UV-C Lamp Position Optimization for Smart-UVC room disinfection

Project Management and Software Development for Medical Applications

General Info
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Project Abstract
Creating a software/script for optimizing the position for UVC lamps within the Smart UVC project.

Background and Motivation
The main aim of Smart-UVC project is to create a unique corpus of hardware and software for intelligent room cleaning, which is an unmet need for the indoor environments with high risk of germ exposure (e.g., hospitals, OP rooms) such as corona viruses or multidrug-resistant bacteria. Using a scanning software [1] and Lidar cameras [2] an initial point cloud of room can be obtained. This point cloud can be transformed into a mesh. Using a blender baking [3], the amount of light emitted to the surface can be then computed.

Student’s Tasks Description
The student’s task would be to design and code a tool for computing the optimal lamp position in the room for fast disinfection. The optimization of the number of lamps per room is also part of the project. A first step in this process (1-2 weeks) is getting familiar with the topic, types of data used and optimization algorithms. In the next stage, student will brainstorm with the supervisors functionality and will proceed with the coding part.

Technical Prerequisites
Student should have experience Python, basics of Computer Vision and is willing to explore optimization algorithms.

References
1. Dot3D software
https://www.dotproduct3d.com/meshlab.html
2. Intel Realsense L515
https://www.intelrealsense.com/lidar-camera-l515/