**Experiment- INNOVATION**

**Aim :** To create a simple neural network predictor that predicts if white or black text looks better on a given rgb background.

**Software used :** Javascript (nn.js, ml5.js, p5.js)

Background information : This program is run in Javascript with the help of open source machine learning libraries used in javascript I.e. ml5.js this is called using nn.js which is a javascript based neural network library and p5.js is used to add canvas elements to html. It is modified version of a demonstration made by Jabrils using genetic algorithm : (https://brain.js.org/)

**Code :**

**HTML**

<!-- content of index.js -->

<!DOCTYPE html>

<html>

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1">

    <title>colorpredictor</title>

    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/0.6.0/p5.min.js"></script>

    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/0.6.0/addons/p5.dom.min.js"></script>

    <script src="lib/nn.js"></script>

    <script src="lib/matrix.js"></script>

    <script src="sketch.js"></script>

</head>

<body>

</body>

</html>

**JAVASCRIPT**

//content of sketch.js

let r,g,b;

let which = "black";

function setup() {

createCanvas(640, 360);

noLoop();

brain = new NeuralNetwork(3,3,2);

for (let i =0; i <1000 ; i++) {

let r = random(255);

let g = random(255);

let b = random(255);

let targets = trainColor(r,g,b);

let inputs = [r/255,g/255,b/255]

brain.train(inputs, targets)

}

pickColor();

}

function pickColor() {

r = random(255);

g = random(255);

b = random(255);

redraw();

}

function mousePressed() {

// let targets;

// if(mouseX > width / 2){

// targets = [0,1];

// } else{

// targets = [1,0];

// }

// let inputs = [r/255, g/255, b/255];

// brain.train(inputs, targets);

pickColor();

}

function colorPredictor(r,g,b){

let inputs = [r/255, g/255, b/255];

let outputs = brain.predict(inputs);

console.log("color: ", r+g+b);

console.log(outputs);

if (outputs[0] > outputs[1]) {

return "black";

} else {

return "white";

}

}

function trainColor(r,g,b) {

if(r+g+b > 380) {

return [1,0];

} else {

return [0,1];

}

}

function draw() {

background(r, g, b);

strokeWeight(4);

stroke(255);

line(width/2 -5, 0 , width/2 - 5, height);

textSize(64);

noStroke();

fill(0);

textAlign(CENTER, CENTER);

text("black", 150, 100);

fill(255);

text("white", 450 , 100);

let which = colorPredictor(r,g,b);

if(which === "black"){

fill(0);

ellipse (150, 200 , 60);

} else {

fill(255);

ellipse (450, 200 , 60);

}

}

**Output :**



