

## Triple R: Litter Cleaning Robot

### Abstract

Our goal is to make the planet a cleaner place to live in. We plan to accomplish this goal by cleaning up litter. Highway litter is made up of 59% paper, 16% cans, 6% bottles, 6% plastic and 13% unknown garbage. This is terrible, we need to stop it. I'm sure everybody has seen someone throw some kind of trash out their car window even it's something small like a piece of gum or a cigarette butt. To help clean up the planet, we have thought of the idea of a garbage cleaning up robot. This robot will automatically pick up trash and litter including cigarette butts that take up 35% of all litter! We have this very important goal and we plan to change the world and get everybody to help. We need to make sure Earth doesn't turn from the blue planet into the dump of the universe!

# Triple -R

## Current Technology-

The current technology of robots is the DustBot, iRobot products, GPS and Solar power. The DustBot is a garbage cleaning up robot that responds to telephone calls and goes to people's houses to collect trash. The DustBot is told what kind of trash it is and then takes it to the correct place to dispose of it. This was a good idea and a lot of new technology was featured in it. This technology includes a sensor so it will not bump into anything, GPS, and a way to respond to telephone calls.

The iRobot products are robots that also pick up trash around the house! It's a vacuum cleaner. It has cliff-sensing technology to identify when there is a wall, stairs, or ledge that it may bump into or fall off of. As a result, it will not get too close to the wall, stairs, or ledges.

A GPS, global position sensor has been an important invention for people and robots too. It can tell someone where they are and where give directions for where they want to go.

Finally, the solar panels harness the energy of the sun and turn it into power. They have been used in many items including solar powered calculators and solar farms. These devices can help to power one device or generate electrical power for many homes. This has been a very important invention that will hopefully be modified for more human uses as time goes on.

## History-

The first robot was invented between 77 B.C - 100 B.C. It was made up of gears and calculated the moon, sun, and celestial positions. In 1495 Leonardo de Vinci created the first human like robot. It could move its arms, head, and mouth. It was created because Leonardo de Vinci wanted to prove that he could imitate a human beings body. In 1865 the first steam powered robot was created. It was designed to pull people in carts. This helped people get to places faster.

In 1912 the word robot was coined. It came from the Czech word "robota" which means "compulsory laborer." In 1936 Alan Turning introduces a theoretical computer called the Turing machine. In 2000 Honda made a new humanoid robot named ASIMO. ASIMO was created to do what humans do and, could help do what humans can't.

In February 2010 the Dustbot was made to go and pick up trash. It was a very convenient way for people to get rid of trash. Right now

there are International groups of professionals that are developing robots by sharing ideas and developing new robots as a joint venture.

And in 2020 the Triple R robot is made to save the environment from litter and pollution.

## Future Technology-

Our project is a garbage cleaning robot called the TripleR. The TripleR is designed to pick up garbage from highways, railroad tracks, streets, etc. Our robot is environmentally friendly since it runs on natural resources, such as solar power. It has several sensors to help it navigate and it also has a GPS. The robot runs on wheels and has a vacuum on the bottom of it. It is equipped with a device to separate litter that is recyclable from litter that is not. It has a trash compactor in its interior and can hold up to 70 pounds of trash.

A person could also give the TripleR a phone call for it to clean up their street. The TripleR will verify the caller ID and come to their street to remove the litter. It will have pressure sensors along the bottom so if it's about to pick up or run over something unsafe, it will automatically stop. Our robot can help reduce many problems that arise with litter such as animals choking when they mistake litter for food. It will also

make streets cleaner and smell better. We hope that the TripleR will help inspire people to help the environment.

## Breakthroughs

Some breakthroughs are necessary to make Triple R a reality. One is the production of a large, automatic, self-operating, robot that can be produced in large enough quantities so it can be purchased or rented. Currently such robots would require a lot of time to create in large quantities which makes them expensive. The product would cost a lot of money. It would be difficult for people to buy or rent it.

A sensor for Triple R needs to be developed that can separate different types of garbage that can be recycled (ex. Metals, plastics, etc.) from dangerous materials and chemicals (ex. Needles, poison, drugs, etc.). This technology isn't here today because it takes a long time and costs a lot of money to separate different types of materials. Also, a solar powered trash compactor needs to be invented because the Triple R will compress garbage so that it takes up less room. There is also no cheap and efficient way yet for making something tough and durable, like a robot, out of recycled garbage.



## Design Process-

We started out pitching ideas. Only a few stuck out to us, though. We liked the garbage cleaning up robot. That is where the TripleR came from. We originally named the TripleR the LitterBot. That name was later changed. We were researching litter, robots and any possible thing that could be included in our project when we found out that a garbage cleaning up robot was already invented. We also realized that the TripleR in our mind was very different from the DustBot, the robot that picks up trash that was already invented. We wanted our robot to pick up trash automatically. The DustBot didn't do that. We also found that there was another robot that picked up litter in your house automatically! An iRobot vacuum! When we found this, we definitely wanted to use it in our project! Now our robot was very different from the DustBot and we had come a long way from the beginning!

