Automated Energy-Saving Cleaning Systems for Central Heating and Ventilation: Healthy Air for Hospitals and Offices

Shepstone, Michael (School: Somerset College)

The purpose of this project is to provide an automated system that can perform the simple, easy and cost-effective cleaning of HVAC (Heating, Ventilation and Air Conditioning) heat exchanger fins. When these fins are dirty, they can effectively double the energy requirements of the HVAC system. They act as a breeding ground for bacteria, viruses and other microorganisms, causing higher rates of airborne disease transmission. Three prototypes were designed, and two were built. Each prototype aimed to have more advantages and fewer disadvantages than its predecessor. The system was successfully constructed using a design similar to that of a laser cutter. The two axes of freedom allowed the system to successfully deploy the cleaning liquid/foam to the radiator fins. This allowed the radiator fins to be successfully cleaned by the mixture. The engineering and design goals were met by the cleaning robot. The results indicate that this task is possible to automate with the current system.