

Automated Smart Medical Waste Segregation

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Working procedure

Type of waste	Inductive sensor	Capacitive sensor	Ultrasonic sensor
Metal	yes	yes	yes
Plastic	no	no	yes
Wet waste	no	yes	yes

We use a combination of inductive, capacitive and ultrasonic sensor to detect the presence as well as the nature of waste, Finally we used two servo motors to segregate the waste.

We have also set up a system to send notification when the waste boxes will be full.

Detection accuracy: 90 percent
Segregation accuracy: 80 percent



Novelty



Very low installation cost (around 12,000)

Instead of importing, sourcing local materials and using available components, we were able to reduce the cost.

Use of biodegradable or recyclable materials (Plywood, PLA, metal shaft etc)

PLA is a biodegradable plastic. We have currently used PVC pipe in our project which can be later made from PLA using moulds for bulk produce once commercialized.

Push Notification system

We have also implemented a system to send information to concerned authority via phone when the waste boxes need replacement.

Future scopes and scalability



- Improvement in waste sortation with object detection algorithm
- Using Choetsu for waterproof coating which is completely biodegradable
- Using Rechargeable Battery for power supply to reduce waste
- Increasing the categories of waste to segregate hence improve waste handling
- Using bulk produce from moulds instead of 3d printed and pvc parts
- Expanding it to be used as central waste collection and segregation system

Quotes from Experts



Dr. Manifa Afrin

Associate professor cc
Universal Medical
College and Hospital

“Biomedical Waste Disposal is an essential commitment to providing our patients with a safe and hygienic healthcare experience. And that will only be effective by filtering out hazardous elements and taking proper safety measure to handle so“

Dr. Ching Key Prue

Medical Intern
Armed Forces Medical
College and Hospital

“Incinerating different materials may produce different toxins, specially for metal. Again, reusable plastics also need to be segregated for sterilization in hot air oven, Sterilizing it along with metals may cause shrinkage or tempering of the equipment”

Dr. Radwana Noor

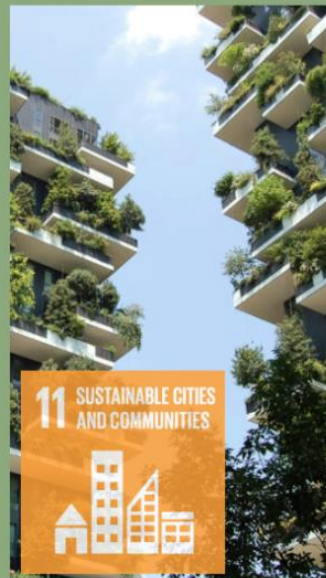
Medical Officer
Shaheed Suhrawardy
Medical College and Hospital

“Such a system can be useful for implementing in places with high crowd where there is no effective segregation system yet the amount of waste disposal is huge”

Cost Analysis

ITEM	COST	ITEM	COST
Inductive sensor	630	Arduino	600
Capacitive sensor	700	Battery	300
Ultrasonic sensor	350	3d printed parts	300
Servo motor	300	Wooden chassis	7000
Metal Shaft	1000	Pvc pipe	200
Bluetooth module	350	Miscellaneous	1000
Total cost		12830	

Target SDG goals





Thanks!

Any Questions?