

New - EIR Germicidal UV-C.

Development of Enhanced Indoor Air Quality Monitoring and Sanitation.



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PROBLEM STATEMENT

Airflow in public areas can quickly spread infectious airborne diseases, compromising the health and safety of the occupants (Fig. 1).

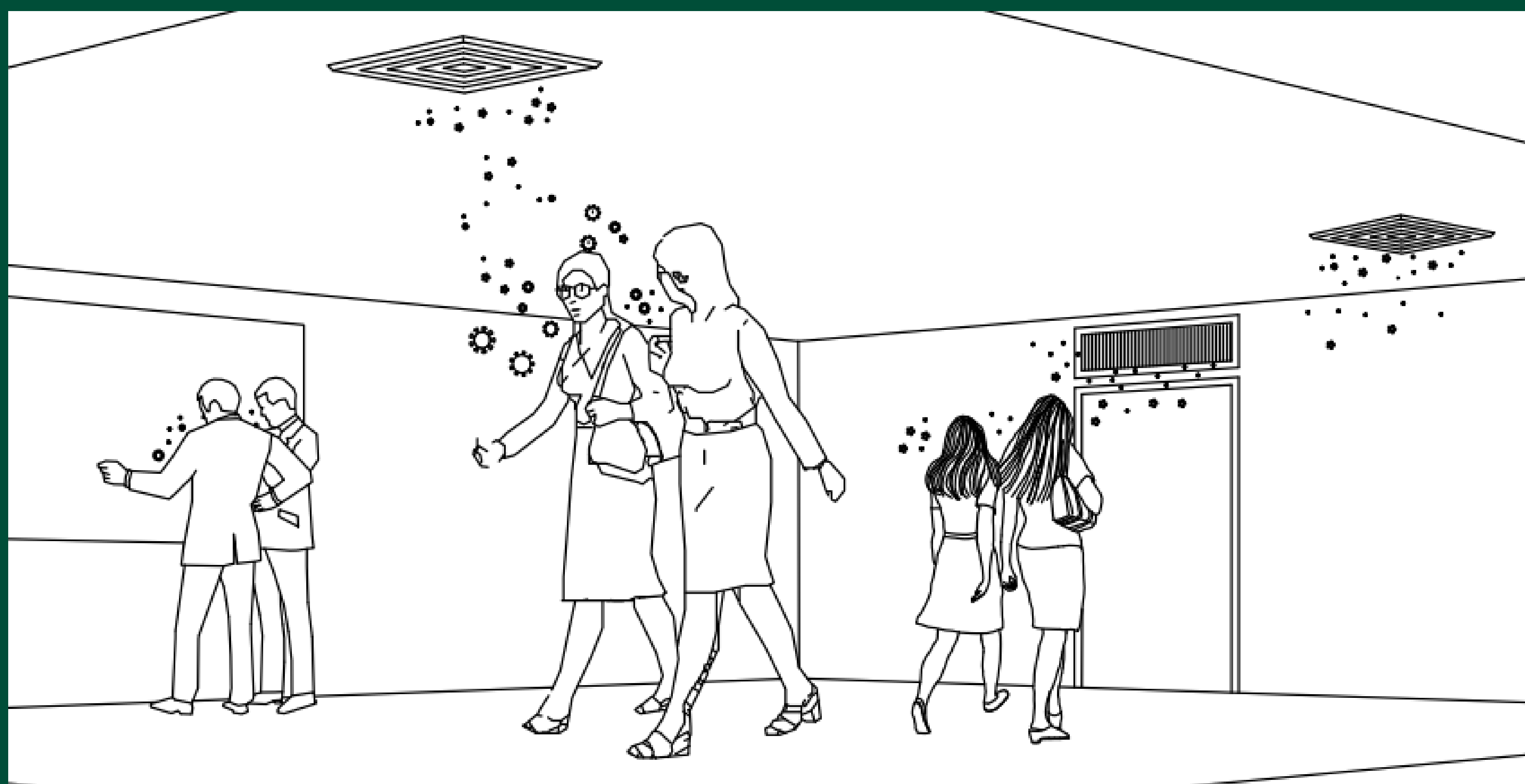


Figure 1: Airborne diseases like Coronavirus and Influenza can be spread via contaminated indoor air, circulated by unsanitized air conditioning

BACKGROUND

HVAC systems can become breeding grounds for bacteria, viruses, and dangerous molds which can be circulated through the building's air ducts. UV-C radiation kills and deactivates germs and viruses by damaging molecules like nucleic acids and proteins, preventing them from infecting humans. By including this UV disinfection in existing heating and air systems, we can reduce the spread of dangerous pathogens within a building and maintain a safe environment for all its occupants.

