WIRED ROBOTIC CAR

Primary Step in the Field of Robotics...

IEEE
Advancing Technology for Humanity

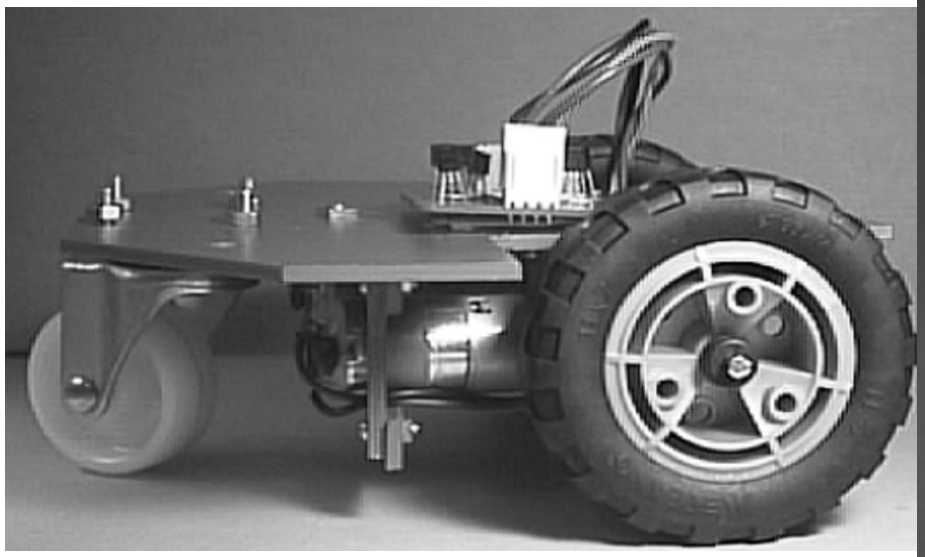
Objective

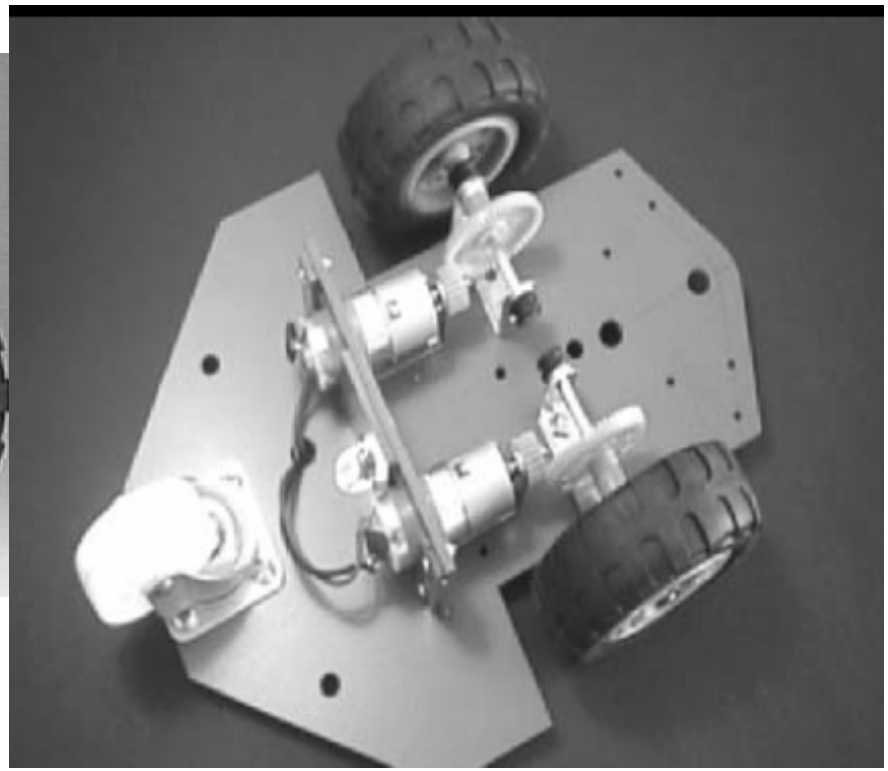
To design a manually controlled car capable of crossing a track flooded with various hurdles in minimum possible time.

This basically requires:

- A good design
- A good control
- Team co-ordination

Design



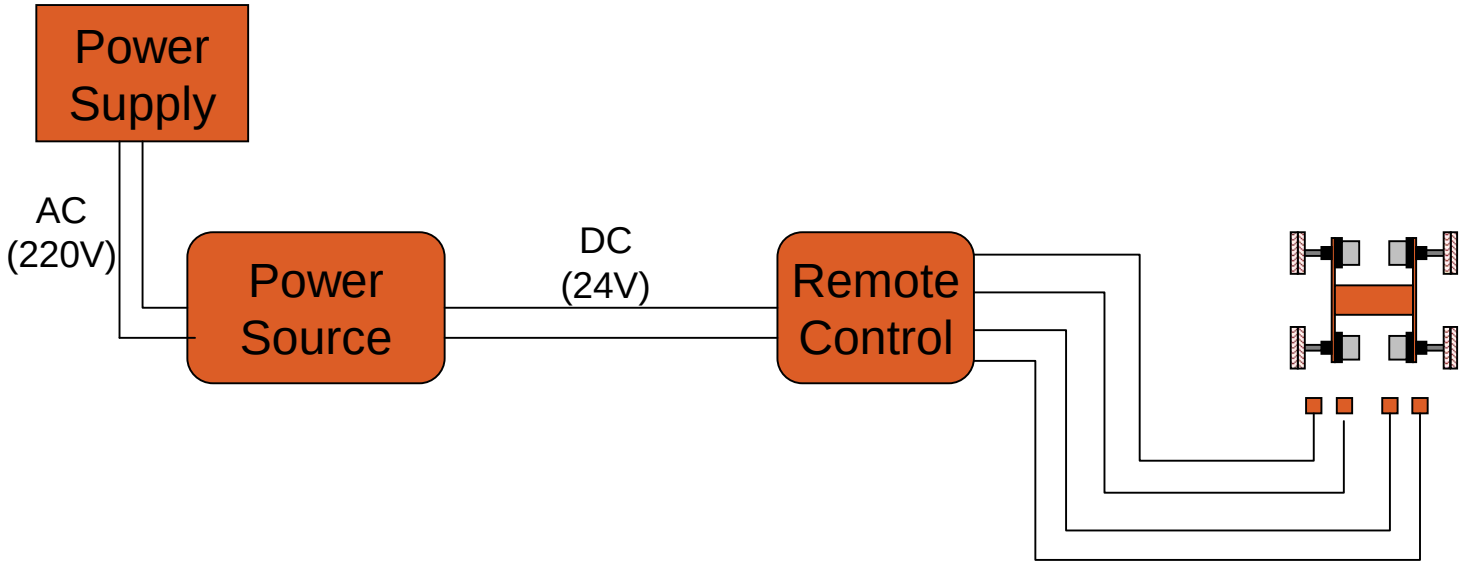


Wired Robotic Car

A simple assembly of various components like

- For Bot:
  - Motors
  - Wheel Set
  - Grip
- For Remote:
  - DPDT Switches
  - Circuit Board
- AC to DC Converter

