

SMART TRASH CANS

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Smart kitchen aids, smart power tools, smart home appliances,
smart security system, etc.



SMART TRASH CANS

- Outline
- Current Trashcans
- Capacitance Sensors
- Capacitance based Trashcan
- Bill of materials for capacitance based trashcan
- Photoresistor and R_Ctime
- Photoresistor and R_Ctime based trashcan
- Bill of materials for Photoresistor and R_Ctime based trashcan
- Conclusions & Futureworks



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http://www.sciencedaily.com/videos/2006/1001-smart_trash_cans.htm

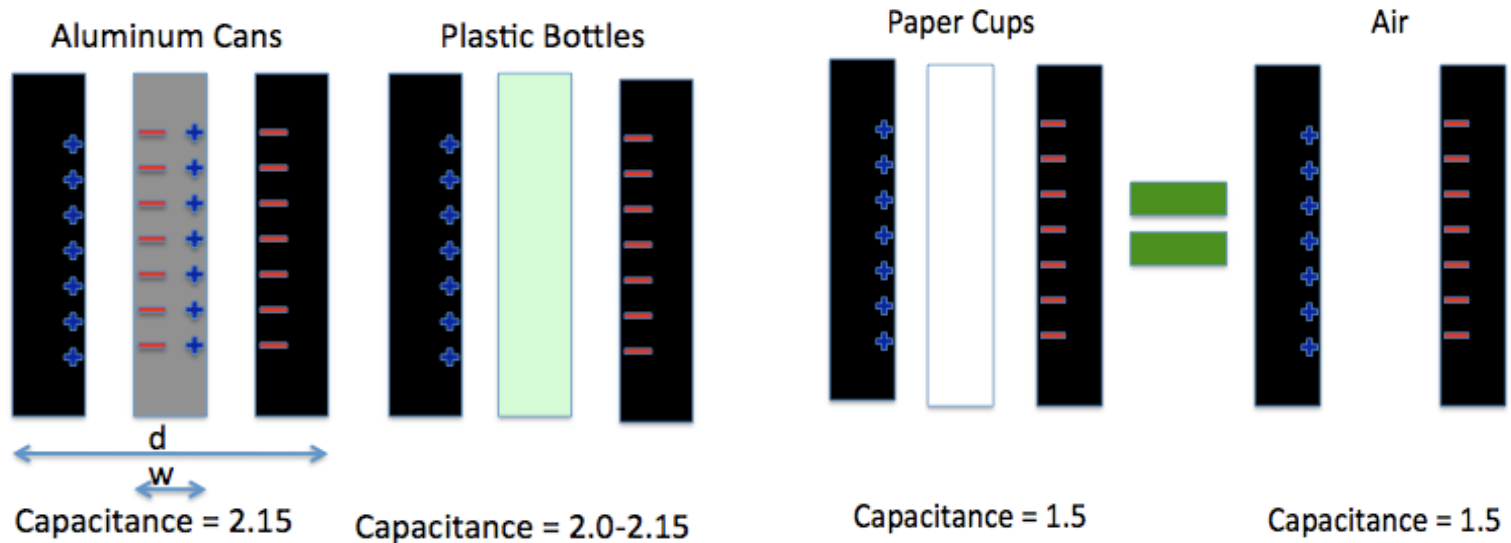
Smart Trash Cans RFID-Based Recycling Technology Makes Philadelphia Greener

http://www.sciencedaily.com/videos/2007/1002-recycling_without_sorting.htm

Recycling Without Sorting Engineers Create Recycling Plant That Removes The Need To Sort



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$$C = \frac{Q}{V}, \quad C = \frac{dQ}{dV}$$