SUMMARY OF WORK

We have created a safely enclosed air sanitizer that can be installed in existing HVAC systems. It uses UV light (Fig. 2) to eliminate microbes before they recirculate into an occupied space. We designed it with air quality sensors to monitor and report effectiveness (Fig. 3). The user can view these air quality readings using an Android App.

We will be improving the design for installation, building housing for an outdoor sensor, and incorporating solar panels with back-up battery. The user will be able to control the power of the device remotely.

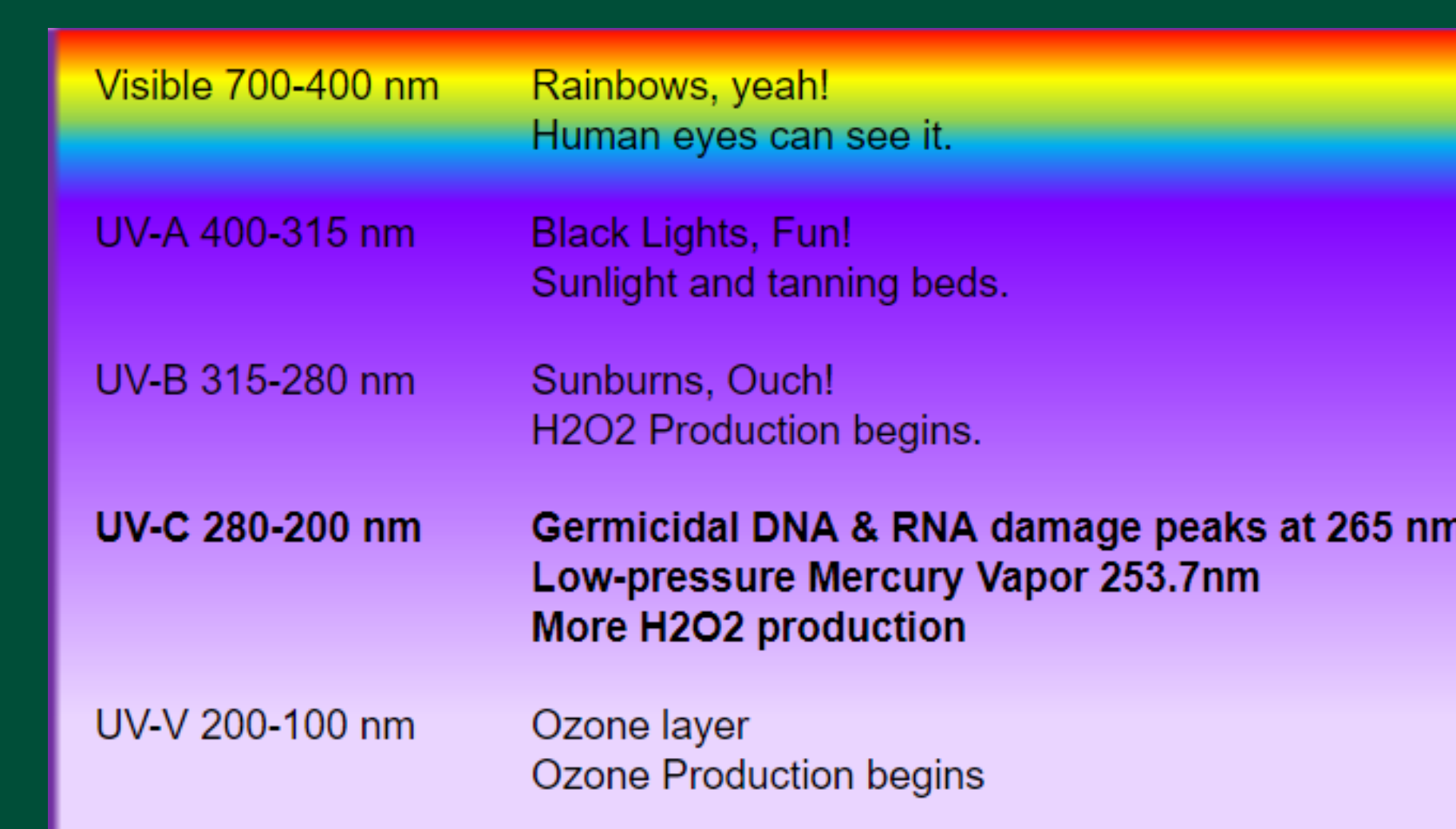


Figure 2: UV spectrum explained

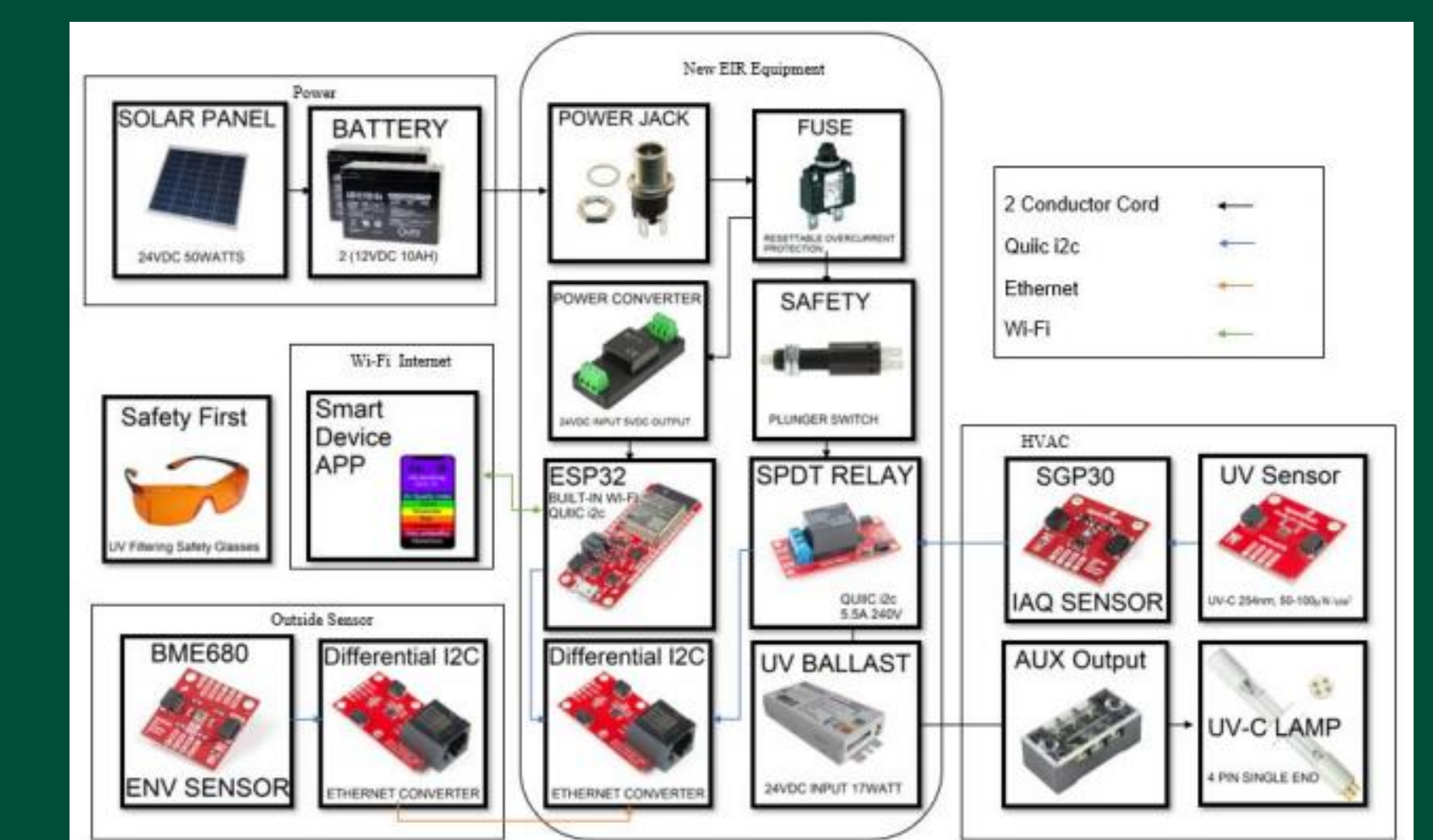


Figure 3: Sensor block diagram

IMPACT ON COMMUNITY

This design is an effective and affordable way to reduce the spread of dangerous pathogens, like coronavirus, within businesses and public buildings. It can also reduce odor and prolong the life of an existing HVAC system.

- Restaurants, Shopping Centers, Hair and Nail Salons
- Schools, Churches, Theaters and Community Centers
- Locker Rooms, Fitness and Athletic Centers
- Hotels, Dormitories and Offices