Introduction



General Constraints

Every Robotic Hurdle Race involves various constraints like:

- Size Constraint

  (Generally 30x 30x 30cm or 25x 25x 25cm)

- Voltage Constraint

  (Generally 24 V DC)

- Power Constraint

Power Source
(AC to DC Conversion)

We are already familiar with the concept of AC & DC supply and conversion of AC into DC.
Various methods used for this purpose are:

- Rectifier
  - Transformer – step down transformer
  - Diode & Capacitor – to convert a.c to d.c
- Battery – for onboard operations of car
- Adapter – should be minimum of 12v and 500mA
- Laptop Charger

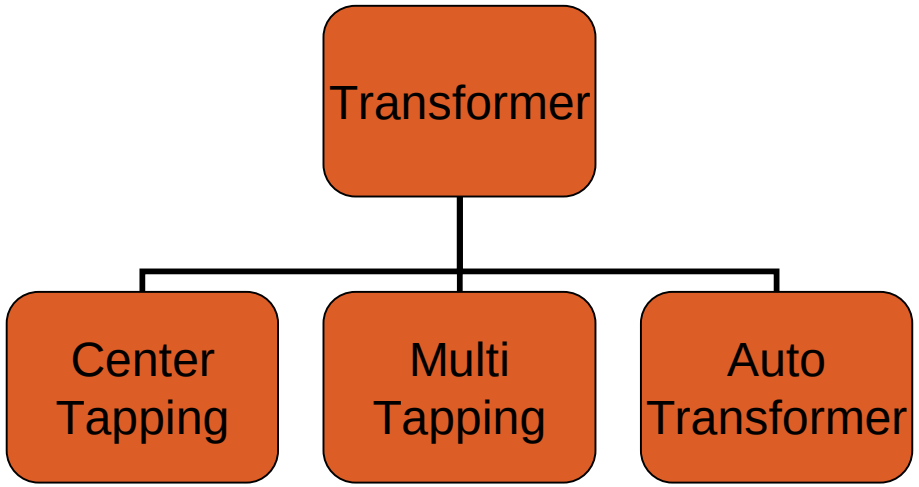
Transformer

Advantages:

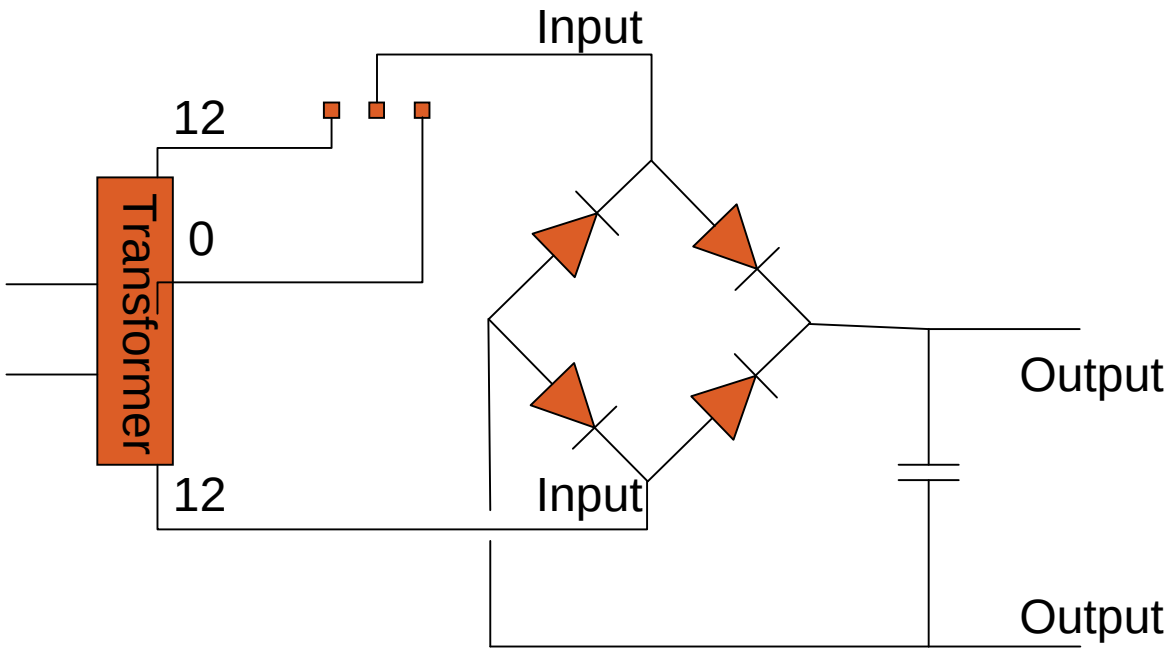
- Easily Available
- Cheap

Disadvantages:

