VARNA

Breath Enabled Assistive Communication Device

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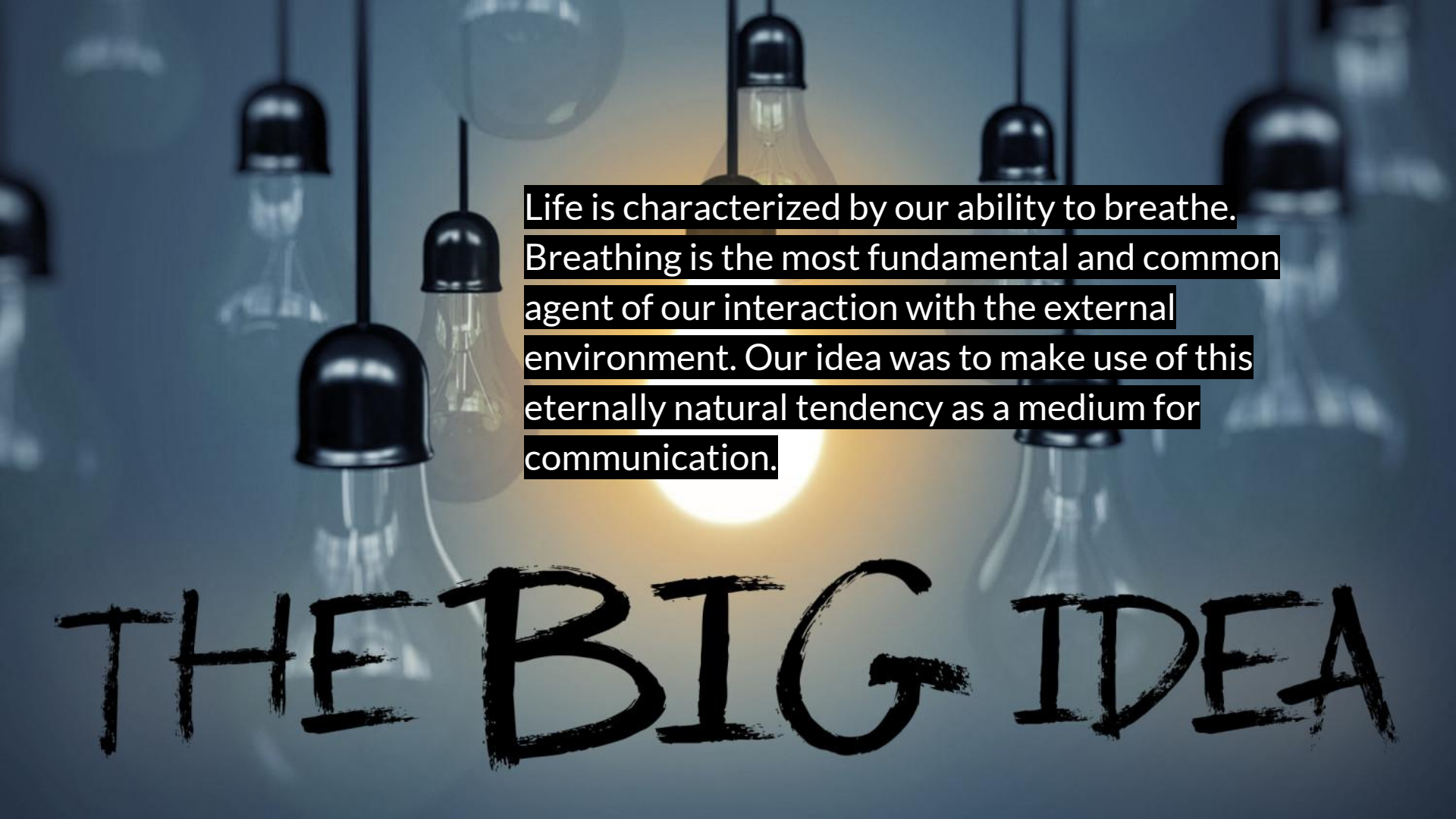

Life is characterized by our ability to breathe. Breathing is the most fundamental and common agent of our interaction with the external environment. Our idea was to make use of this eternally natural tendency as a medium for communication.
THE BIG IDEA

1. Intro

- We’re trying to use one’s breath as a mode of communication. The idea is to segregate breaths into two distinct types: Long(-) and Short(.), and then code the alphabets, digits and symbols in terms of these ‘dots’ and ‘dashes’ (Morse Code).
- Useful Information can be analysed using appropriate encoding-decoding techniques to get human readable text which can then also be translated to computer generated voice using appropriate TTS softwares.