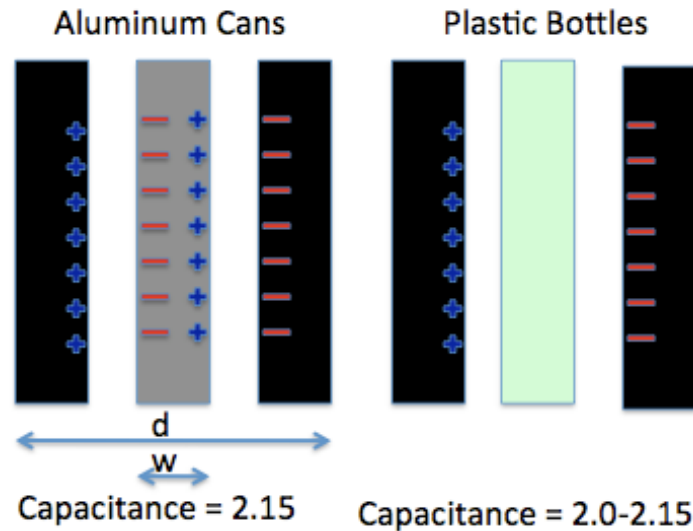
$$C = \frac{\epsilon_0 \epsilon_r A}{d}$$

$$C = \frac{\epsilon_0 \epsilon_r A}{w-d}$$

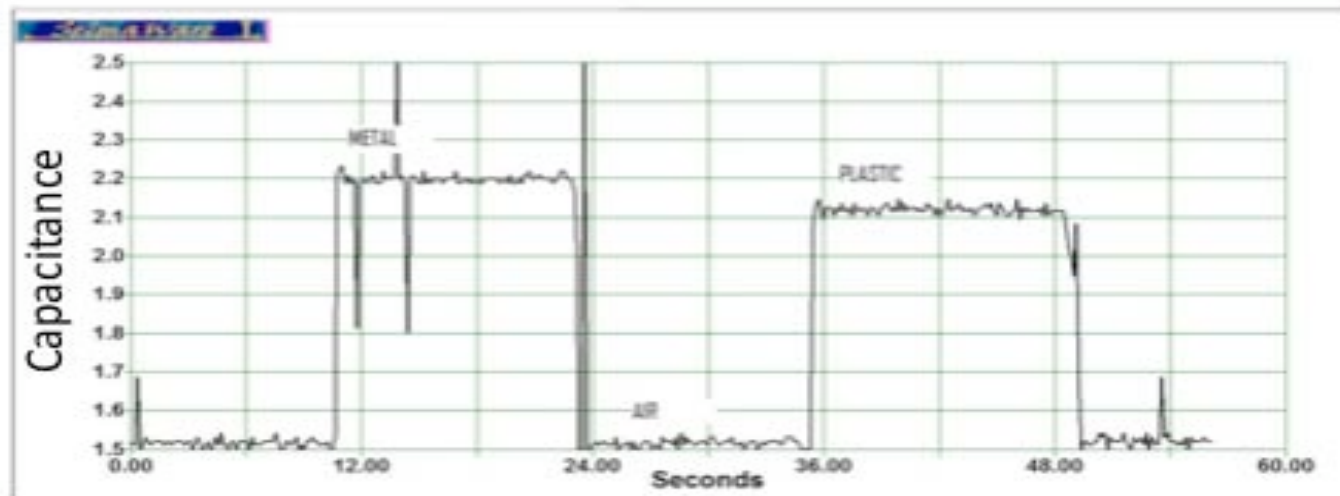
Equation 1

Equation 2

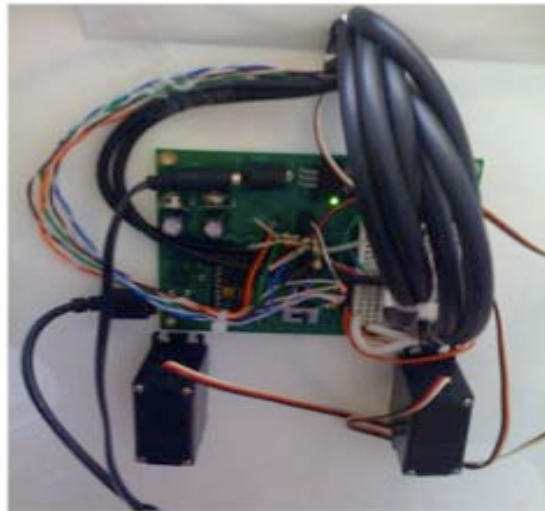
Equation 3



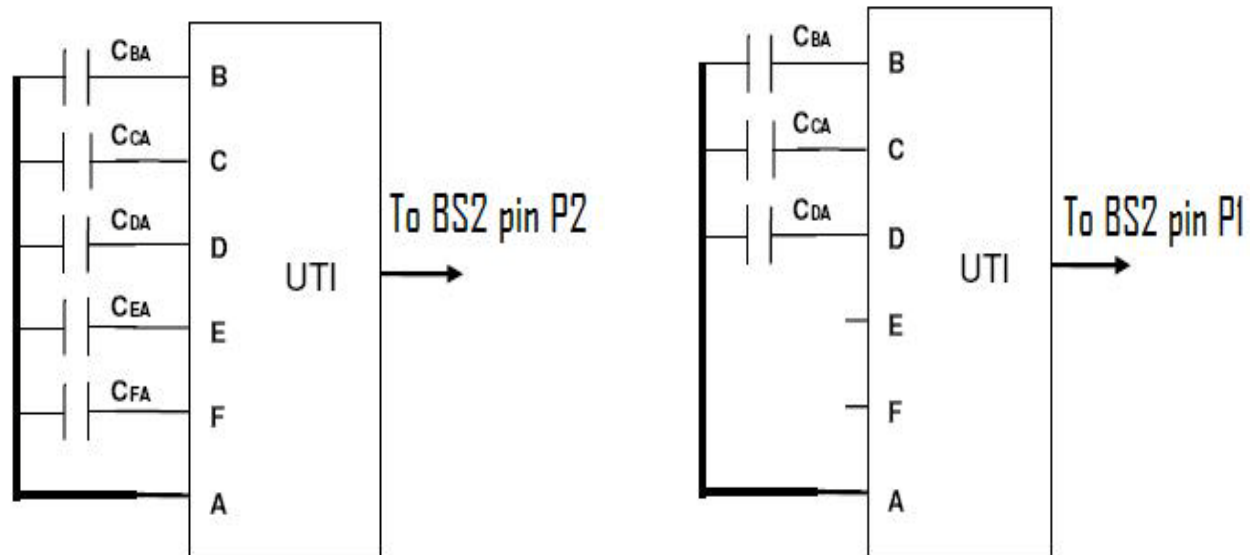