## Consequences

There will be consequences with our design. Some positive consequences are that there will be less litter polluting the streets and landfill waste will be reduced dramatically. There will be less garbage clogging up the streets, which leads to less sick animals from their encounters with litter. Litter can leak into bodies of water, so the TripleR will reduce the amount of marine animals getting hurt. Bacterial and disease-carrying organisms thrive in garbage, and the removal of garbage will prevent those diseases from spreading to humans.

Of course as with any design, our robot will have many negative consequences. One of them is the cost that comes with building such a complex robot. The robot may also pick up materials that are desirable in error, as well as get in the way of people and cars. Having a robot pick up trash may also make people feel less guilty about littering, so they would litter everywhere.

“Solar Energy.” Cartoon. *BrainPOP*. FWD Media Inc., 2011. Web. 14

Jan. 2011. <<http://www.brainpop.com/>>.

*www.dustbot.org*. Scuola Superiore Sant’Anna, n.d. Web. 13 Jan. 2011.

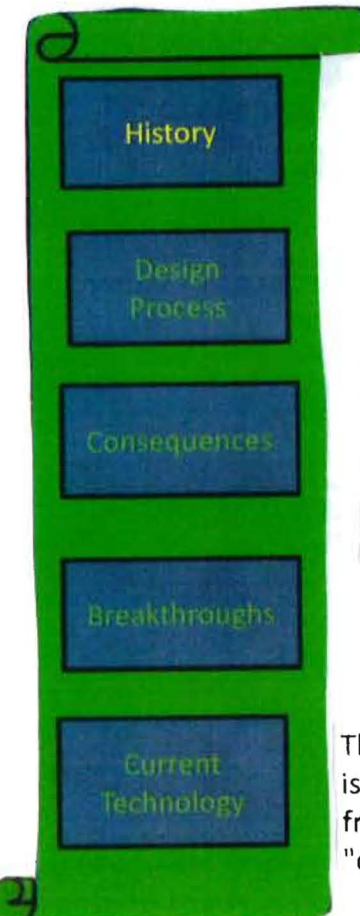
<<http://www.dustbot.org>>.

*www.irobot.com*. iRobot Corporation, n.d. Web. 13 Jan. 2011.


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## History



**77-100 B.C.-**  
The first robot was made. Mostly made of gears this device calculated the sun, moon and celestial positions.




**1495-**  
Leonardo da Vinci made the first human like- moving robot. It could wave, turn its head and open and close its jaw.




**1865-**  
The first steam powered robot was created to pull carts with people in them **1936**  
Alan Turning introduces the concept a theoretical computer called the Turning Machine. Despite being a fundamental advance in computer logic it also spawns new schools in Mathematics

**robot**


**1912-**  
The word "robot" was created this is why, "Robot" in Czech comes from the word "robota", meaning "compulsory labor"



**2000-**  
Honda debuts new humanoid robot ASIMO



**2010**  
In February 2010 the DustBot was created. It goes to pick up trash at other people's houses.



**2020**  
*The Triple R robot is made.*

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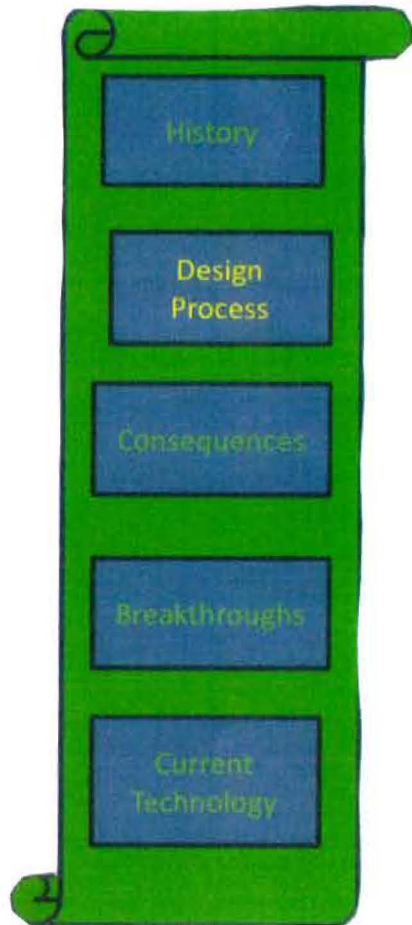
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## Design Process



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Front



back



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## Future Technology

History

Design  
Process

Future  
Technology

Breakthroughs

Current  
Technology

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## Breakthroughs

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History

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Process

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## Current Technology

History

Design  
Process

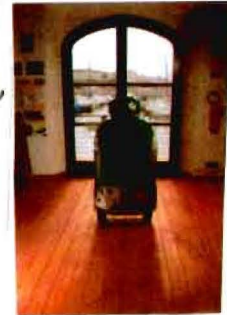
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DustBot



iRobot



GPS



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