1.0 Micron Technology's UV-Robotic Design Challenge:

1.1 Background

1.1.1 Micron Technology Inc. is seeking design proposals from multi-disciplinary research groups to help provide readily available and cost-effective solutions to help fight against the transmission of viruses, including the one causing COVID-19. Many groups across the globe have come together to help society navigate through unprecedented times and often university researchers and students are at the core of these ideas and developments. This project is no different. We are reaching out to the brightest minds to help turn ideas into reality and create a safe path forward in combating the current pandemic. This project aims to create an open sourced UV design that allows for widespread use and application, and Micron encourages university teams and research groups to leverage their skill and expertise, to design an effective UV-robotic solution in support of local and global communities, organizations and corporations.

1.2 The Micron Challenge

1.2.1 Micron is challenging leading university research groups and health science programs to participate in the UV-Robotic Design Challenge to address the growing need for accessible, reliable, and low-cost solutions to help mitigate the transmission of viruses, bacteria, and spores which remain active on surfaces for prolonged periods of time. Today's global health crisis is necessitating innovation and scientific advancement in all segments of society. In response, Micron, in partnership with the Micron Foundation, launched a $35M dollar giving campaign: https://investors.micron.com/news-releases/news-release-details/micron-dedicates-35-million-support-global-communities-and. Part of this campaign is tied to supporting innovation within partnering universities and providing them with learning opportunities.

1.2.2 This challenge will push students to expand their knowledge base, work under tight timelines, and create a design concept that balances safety and cost. We invite each participant to consult with experts, expand the team to include non-technical subject matter experts, and create an environment and mentality of "providing solutions for the greater good of society."

1.2.3 Due to the global health crisis, the duration and turnaround of this challenge is quite demanding. Accepting the call to action requires a multidisciplined team

that collaborates effectively in order to drive a design to completion within a specified timeframe. Teams are urged to include members from (but not be limited to) Mechanical, Robotic, Software, Electrical, and Biomedical Engineering disciplines. Micron values diversity and inclusion and encourages this to be present within teams.

1.2.4 Participating universities with be given a single onetime $10,000 gift per the attached Micron Gift Agreement.

1.3 How to Join the Design Challenge:

1.3.1 Participating universities and research institutes must submit the following information by May 29, 2020 to be considered for acceptance:

1.3.1.1 A signed Micron Gift Agreement by university authorized representatives

1.3.1.2 Identify a faculty lead who will help form and manage the university team comprised of students from various disciplines

1.3.1.3 Identify a student team leader who will serve as the main point of contact

1.3.1.4 Contact information and short biographies for all team members

1.3.1.5 A commitment to deliver a design on the open source platform www.ohwr.org by July 31, 2020

1.3.2 In addition to the technical merit of the design the teams will be evaluated according to the following criteria:

1.3.2.1 **Innovation**: The design addresses the challenge in unique, innovative, and efficient ways.

1.3.2.2 **Impact**: The design can be turned into real-world applications that generate improvements in rapid and impactful ways.

1.3.2.3 **Collaboration and Leverage**: The design can be used by or benefit multiple researchers or advocates, fostering further innovation. Methodologies and/or contributions to a framework can be easily shared and adopted, even improved upon globally.

1.3.2.4 **Inspiration:** What opportunities may arise from the emerging technologies and how will they help the next generation of visionaries?

1.3.2.5 **Robotic Outcome:** The project outlines clear advantages of robotic technologies and addresses the risks associated with the advancement, adoption, and integration of robotics.

1.3.2.6 **Achievability:** The design identifies obstacles in prototyping and anticipates reasonable approaches in overcoming them. It does not overlook significant barriers or rely upon uncontrollable external factors in the sourcing or integration of components.

1.3.3 For further information or to accept the Micron Design Challenge please contact Janine Rush-Byers (jrushbyers@micron.com).

1.4 Timeline

Task	Due Date
University Application Deadline	05-29-2020
Acceptance Notification	06-03-2020
Progress Report from University (email)	06-10-2020
Gift Payment Initiated	06-12-2020
Micron Mentor Team Check-In (video meeting)	06-17-2020 06-19-2020
Progress Report from University	06-25-2020
Micron Mentor Team Check-In (video meeting)	07-01-2020 07-03-2020
Progress Report from University	07-09-2020
Micron Mentor Team Check-In (video meeting)	07-15-2020 07-17-2020
Progress Report from University	07-23-2020
Open Source Design Submission	07-31-2020
Team Design Presentation	08-03-2020 08-07-2020
Micron Committee Review	08-10-2020 08-14-2020
Micron Team Feedback	08-17-2020 08-21-2020