Place the sensor under the nose or mouth as per your convenience.

Make short exhales (sniffs) to send Dots as in the Morse Code.

Make little longer exhales to send Dashes as in the Morse Code.

Wait for a beep from Earclip after completion of word.

Repeat the same steps for other words, phrases and sentences.

Let TALK do its magic and speak out your expression.

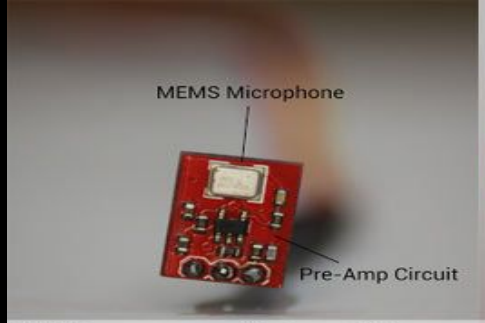
Key Components of Varna

Arduino Mega

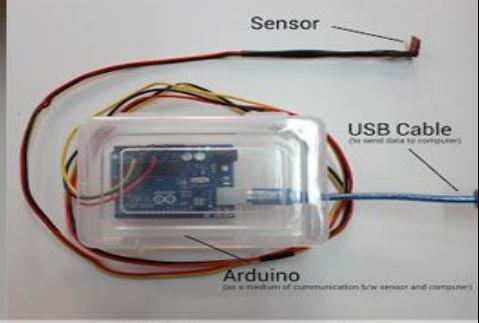
BMP180 Pressure Sensors

XFS5152CE TTS Module

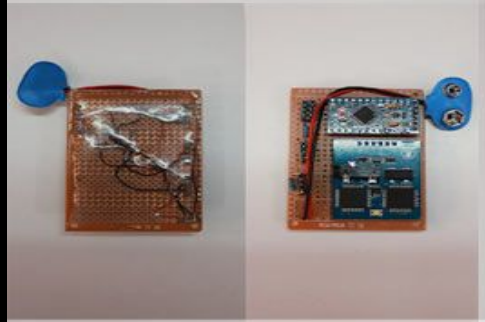
Speakers

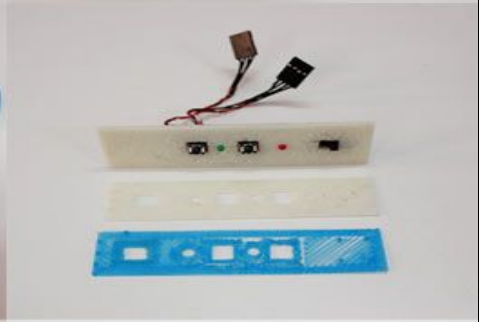


Talk Prototype - 01 Breath Sensor

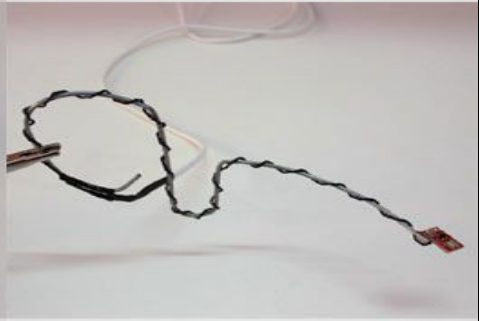


Talk Prototype 01


Computation & Synthesisation Circuit


3D Printed Input Panel Iterations


3D Printed Enclosure Iterations

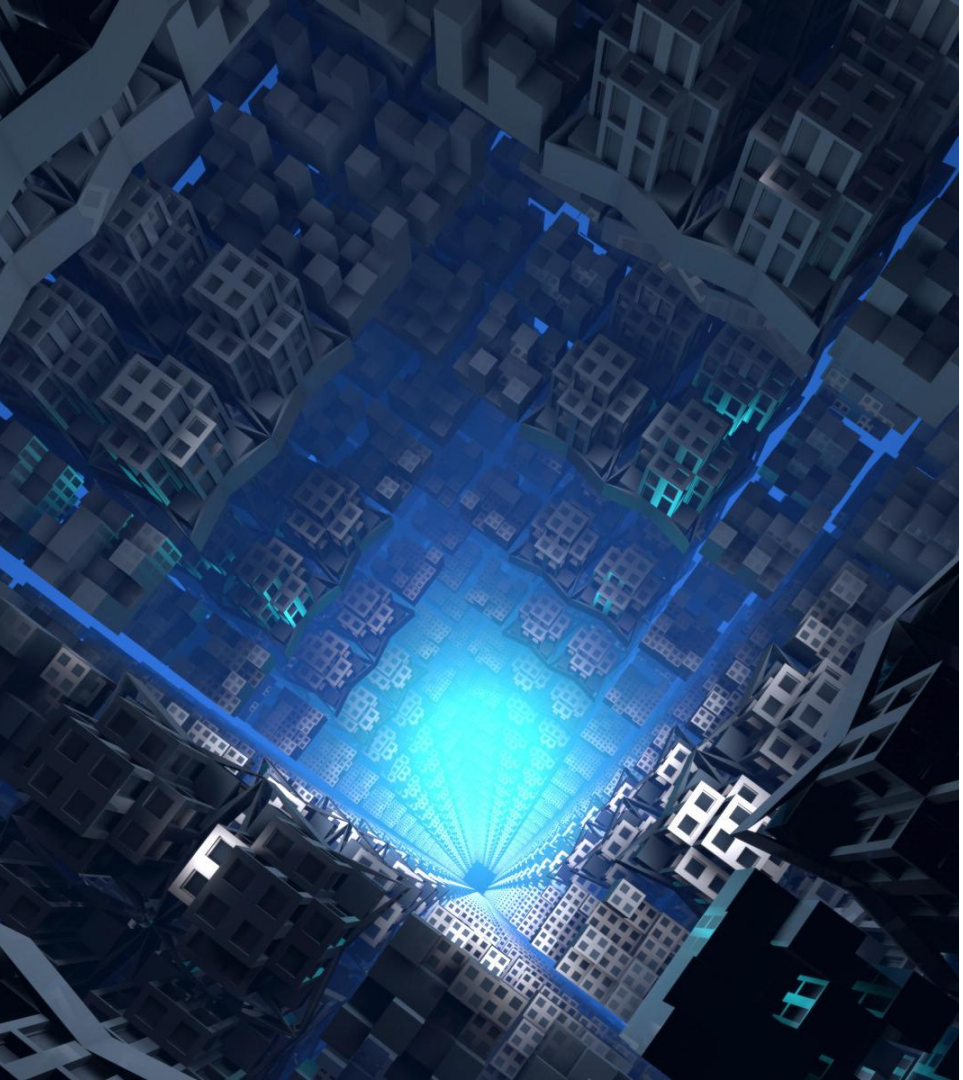

Earclip Final Design

Features of Varna

Varna allows the user to set various controls about speech synthesis
And supports the following:

Fundamental Pattern
Control Mode Settings
- Text Generation
- Speech Control
- Synthesis Control

All the features will be demonstrated and explained in the following slides



Fundamental Pattern

Allows the user to switch between any two out of the 10 control modes via a 1-3 bit pattern unique to the mode.

Control Setting Modes:

001 1 Takes the user to the inbuilt sentences (61)

002 2 Allows the user to generate a number

011 3 Takes the user to word database (61)

012 4 Sets speech controls

021 5 Generates sound tones

022 6 Generates words using alphabets

022 7 Stops current synthesis

111 8 Pauses current synthesis

112 9 Resumes last synthesis

122 10 Prints the current status of the device in hexadecimal

Text Generation

001 1 Takes the user to the inbuilt sentences (61)

002 2 Allows the user to generate a number

011 3 Takes the user to word database (61)

