WELCOME

SMART AUTOMATION USING MACHINE LEARNING ALGORITHMS AND NEURAL INTERFACE

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CONTENTS

INTRODUCTION

- Smart Home Systems are the subset of everyday computing.
- When this application is controlled by machine intelligence to provide circumstance-aware settings.
- Here we define an improved Home automation system using multiple machine learning algorithms

OBJECTIVE

- To bring Strict Power Control and Save Energy
- To Achieve an intelligent control system
- To Bring Down the Manual Setting to Zero With Intelligent Control

LITERATURE SURVEY

NO	PAPER	ADVANTAGES	DISADVANTAGES
1	**Smart Energy Efficient Home Automation System Using IoT**	• Less Manual Control	• Only Have A Web Based Control • No Learning System
2	**i-learning IoT: An intelligent self learning system for home automation using IoT**	• Less Manual Control • Learning System	• Uses Less Accurate Learning Algorithm
3	**Enhanced Smart Home Automation System based on Internet of Things**	• Less Manual Control • App Based System • Can Controlled By Anywhere In The World	• Not A Learning System • Does Not Have Web Capability

LITERATURE SURVEY

NO	PAPERS	ADVANTAGES	DISADVANTAGES
4	**Enabling IoT automation using local clouds**	• Less Manual Control • Wide range of IOT Device Capabilities • APP AND WEB Based	• Internet Is Requirement For Connecting More Device Inoperability
5	**Smart Automation using Machine Learning Algorithms**	• No Manual Control Required • No App or Web Based Apps Required • Complete Learning System • Facial Recognition • Internet Is Not A Mandatory	• User Must Depend On Some Manual Control Until System Learns User Pattern

EXISTING SYSTEM

- Traditional home automation systems that provide only remote access and control
- They are not that effective in terms of being ‘smart’
- Has Lot of Manual Control
- Need an interface for operation
- Not Efficient

PROPOSED SYSTEM – Emotion Recognition Mode

- Proposed System Uses SVM (Support Vector Machine)Classifier
- By using Supervised Learning, the algorithm will output a hyper plane which categorizes new examples.
- To use SVM to recognize facial expression, we extract facial landmark key points first and then it is given to SVM classifier to detect user's mood

