Robot Design: Theory, Practice, Philosophy

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Final Project   Asbestos, a toxic material of high public health concern, is widely used as building material in plentiful developing countries. Every year, over 107,000 people die in the world from exposure to this chemical substance. Our robot design thereby aims for testing Asbestos level effectively in the indoor environment. It is mobile with the aid of wheels. Equipped with an on-site Asbestos sensor, three LED lights and a buzzer, the robot will move in a straight line and stop for Asbestos testing every 5 metres. The lights and buzzer will turn on according to the level of Asbestos. The robot is also capable to sense temporary obstacle and will move in reverse direction back to the starting point when it faces some permanent obstacle like a wall. When it is powered off, the recorded results will be save in a csv file for further examination.

Research Remarks   Traditionally, the Asbestos is tested by taking a sample for X-ray laboratory analysis. 3 years ago a model of real time on-site Asbestos sensor is developed under the EU funding. It is based on a decade-old idea of how Asbestos fibre scatter light compared to other materials. First shining a laser beam at a stream of airborne particles. When light bounces off the particles, it scatters to form unique, complex patterns. After identifying the fibers, the detector carries them in an airflow through a magnetic field and uses light scattering again on the other side to tell if the fibres have aligned with the field.