The Covid-19 pandemic took the world by storm and highlighted issues with current supply chains at home and around the globe. Healthcare and other facilities started to reuse and sterilize personal protective equipment such as N95 masks. The techniques used were inefficient, costly, and degrade the material. The need for new decontamination methods were clear.

**PROBLEM STATEMENT**
Engineer a novel decontamination unit that implements UVC lights, Blue light LEDs, and an electrostatic field while still being portable and straightforward for use by the general population.

**METHODOLOGY**
An initial decontamination unit based on a patent from the client was provided to the team. The unit contained working UVC and Blue light LED systems. The main goal was to implement an electrostatic field.

The design was created with safety and effectiveness in mind. The top of the unit was charged to 10 KV while the four sides and the bottom of the unit were grounded. This is what enables an electrostatic field for run within the unit. Locks were placed on the lid to ensure that the unit could not run while open. Additionally, a switch was placed on the exterior of the unit in order to transition between the UVC/Blue light system and the electrostatic field.

**DISCUSSION**
Challenges related to methods for measuring electrostatic charge were solved utilizing a Vernier Go Direct Static Charge Device. Issues relating to filter efficiency testing and wireless internet sources interfering with the sensor’s signal were also solved. Lastly, shortcomings related to shadowing were solved with a creative shelf design.

**CONCLUSIONS**
An effective decontamination unit with UVC and blue light LEDs and an electrostatic field was engineered by the team. The unit may be produced commercially or serve as the basis for further research by DOD or other customers. Future steps would be to outsource live pathogen testing.

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