PROPOSED SYSTEM – Emotion Recognition Mode

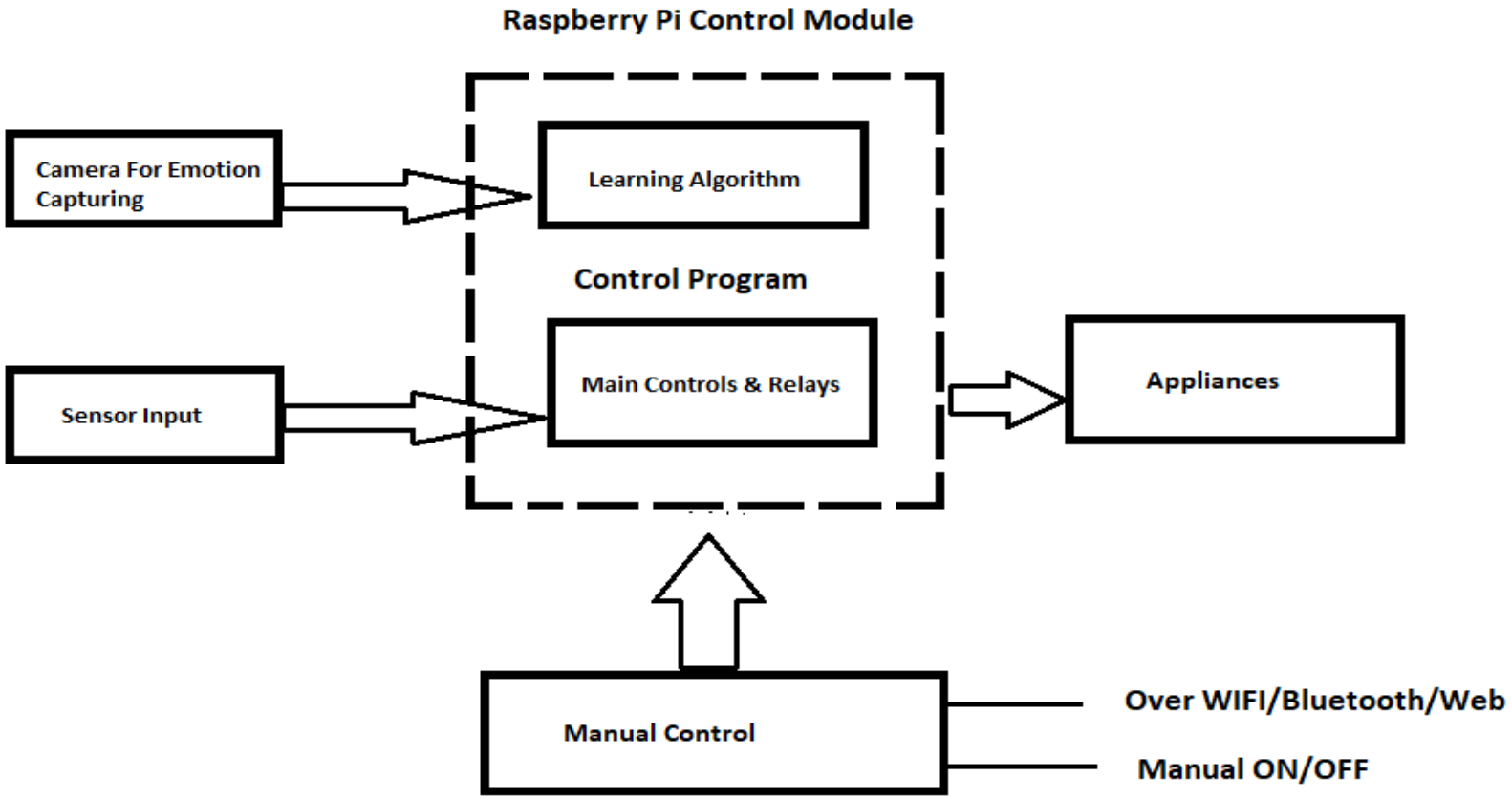
- To detect the landmarks that are crucial points required for identifying the emotions/expressions, we use DLib library for python
- Normalization of key-points is done by calculating the mean of x and y axes which gives us the coordinates for center of gravity in all facial landmarks.
- DLib Library file help to identify eyes,lips,nose,etc attributes on face

PROPOSED SYSTEM – Neural Interface Mode

- Proposed Mode Uses EEG(Electro Encephalograph)sensor to detect beta waves from brain
- These waves are transmitted over Bluetooth or Wi-Fi to Our system for processing
- According to wave pattern respective profiles are switched