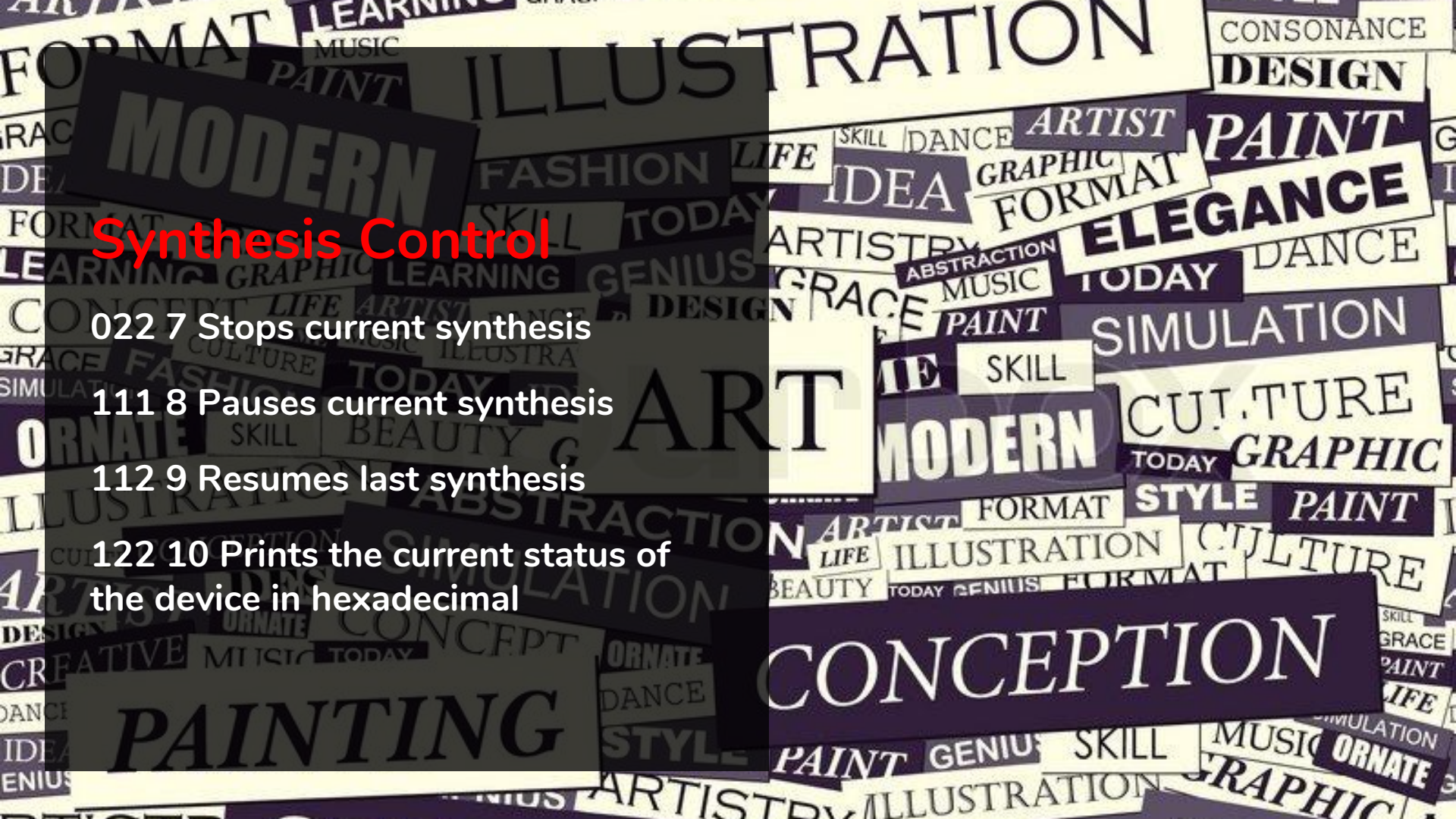
022 6 Generates words using alphabets

Speech Control

012 4 Sets speech controls

- Volume Control
- Speed Control
- Tone Control
- Voice Type Control

021 5 Generates sound tones


Synthesis Control
022 7 Stops current synthesis
111 8 Pauses current synthesis
112 9 Resumes last synthesis
122 10 Prints the current status of the device in hexadecimal

Remarks

The project is inspired by the alternative communication device, “TALK” developed by Arsh Shah Dilbagi as a tool of assistive communication.

➔ **Code**

Will be uploaded on github after final iterations soon. Documentation can be referred for more technical details, videos and plan of action.

➔ **What’s next?**

There still lies scope for improvement in terms of code efficiency, adding features and making the device more handy and easily portable.