

Pitch Perfect

Name – Ayush Agarwal

Problem solved – Present models of oscillating fans/coolers do not keep pointing towards the person as the person moves around the room ,and are also not smart enough to change their settings as per the surroundings, hence I came up with a unique product to solve this problem

Utopia – I would like to solve the above problem using my skills in mechatronics and IOT . By using sensors and microprocessors , I have come up with a solution that detects and keeps pointing towards the person

About the product –

About the basic version (single person version)- Oscillating fan which points towards a particular person in a room (if there are 2 people in the room , then I have an addon version too to solve that problem)

The oscillating fan part is a motor whose speed and direction can be easily controlled by L239D chip (yeah , one could need the reverse direction for sucking out smog , but whatever , it's not the main attraction)

The fan oscillates using the 4 bar mechanism we all know (it's not directly available in proteus so I might just assume that the fan rotates 360° for now in proteus , and make changes in the real model)

The IR sensor is to be attached to the front part of the fan , the fan motor keeps rotating , let's focus on the direction motor now .

When a person is detected by the IR sensor , it will return high voltage , which will (by the means of an electronic switch(bjt transistors)or maybe a solenoid switch) deactivate the direction motor , thus the fan stops

When there is no one around, the IR sensor returns 0 (low voltage , negligible) , which will close the electronically operated switch , thus fan will keep swinging

An add on feature , the strength of the IR sensor depends on the voltage at Vcc and so does the range , so we can even change the range of the fan detection (obviously going to use a potentiometer to give in variable voltage)

About the advanced version (multiple people applicable version)-

Instead of the IR sensor on the fan , we can attach a mini camera to the fan and attach it to a microprocessor (like raspberry pi) . It sweeps the area once, and in that sweep , it notes down the angles at which it detected human using a rotatory encoder , which sends the data to the microprocessor . The humans can be easily detected using haar cascades and opencv libraries of python . Then it finds out the maximum and the minimum angle values at which a person was detected , and then it oscillates only between those 2 angles , thus making sure that everyone receives the air , and the fan does not go into zones where no one is sitting . This angle can be changed by doing the calculations in the microprocessor , and then varying the length of one of the arms in the 4 bar mechanism , using any linear actuator . The microprocessor is also connected to a wifi module like ESP8266 , so that it can also be controlled by a phone . This control will specially be

important when the number of people will become less , so that a command can be given to reset it and execute the first detection sweep again .

Add on feature –

1.) We can also add a temperature and a humidity detector using temp-humidity sensor , which can decide the speed of the blades of the fan .

2.) Similar things can be done to a cooler , to make a **smart cooler** . Furthermore , the amount of water being pumped out can also be changed depending on the inputs from the temp-humidity sensor .

Target Market – Anyone who uses an oscillating fan . These fans are used a lot in offices .

Competitions – Technically any company which sells oscillating fan .

The team –

Name – Ayush Agarwal

College – IIT BHU Varanasi

Branch – Electronics

Future roadmap – not planned yet