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Bin 1 = Plastic

Bin 2 = Paper

Bin 3 = Aluminum



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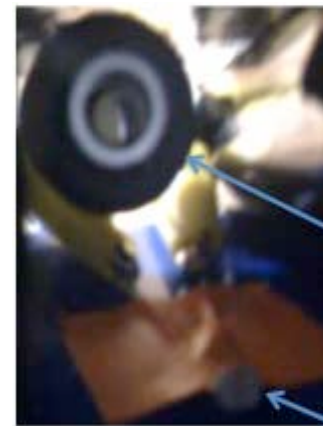
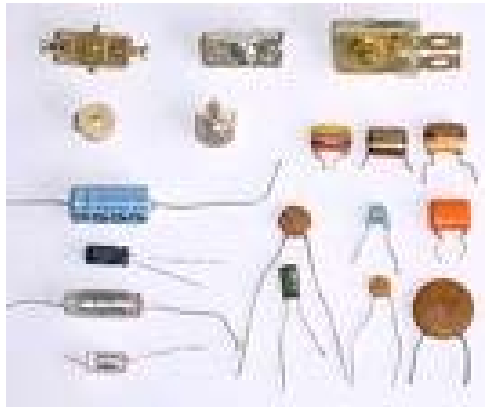
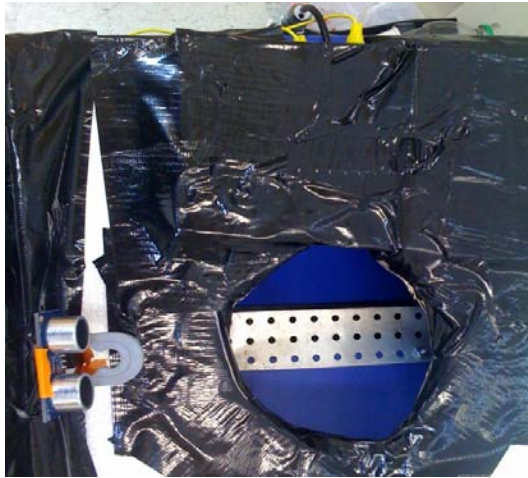


