BELLA – THE SMART HOME ASSISTANT

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Abstract:

Technological advancements over the past century have been tremendous. Technology, as we know it, constantly keeps reaching new heights of functionality and power. We have revolutionizing concepts like Artifical Intelligence, Machine Learning, Embedded systems, Internet of Things, Problem-Solving Algorithms constantly being developed and implemented.

However, our homes are still comparitively non-smart in nature. This is where Bella steps in to convert our non-smart homes and appliances into state-of-the-art intelligent systems. Bella is an Artificial Intelligence System that provides Home Automation over Voice Control and behaves as an Assistant.

Index Terms – Artifical Intelligence, Internet of Things, Home Automation, Smart Assistant, Assistive Technology, Voice Control, Smartphone technology.

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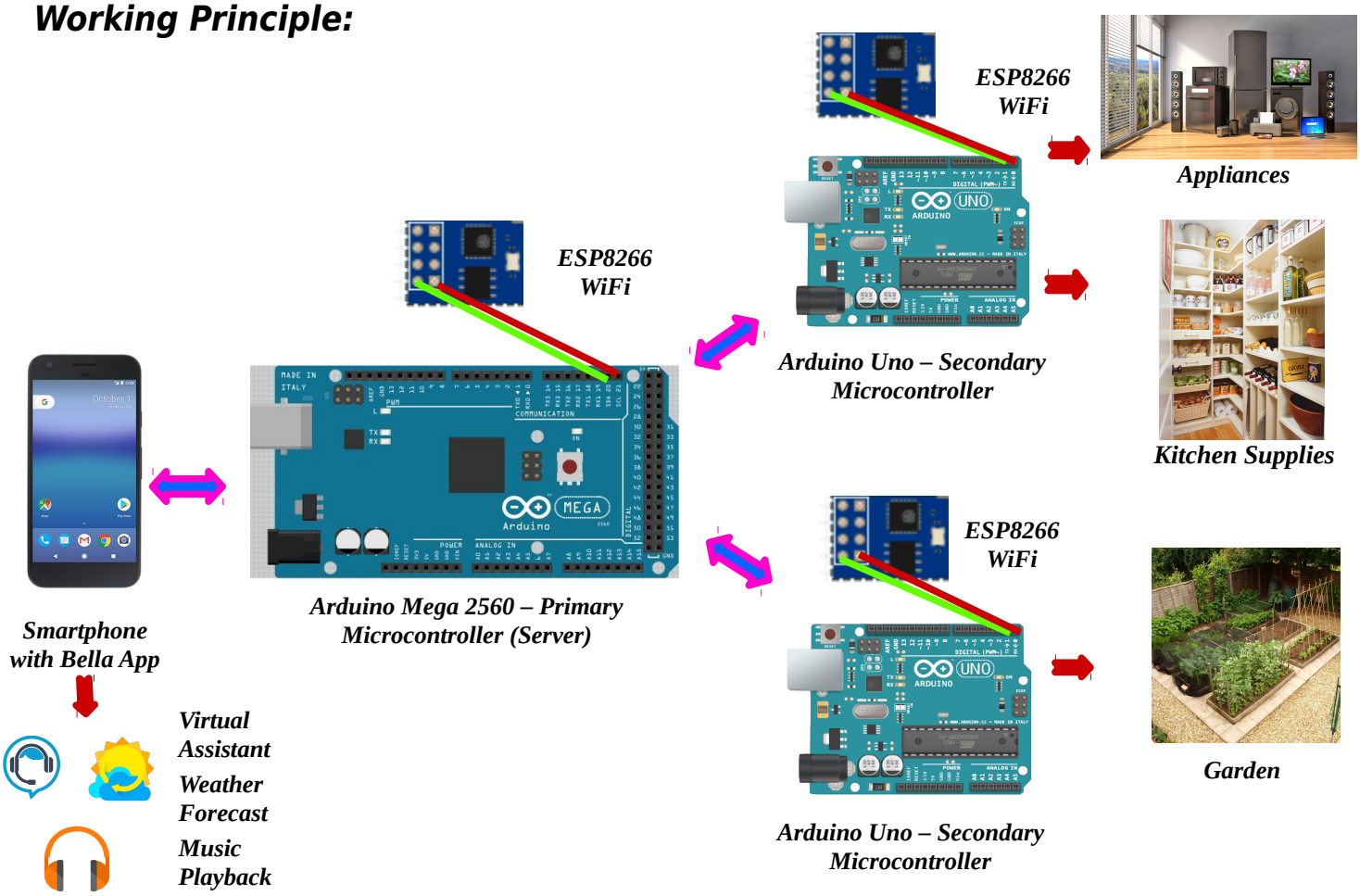
Introduction:

Bella, is a home automation system that applies powerful concepts like Artifical Intelligence, Voice Control, Embedded Systems and Internet of Things.
Bella consists of on app, that runs on an android phone. It packs Voice Access, which allows the user to automate their home by issuing commands by merely saying it out. Bella takes voice as input and performs tasks.

Components:

- Arduino Mega 2560 * 1
- Arduino Uno * 2
- ESP8266 Wi-FI shield * 4
- Water Sprinkler * 1
- Moisture Sensor Module * 1
- HC-SR04 Ultrasonic Senor Modules * 3

Working Principle:



- The Bella app connects to the entire system over WiFi.
- When a Voice Command is issued, the command is simplified and sent to Arduino Mega.
- Arduino Mega then decides to which secondary controller the command has to be sent.
- All the microcontrollers are WiFI enabled using ESP8266 WiFi shield.

Functionality:

- Acts as a virtual assistant which is interactive and integrates Internet of Things with Voice Control in our homes.
- Bella takes input as voice and can output information on screen as well as voice. It is capable of text to speech and speech to text.
- Bella performs tasks based on its AI which is written from scratch.
- Bella integrates with all appliances and embedded systems at home over Wi-Fi.
- Seamlessly monitor home appliances and toggle their on/off status.
- Monitor outdoor/indoor smart garden system by measuring soil moisture levels and controlling water sprinklers.
- Real-time monitoring of Kitchen Grocery by providing ration levels in containers.
- Fetches Weather Information and makes it available for the user.
- Bella can also play songs to lighten the mood.

Drawbacks:

- Voice Detection can be unstable at times. Manual Control is provided in this case.
- Artificial Intelligence is constantly updated. New features have to be tested rigourously to be applied.