- Current Weakens Due to Heating Effect
- Bulky



Transformer » Rectifier



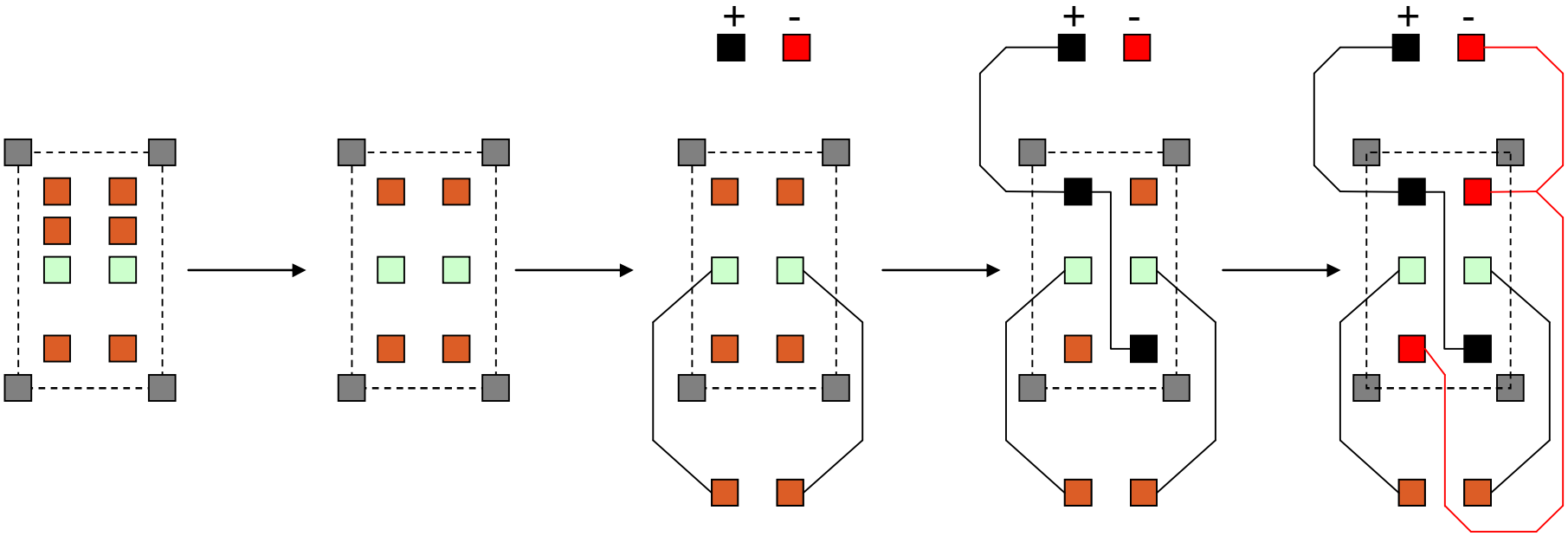
Specifications

- Transformer » Rectifier
  - 12-0-12 (Center Tapping)
  - 5 Ampere
  - Diode: 5608
  - Capacitor: 4700 µF, 36 V
- Laptop Charger
  - 18.5 – 19.5 V
  - 3.5 Ampere

Remote Design

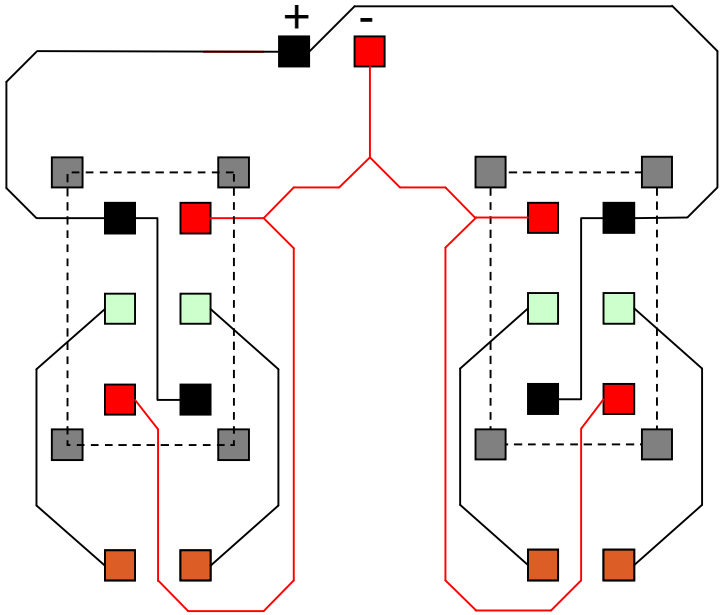
DPDT Connections

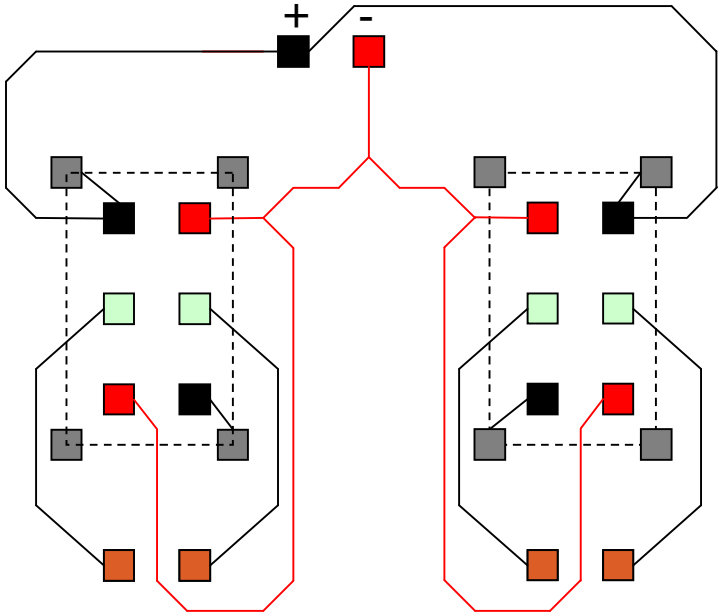
(Double Pole Double Throw)



IEEE
Advancing Technology for Humanity

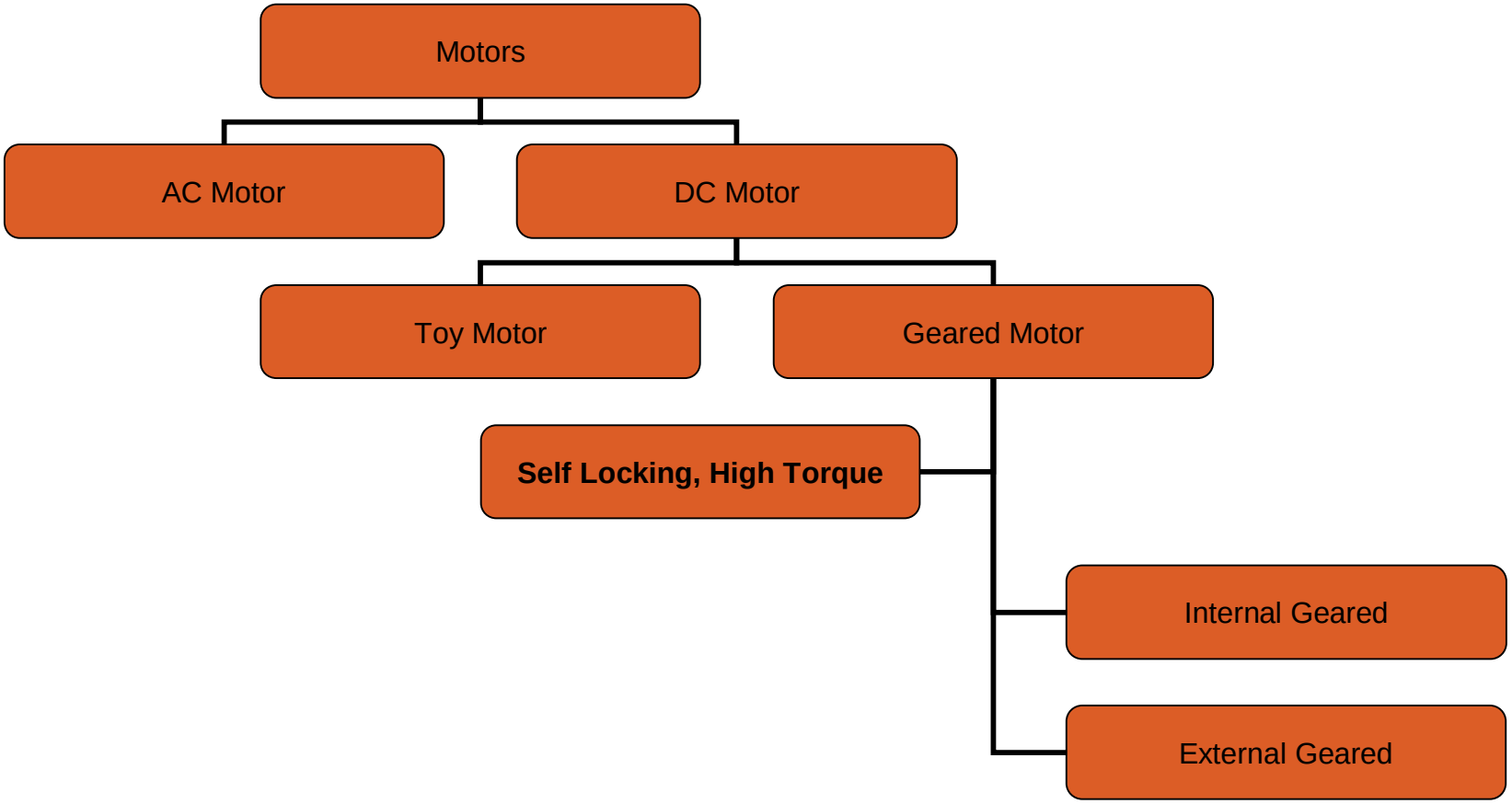
PCB Circuits
(Printed Circuit Board)