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Bill of Materials/Capacitance

- **BS2 \$240**
- **Cables \$ 2.00**
- **Labor \$200**
- **Trash Can \$ 30.00**
- **Label Maker \$ 25.00**
- **White Cardboard \$ 15.00**
- **Trash \$ 8.00**
- **Capacitance plates \$ 10.00**
- **Tape \$ 15.00**

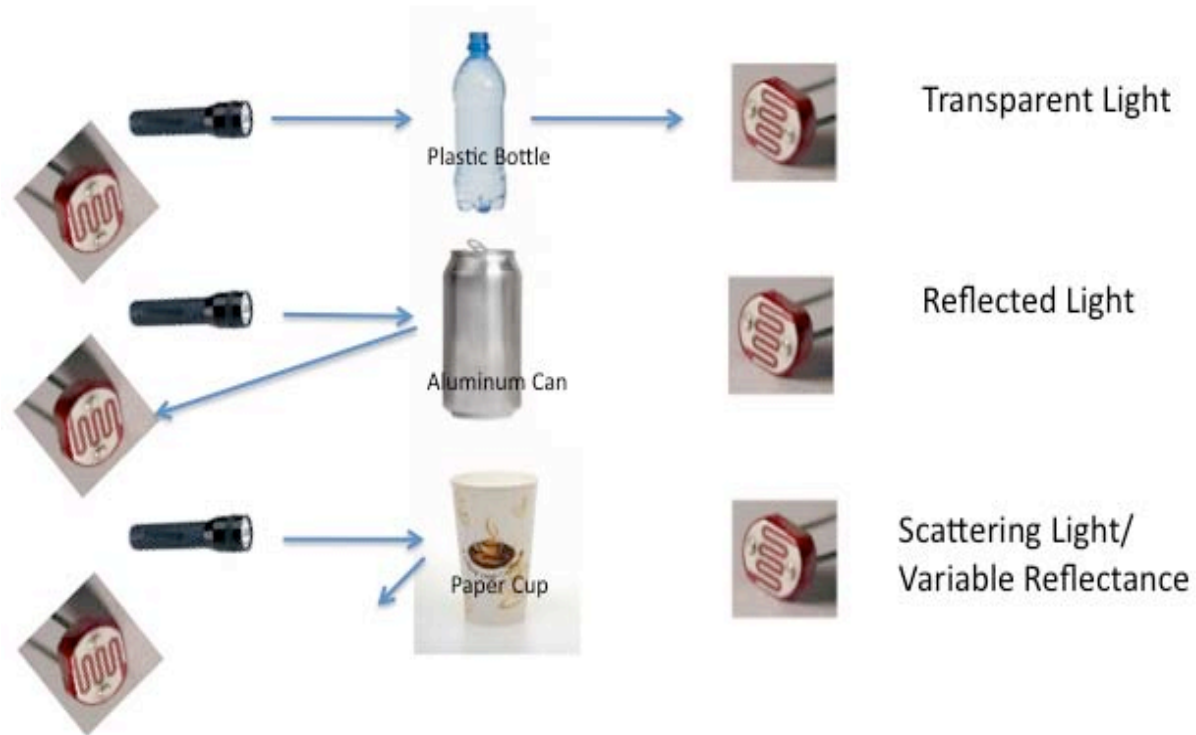
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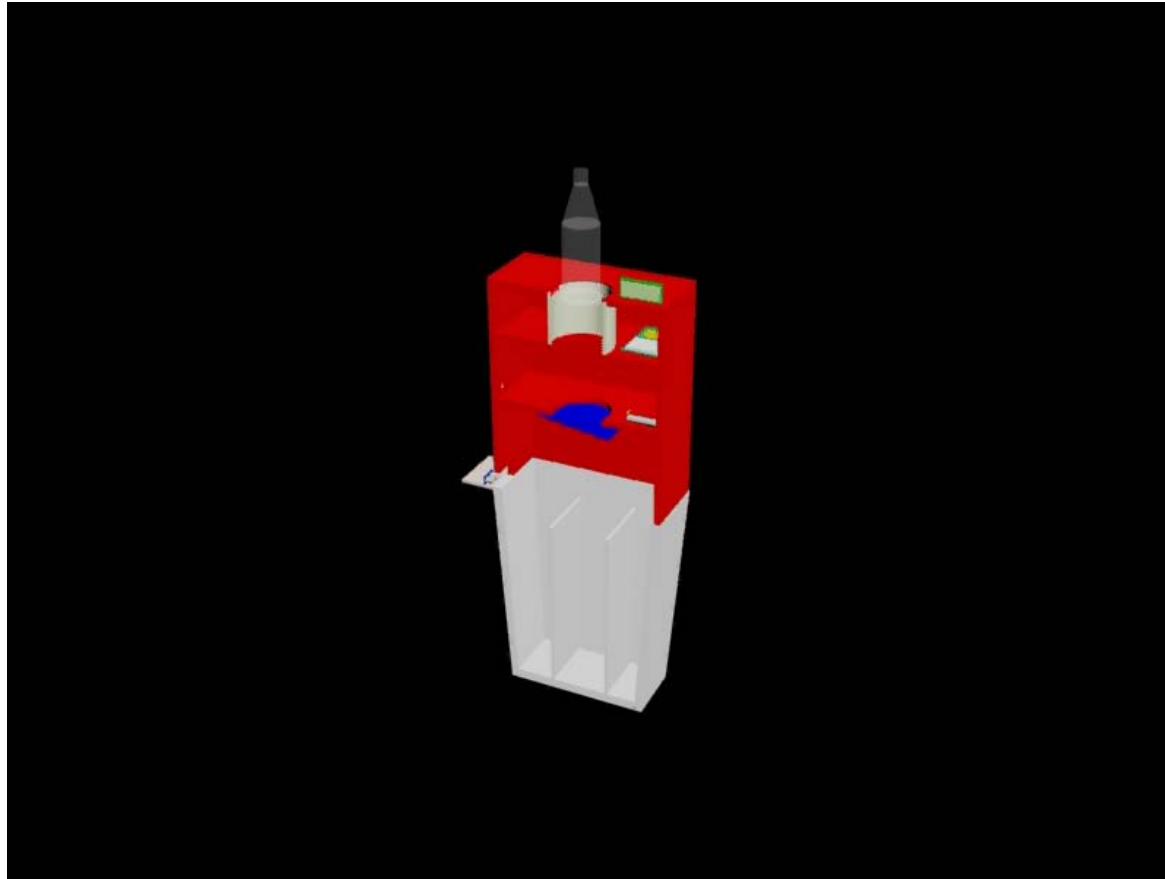
Light Source