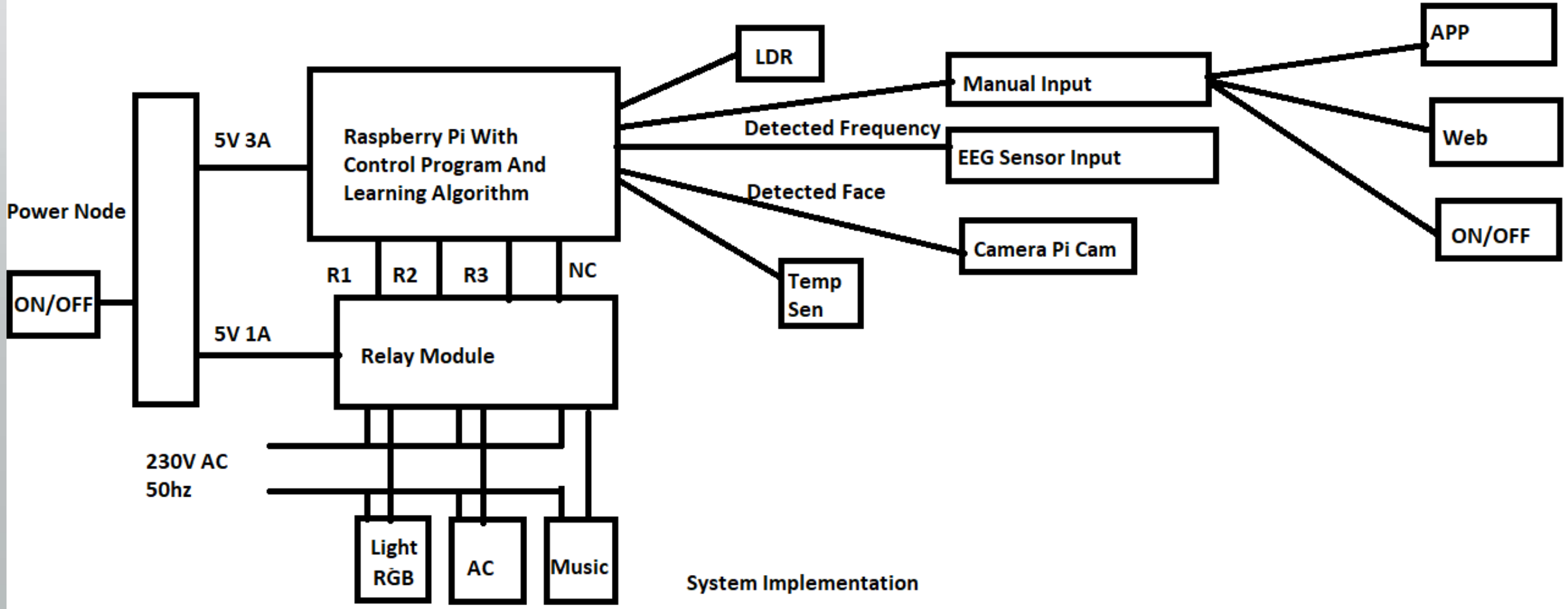
SYSTEM ARCHITECTURE

ARCH/ML/NI/4



Architecture of Smart Automation Using Machine Learning Algorithms And Neural Interface

DESIGN DIAGRAM



System Implementation

REQUIREMENTS

- Main Components Required
  - Raspberry Pi
  - Relay 5v||230v 10A x 4
  - PI Cam 720p
  - EEG Sensor,Temp sensor,LDR,Humidity Sensor,

Services Required

IFTTT

Blynk

Git

MODULE 1 – **MANUAL MODE**

- Connected ESP8266 to Network Via WIFI Authentication
- Controls relay via Blynk App through Blynk App
- Relay Controls Connected Appliances
- Expected Outcome :- Control 4CH Relay Manually through Blynk App

MODULE 2 – **AUTOMATIC MODE**

- In Automatic mode system uses existing data's of user usage patterns and data from sensors to switch profiles
- Voice commands can be used to control the system status

MODULE 3 – **EMOTION RECOGNITION MODE**

- Connected Webcam is used to detect emotion
- Face and facial landmarks are used to identify emotion
- According to emotion profiles are switched
- Each profile contain different tasks

MODULE 4 – **NEURAL INTERFACE MODE**

- Uses EEG Sensor to Interface with Brain to Carry brain wave signals to raspberry
- Modulation of waves carries different instruction to raspberry pi to perform different tasks
- EEG sensor is tuned to detect beta waves which deals with consciousness
- According to wave modulation profiles are switched

EXPECTED OUTCOME

- Implement a Intelligent System That controls Usage of Electricity
- Proposed System Brings Easiness & Comfort to Users
- Bring Manual Control To Zero

CONCLUSION

- In Next Stage complete integration of facial detection and profile switching will be added
- Project Completion Rate :- 38%

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THANK YOU