

Introduction

- Social robots are a new kind of robot that is specifically designed to interact and form emotional bonds with humans.
- This project proposes a new process and framework to design a social bot, namely UNIverse, to support the MZ Gen's emotional well-being.
- We will develop a process and framework to build a social robot and blueprint its user experience. Then, we will prototype one or two most significant features/interactions using the TinyML approach to demonstrate our potential.

Research Purpose

- Understand the basic elements of human-robot interaction (hri) and design the concept of a robot that helps emotional well-being through the robot.
- Understand the methodology and principles of UI/UX design based on human natural languages such as voice user interface (VUI) and design natural interactions between users and robots.
- Implement a social robot that responds to the user's voice signal based on the designed concept and interaction using the Arduino board and TinyML.

Research Method

- Literature research method for social robot design from the perspective of HRI and VUI.
- User Scenario method to describe user experience based on user needs and Wants
- Use Case/Task Flow Method, which designs the main requirements required for development in User Scenario.
- Rapid Prototyping method to make and test key functions as fast as possible.

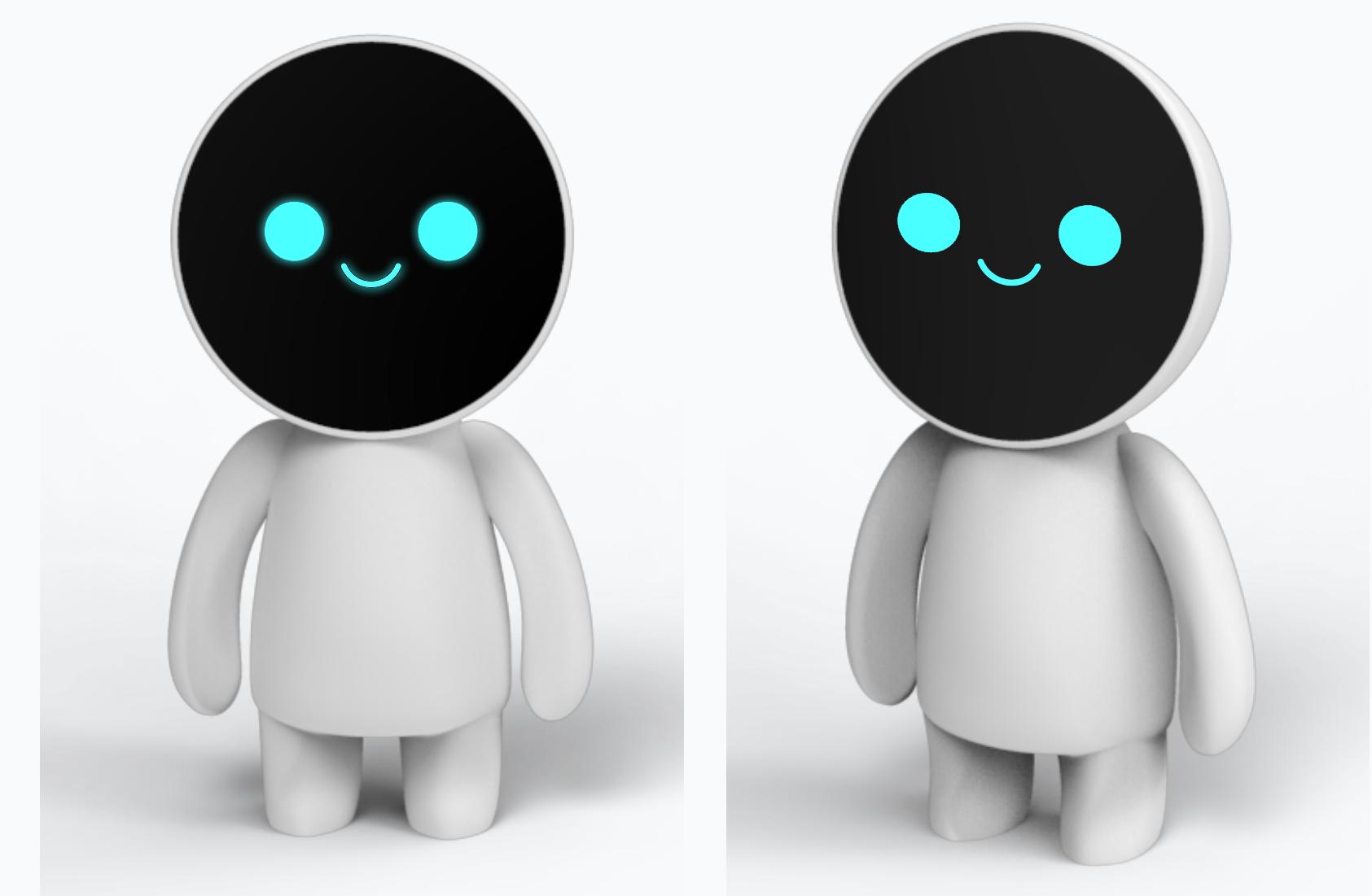
Research Schedule

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|-------------|--|
| Aug. | Understanding HRI, VUI and Arduino environment/ Concept design |
| Sep. | Making various user scenario/ Design a task flow. |
| Oct. | Design robot appearances and facial expression. |
| Nov. | Implementation of robot function. |
| Dec. | Making a demo and final report. |