IEEE
Advancing Technology for Humanity

Motors



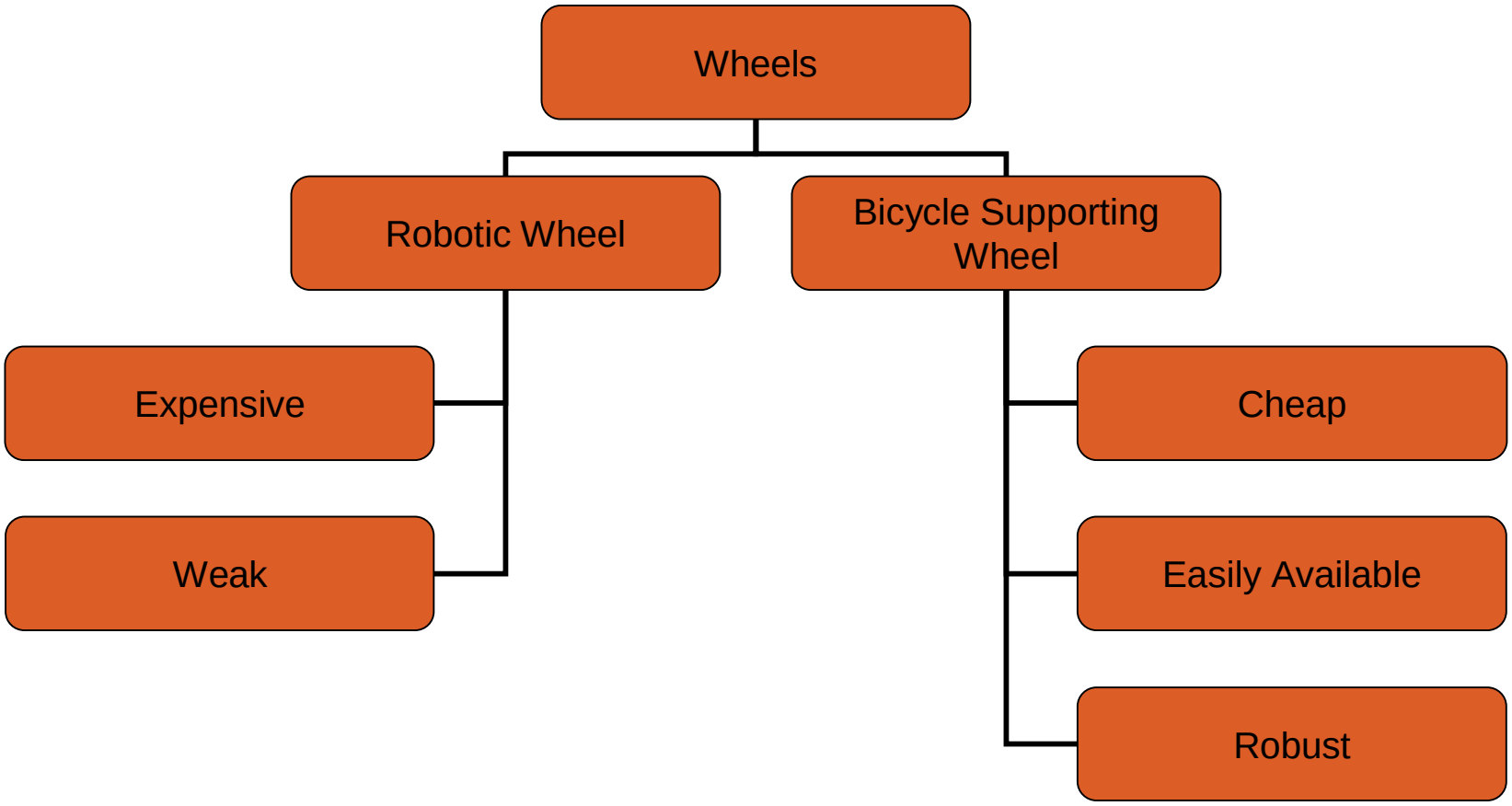
Specifications

- Voltage Rating
- Current Rating
- RPM
- Weight
- Shaft Dimension

General Basics

- Linear Speed = RPM x Radius
- RPM x Torque ≡ Power ≡ V x I
- Control Vs. Speed
- Gear Ratio

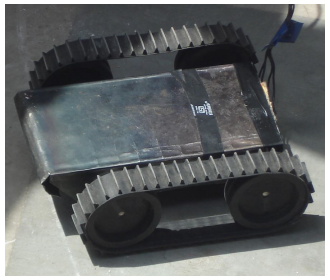
Wheels



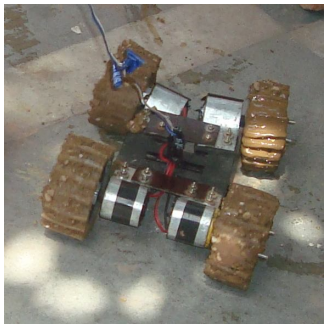
Specification
how to select wheel

- External Diameter
- Internal Diameter
  - Bush
- Thickness
  - Doubling
- Material & Surface