1.5 Concept of Design

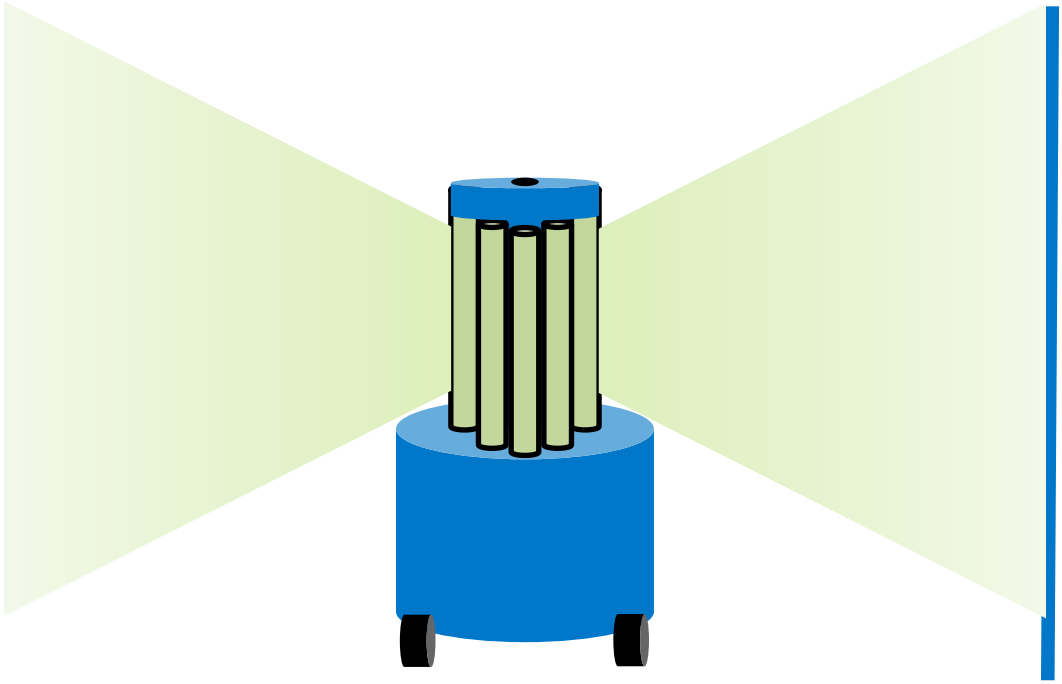
1.5.1 Ultraviolet light destroys the genetic material in pathogens—DNA in bacteria and fungi, RNA in viruses—preventing them from reproducing. The primary function of the UV- robot will be to disinfect rooms using ultraviolet germicidal irradiation for use at various businesses and organizations unexclusive of any industry or setting outside the medical field.

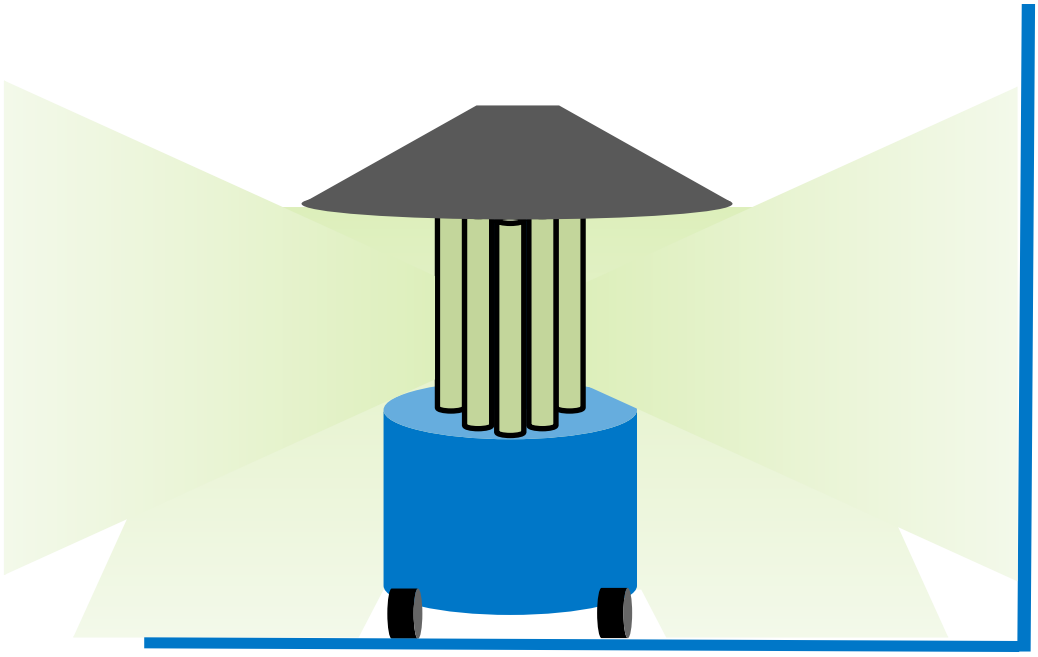
1.5.2 Once the robot is manually energized by the operator, the system must activate the UV lamps/LEDs remotely. The system will operate only when the area being disinfected is fully vacated (no living beings are present) and will be interlocked by the motion safety feature if movement is detected. The robot will sanitize all surrounding surfaces, including the floor.

