deployable digital hygiene map system for indoor space hygiene management, which can be easily integrated into other related platforms.

The digital hygiene map represents the hygiene level of places as a heatmap overlaid on top of a floorplan. The heatmap is modelled using multiple inputs, for example, human traffic count in spatial and temporal domain, time passed since last cleaning/disinfection, etc.

In this way, the estate manager or cleaning supervisor can have an instant overview of where the potential non-hygienic hotspots are. Cleaners or disinfection robots can be sent to clean up the place in a pre-emptive way.

## TECHNOLOGY FEATURES & SPECIFICATIONS

The digital hygiene map system consists of three major sub-components:

- 1) Artificial Intelligence (AI) and homography backend
- 2) Heatmap model engine and
- 3) Heatmap dashboard user interface (UI) frontend.

The heatmap representation is updated in real-time with real video data feed such as amount of human traffic count in the monitored region, time passed since last cleaning, etc. The system is hosted on a public server and the user can access it via a web browser conveniently.

The system can also be integrated with other building management system (BMS) to enhance the existing estate management services.

## POTENTIAL APPLICATIONS

In many shared public spaces, cleaning/disinfection is either done on a routine basis, or when there is a feedback from tenants/patrons. For example, a shopping mall has a fixed daily cleaning schedule regardless of real human traffic at the time. An estate manager will only send cleaners to clean up a spot when he/she receives a feedback.

Currently, there is no tool that allows the estate manager to visually monitor the hygiene level of building dynamically and subsequently react to a potential hotspot (a place that needs to be cleaned) proactively. Such a cleaning/disinfection practice is passive and does not respond to the real cleaning needs in a building.

In the looming shadow of COVID-19 virus, the cleaning of public places should be no longer a routine-based or event-triggered activity. Instead, an estate manager should carry out these activities in pre-emptive manner, adapt the schedule to real situations and adjust cleaning frequency by differentiating zones with different risk levels.

This Technology Offer is a useful tool for the estate manager to classify/visualize/monitor the hygiene levels of indoor spaces. With this tool, estate managers can make timely and prioritized decision to allocate cleaning/disinfection resources to the high-risk zones.

## BENEFITS

The estate manager is able to get an instant visualisation of the hygiene level of different zones via heatmaps, to see where the high-risk areas are, the trends of human traffic flow, etc.

The cleaning resources can then be optimised and prioritised based on the real hygiene risk situation in the building. Disinfection and cleaning can be done pre-emptively. In this way, the end user of the building space can be assured of a safe, clean environment, which is especially important in this Covid-19 pandemic situation.