Wheel Surface
(Track Belts & Grips)



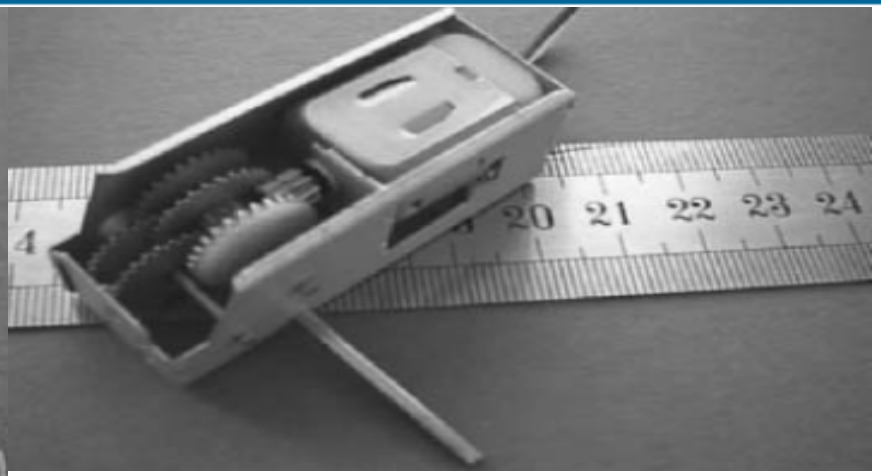
- Floor Mat
- Cricket Bat Grip
- Tyre Tube
- Front to Rear Belt
  - Tank type track belt



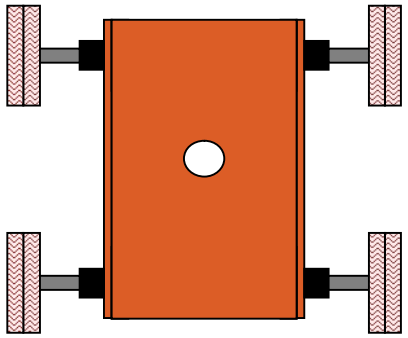
IEEE
Advancing Technology for Humanity

Assembly of Components

- Using Internal Geared Motor
- Using External Geared Motor



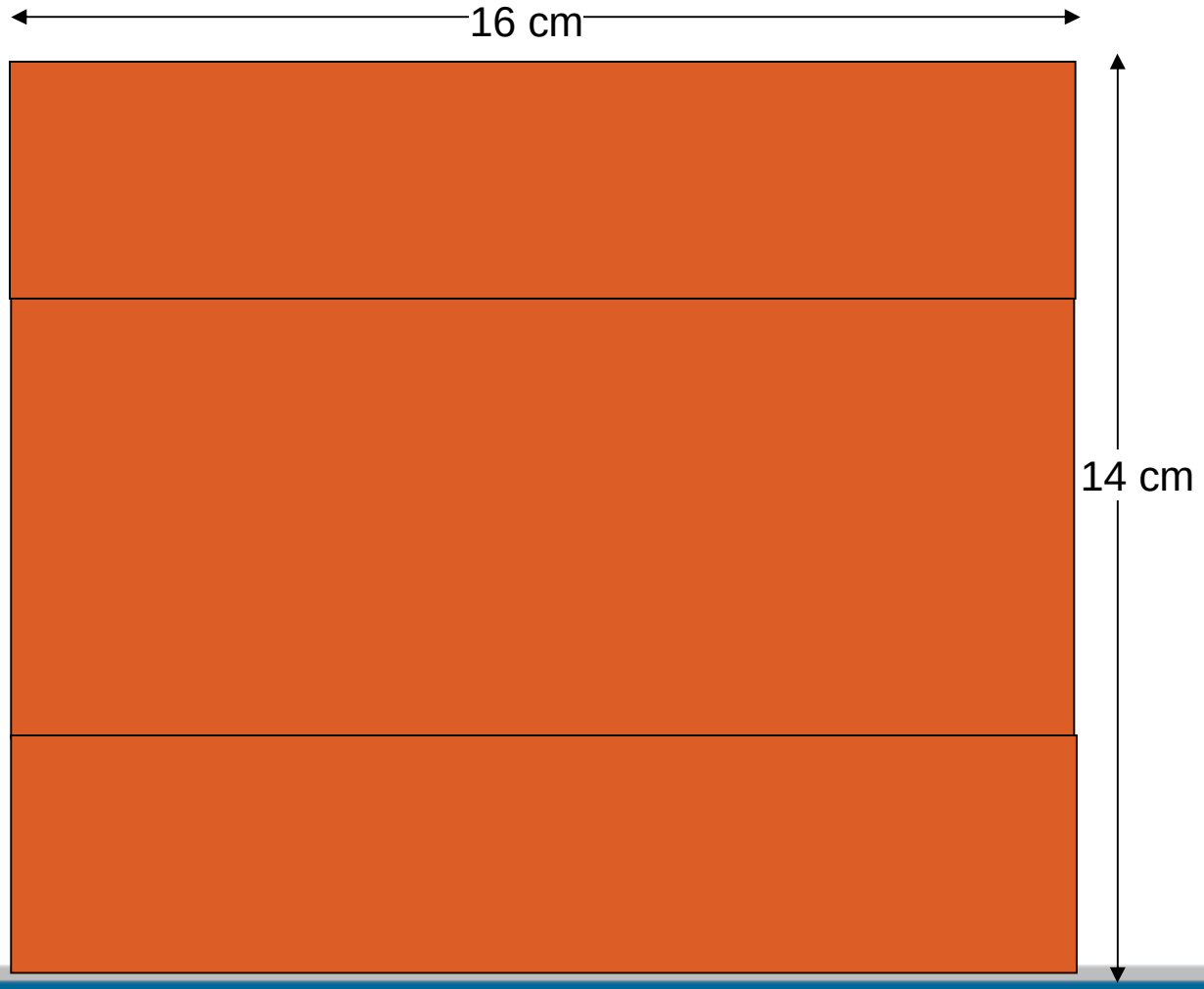
Simplest Car



- Material Used:
  - 4 x 100 rpm Motors (Robokit, Vega)
  - 8 Wheels (Diameter = 6 cm)
  - Floor Mat as Track Belt
  - Iron Chassis
  - DPDT Remote Control
  - Laptop Charger as Power Source