1.5.3 After each area within a room is sanitized, the robot must be able to move to the next area. Distance sensors (i.e. laser, IR LED, ultrasonic, LIDAR, etc.) must monitor the environment to prevent human exposure, robot collision, and damage. After the robot has finished sanitizing a room, it will notify the operator that the job is complete and then shut itself down.

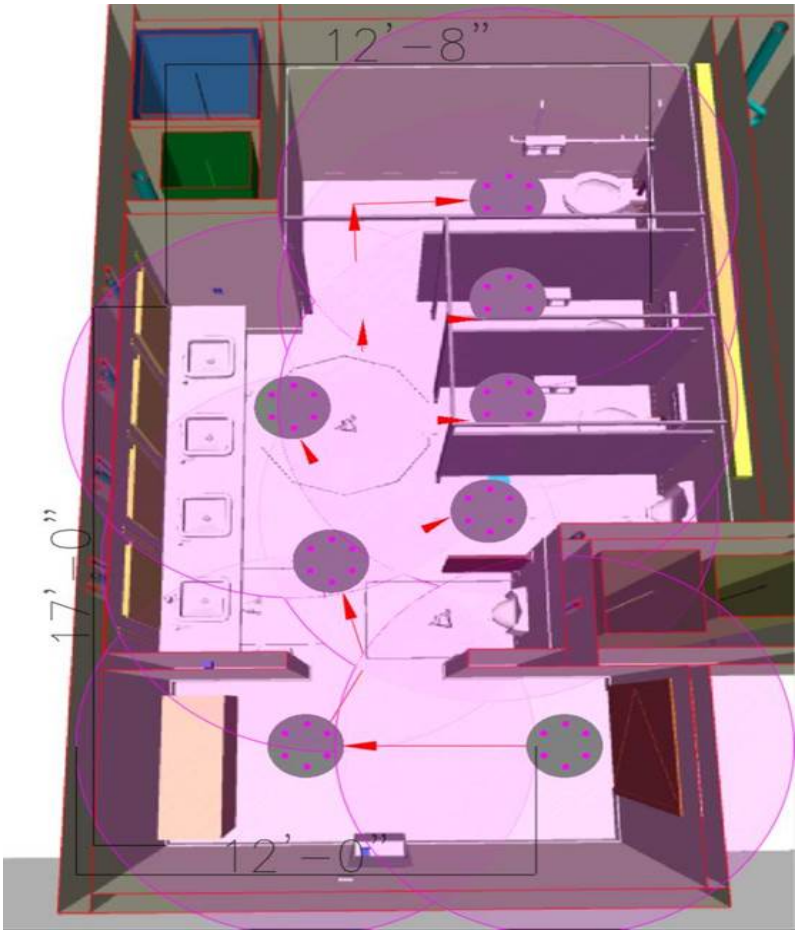
1.5.4 The ability to monitor, measure, and track individual performance of each sanitation will need to be available for historical tracking.