Photoresistor

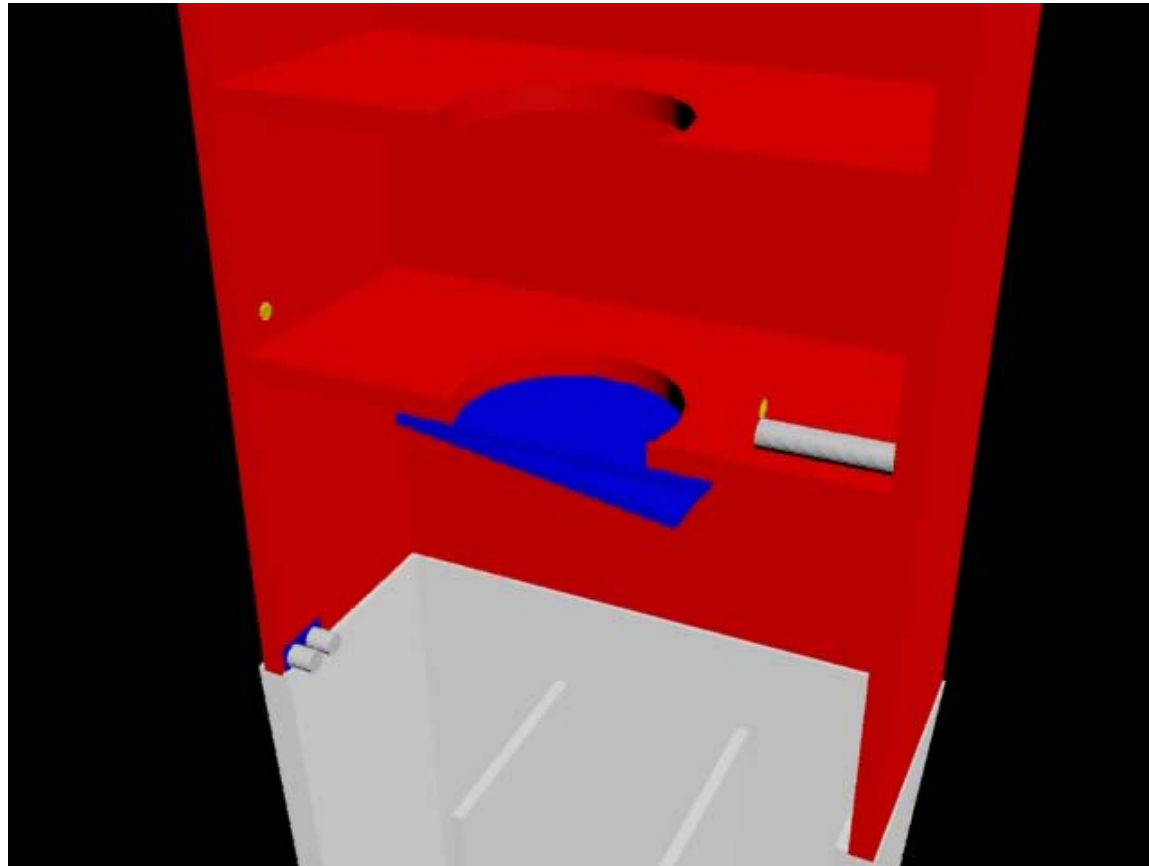
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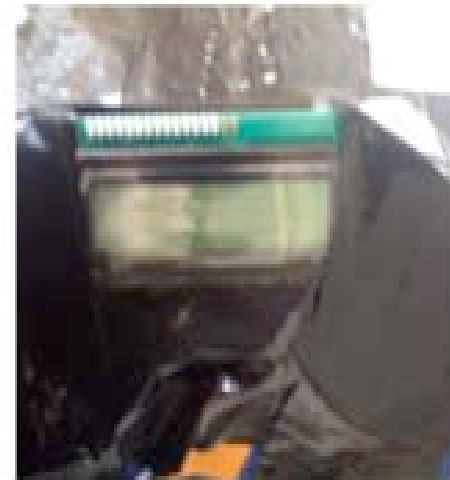
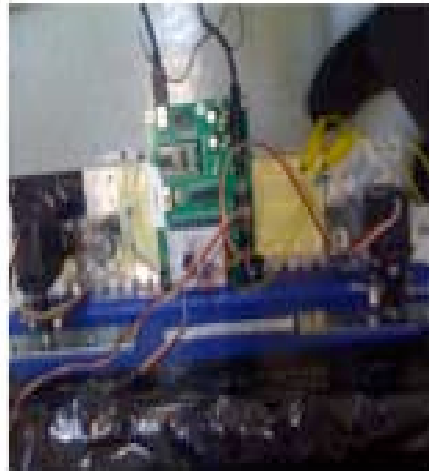
PHOTORESISTOR SMART TRASH CAN CONCEPT