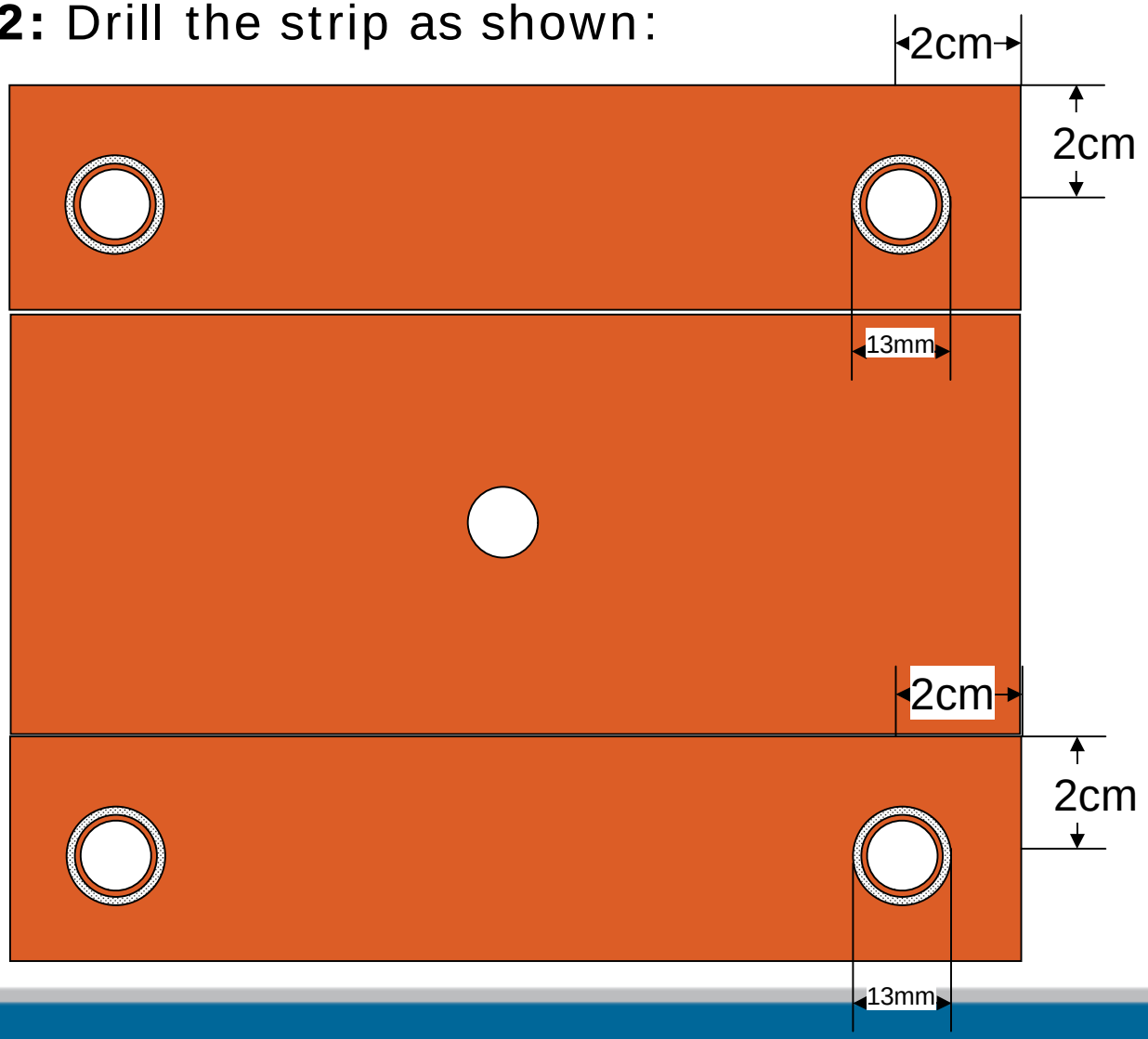
Chassis

- **Step 1:** Take an iron strip of around 1 mm thickness



Chassis

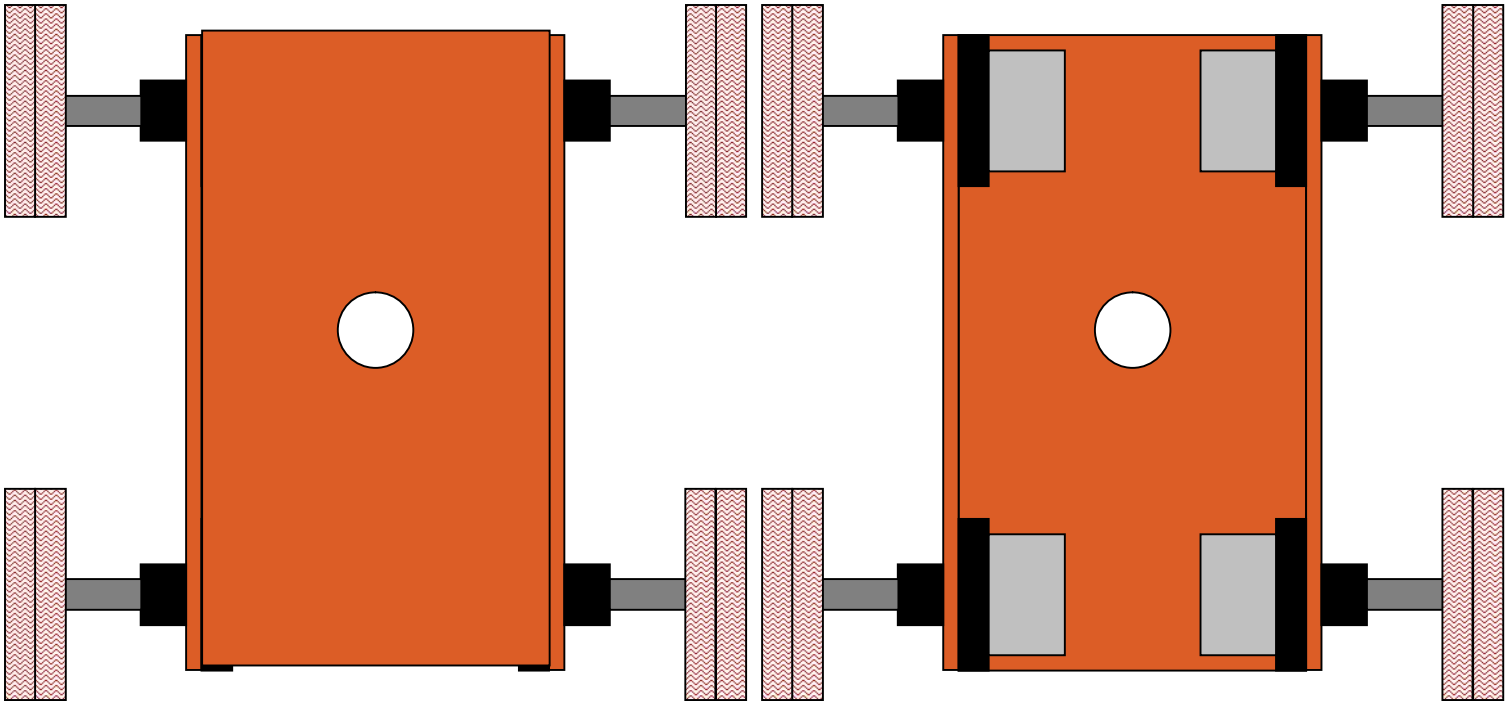
- **Step 2:** Drill the strip as shown:



IEEE
Advancing Technology for Humanity

Chassis

- **Step 3**: Bend the strip perpendicularly at a distance of 4cm from left & right edge
- **Step 4:** Screw up motors & other accessories.