1.5.5 Example Robots:

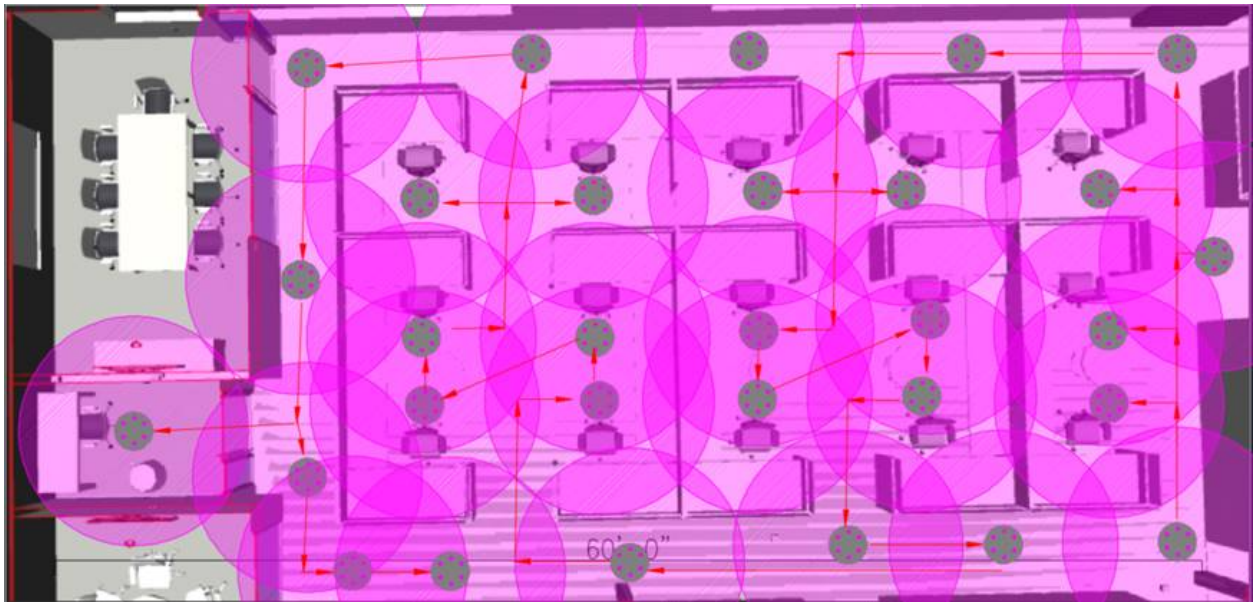




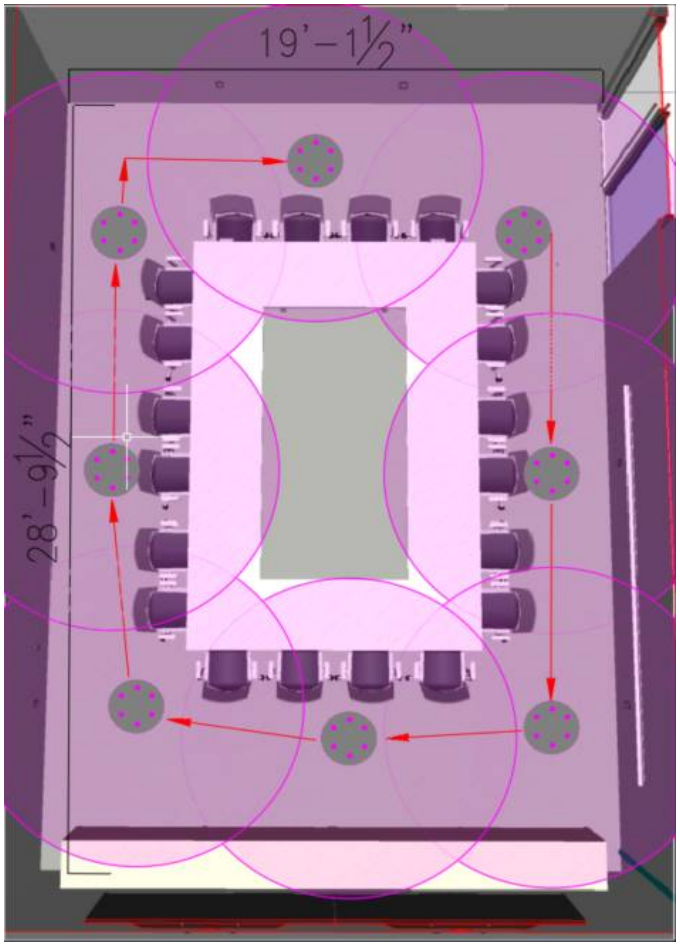
1.5.6 Example Bathroom:



1.5.7 Example Workspace:



1.5.8 Example Classroom/Meeting Room:



2.0 Design Project Deliverables (due at end of challenge):

2.1 Upload UV-Robot Design to the Open Source Platform www.ohwr.org with the Following Information:

2.1.1 Written concept-of-operations regarding how the robot functions, the sequence of operation, the functional parameters, and the operating system.

2.1.2 Design Requirements Document, see example provided in 3.2

2.1.2.1 Supply supporting calculations for validation

2.1.3 Upload visual illustrations

2.1.3.1 File type options: PDF, GIF, JPEG, PNG.

2.1.3.2 The visual illustration(s) should complement an entry description and can include drawings, photos, charts, or CAD images. A 3D-model is preferred in Solid Works, Solid Edge, Inventor or similar 3D-software.

2.2 Team Presentation to Micron

3.0 References:

3.1 Micron Gift Agreement - UV Robot Design Project

3.2 UV Robot Checklist & Design Requirements Document

3.3 Ultraviolet Radiation TLV 2010

3.4 UVC Dose Calculator