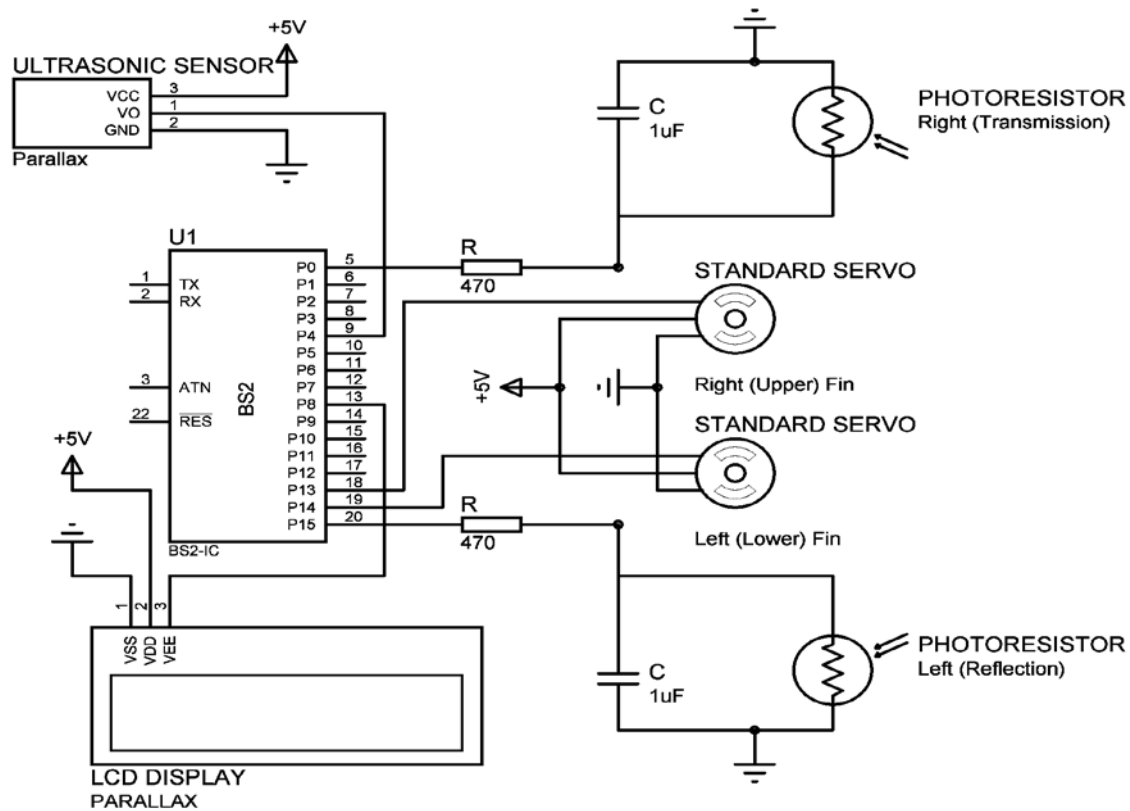
SMART TRASH CAN DETAIL



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Plastic Bottle	hightimeright = 05162 hightimeleft = 12050	lowtimeright= 04165 lowtimeleft= 09954
Aluminum Can	hightimeright = 42550 hightimeleft = 19742	lowtimeright= 34598 lowtimeleft= 14722
Paper Cup	hightimeright = 45538 hightimeleft = 12542	lowtimeright = 43780 lowtimeleft = 11417

Table 1: Experimental values extracted with the RCTime command for each photoresistor

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Bill Of Materials/ Photoresistor

- **BS2 \$240**
- **Cables \$ 2.00**
- **Labor \$200**
- **Light source with battery \$ 30.00**
- **Trash Can \$ 100.00**
- **Vex dirty parts kit \$ 20.00 on ebay**
- **Duck tape \$ 2.00**
- **Styrofoam \$ 2.00**
- **White Cardboard \$15.00**
- **Tape \$ 5.00**

Conclusions/ Future Work

- *We have designed two trashcans with the same capabilities based on resistance and capacitance

- *This opens up some great simple ideas for smart trash cans in homes and schools

- *More people would become interested in science, technology, engineer, and recycling if they have this in their homes and schools

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