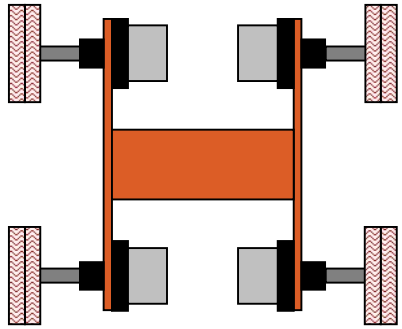


Top View

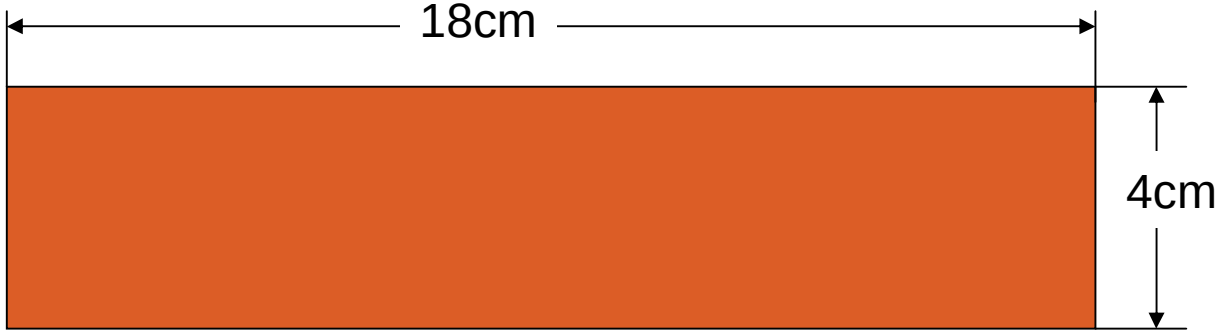
Bottom View

IEEE
Advancing Technology for Humanity

Slight Change



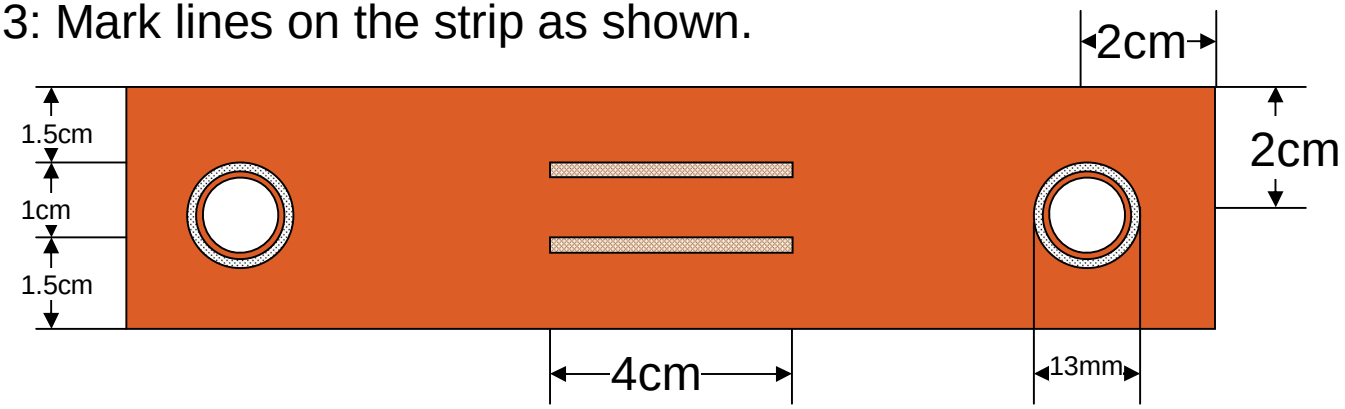
Step 1: Take an iron strip of around 1 mm thickness



Step 2: Drill the strip as shown

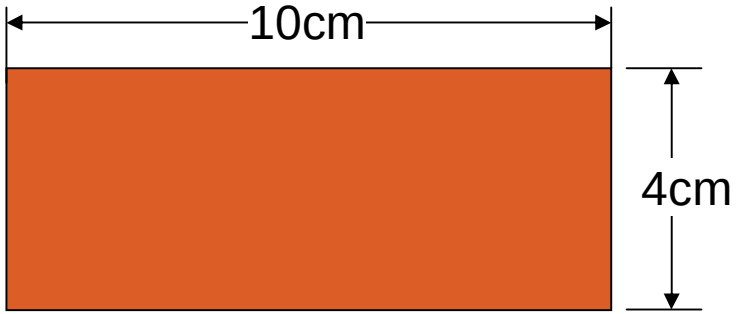
IEEE
Advancing Technology for Humanity

Step 3: Mark lines on the strip as shown.



