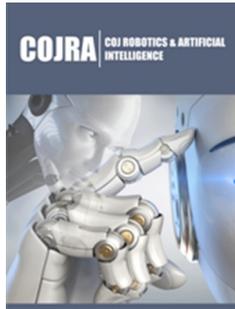


Importance of UV Disinfection Robots for Airports During and After Covid-19: A Short Review

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Jiang Y, Tran TH* and Williams L

Centre of Design Engineering, School of Water, Energy and Environment, Cranfield University, UK

Abstract

COVID-19 has caused havoc in the global aviation industry. Sanitary treatment is a proactive and strategic approach to prevent virus spread in airports. UV disinfection robot is known as a the most efficient method to deal with the issue. This paper reviews various disinfection methods and emphasizes the importance of such robots used in airports during and after the pandemic.

Keywords: Aviation industry; Cleaner airport; COVID-19; Intelligent robot; UV disinfection

Introduction

The COVID-19 pandemic has changed airport's long-term operational process and passenger behaviors, as well as airport sanitation issue [1]. How to deal with virus spread in airports to keep their operations smoothly has received more attention by researchers and practitioners. This paper provides a short review of how airports can disinfect viruses during and after COVID-19. The keywords such as "COVID-19, Coronavirus, Pandemic, Sanitize Airport, Clean Airport, Kill Virus, Ultraviolet (UV), Robot" are used to capture the most relevant literature published over the last three years.

Traditional Airport Sanitation Methods

The COVID-19 virus spreads through infected people, objects, and surroundings in direct, indirect, and airborne ways [2]. Disinfecting object surfaces is an effective way to kill the virus. Both manually and robotically, airports spray a low concentration mixture of bleach and water. Passengers are given personal hygiene items such as alcohol-based hand sanitizers and soap to wash their hands as soon as possible [3]. Droplets from infected people that land on surfaces of objects spread the virus. Airports clean public spaces with wet mops, jets and sprays, and UV-based treatment [4]. In ambience treatment, airports are cleaned using fogging, fumigation, ventilation, and contaminated air filtering.

UV Disinfection Robots for Airport Sanitation

During and after the COVID-19 pandemic, cleaning robots, DNA/RNA testing, and contactless passenger experiences are reshaping the global aviation industry [5,6]. UV light is extremely effective at rendering viruses inactive [7,8]. Although UV can decontaminate COVID-19 viruses, most of the current UV equipment are not designed for airport scenarios and thus have limitations [9]. Heathrow Airport, Hong Kong International Airport, South Florida airport, and Singapore Changi Airport disinfect and clean public space with intelligent UV disinfection robots. Intelligent UV-based cleaning robots can kill viruses and bacteria quickly and efficiently, and even be controlled remotely to clean toilets. Heathrow has installed UV disinfection devices on escalators. A variety of self-cleaning tools are provided for passengers

***Corresponding author:** Tran TH, Centre of Design Engineering, School of Water, Energy and Environment, Cranfield University, UK

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[10]. To combat the spread of viruses, the Hong Kong International Airport has deployed Whiz, a self-driving robot. The intelligent robots integrate an UV disinfection unit and an air disinfection unit. The head of robot can rotate 360 degrees to kill 99.99% of viruses from the air and object surfaces in ten minutes [11]. Disinfectant machines have been installed at Singapore Changi Airport to spray disinfectant on passengers. The disinfectant kills viruses on bodies and clothing while also preventing virus spread caused by passenger movement [12].

Conclusion and Future Work

This paper did a short review for sanitation methods to deal with Covid-19 in the aviation industry. Traditional methods and robot-based methods were reviewed and discussed. The review has identified opportunities and barriers for the airport to disinfect viruses during and after the pandemic. As technology advances, the aviation industry will open a new era of applying more intelligent cleaning robots to reduce the risk of virus transmission. In addition, such intelligent robots could be applied for cleaning aircraft cabin. Then, artificial intelligence should be integrated to deal with complex surfaces in the cabin [13].

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