

Design of UV Based Unicycle Robot to Disinfect Germs and Communicate With Multi-Robot System

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Abstract : In this paper, the communication between a team of robots is used to sanitize an environment with germs is proposed. We introduce capabilities from a team of robots (most likely heterogeneous), a wheeled robot named ROSbot 2.0 that consists of a mounted LiDAR and Kinect sensor, and a modified prototype design of a unicycle-drive Roomba robot called the UV robot. The UV robot consists of ultrasonic sensors to avoid obstacles and is equipped with an ultraviolet light system to disinfect and kill germs, such as bacteria and viruses. In addition, the UV robot is equipped with disinfectant spray to target hidden objects that ultraviolet light is unable to reach. Using the sensors from the ROSbot 2.0, the robot will create a 3-D model of the environment which will be used to factor how the ultraviolet robot will disinfect the environment. Together this proposed system is known as the RME assistive robot device or RME system, which communicates between a navigation robot and a germ disinfecting robot operated by a user. The RME system includes a human-machine interface that allows the user to control certain features of each robot in the RME assistive robot device. This method allows the cleaning process to be done at a more rapid and efficient pace as the UV robot disinfects areas just by moving around in the environment while using the ultraviolet light system to kills germs. The RME system can be used in many applications including, public offices, stores, airports, hospitals, and schools. The RME system will be beneficial even after the COVID-19 pandemic. The Kennesaw State University will continue the research in the field of robotics, engineering, and technology and play its role to serve humanity.

Keywords : multi robot system, assistive robots, COVID-19 pandemic, ultraviolet technology

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