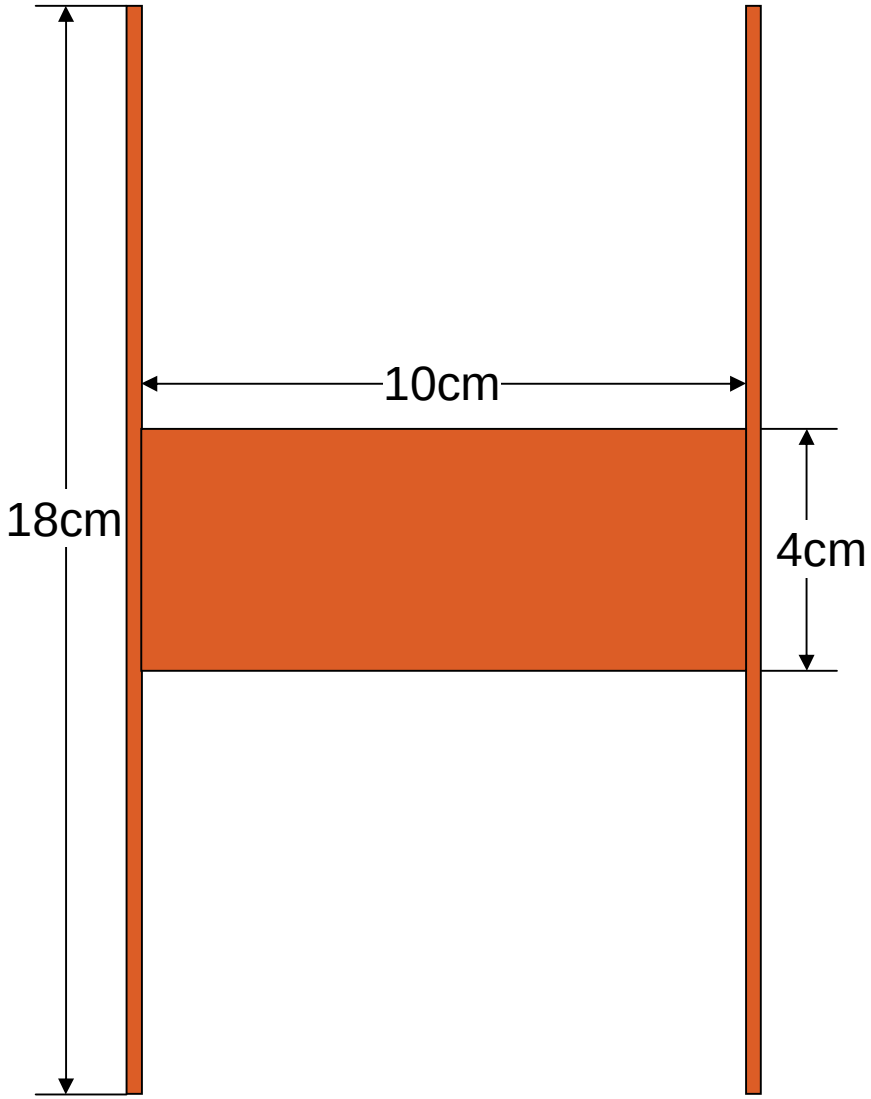
Repeat Step 1-3 to make a similar strip.

Step 4: Take two another strips of shown dimensions



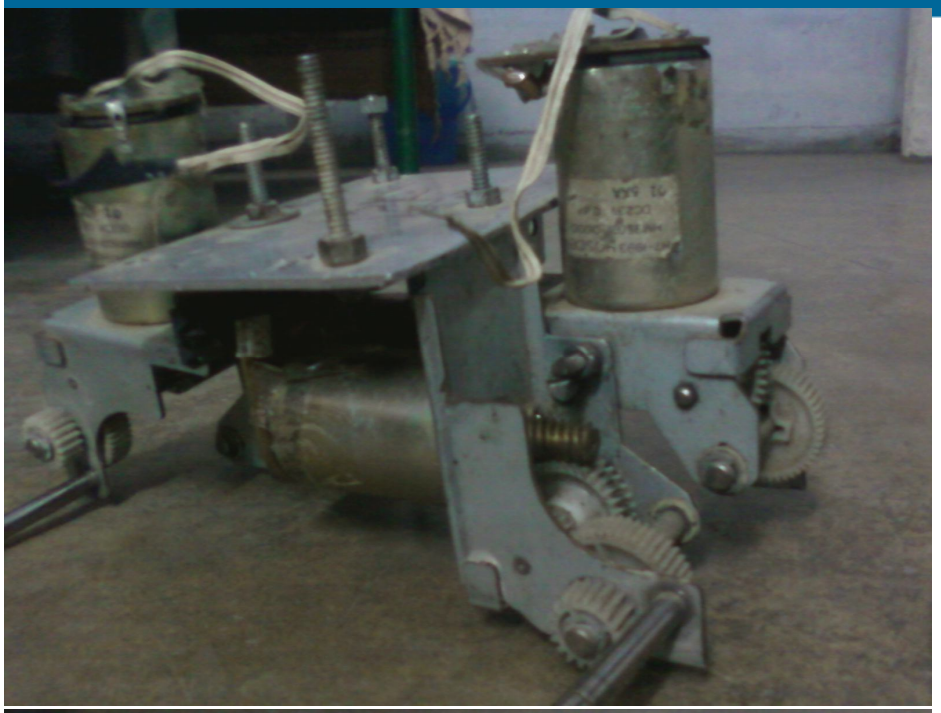
IEEE
Advancing Technology for Humanity

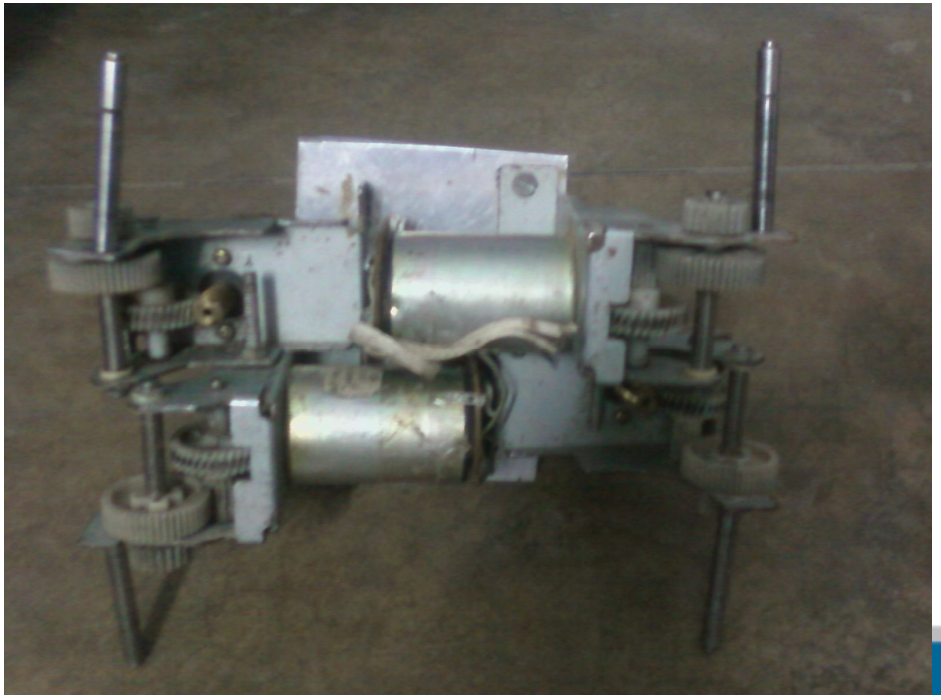
Step 5: Place the two strips made in Step1-3 in the vertical plane and weld them together with the help of strips made in step 4.



Most Successful Design

- Material Used:
  - 4 x 100 rpm Motors (External geared)
  - 4 Wheels (Diameter = 10 cm)
  - Floor Mat as Track Belt
  - Iron Chassis
  - DPDT Remote Control
  - Transformer as Power Source






Milind Singal: 9873243053
Ajay Verma: 9911982505
Mohit Gupta: 9466643004


Thank You!