Research Outcomes

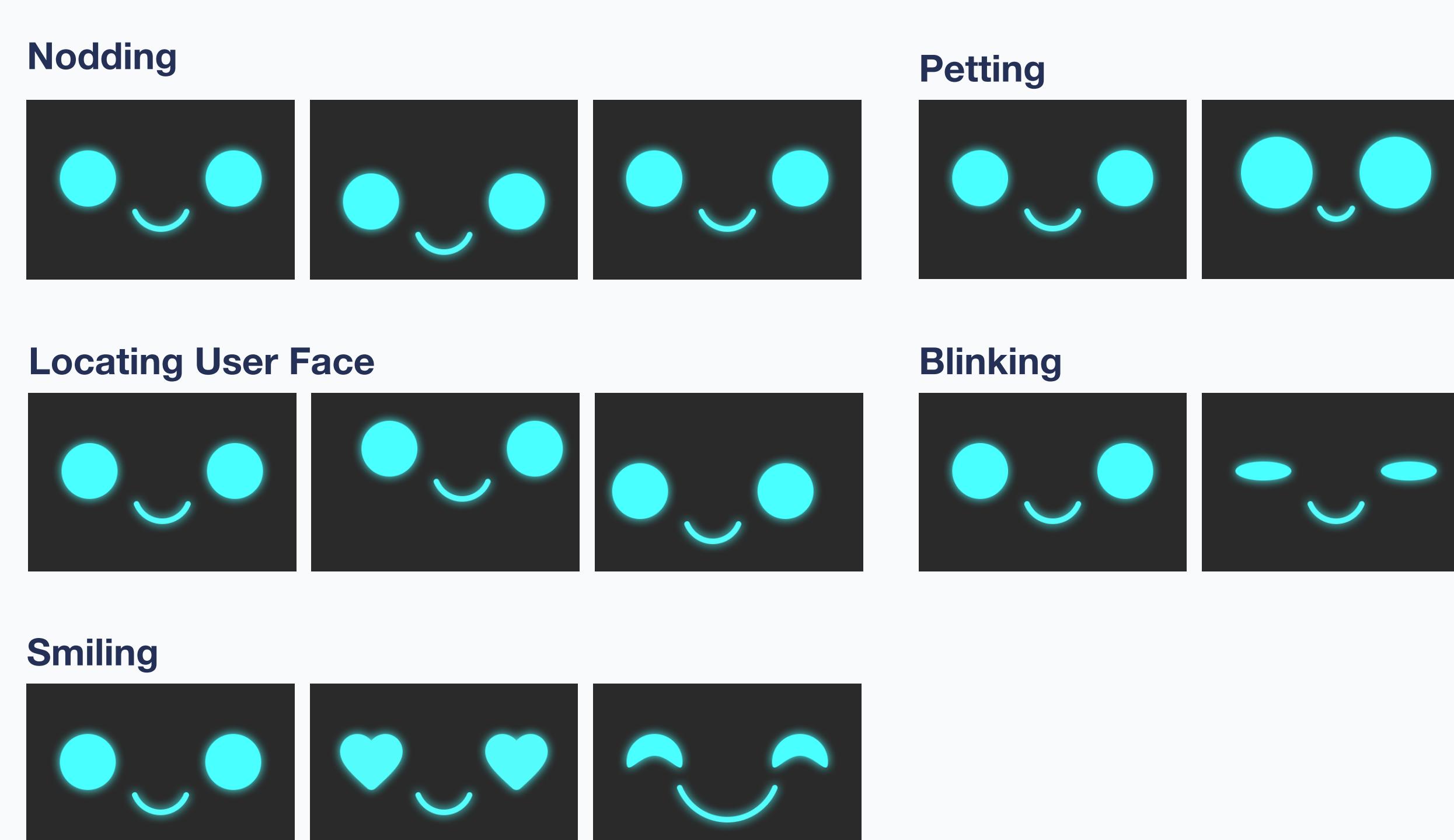
Product

Unlike the existing social robot, the character shape is designed with a friend feeling that can give a companion feeling. Organic and rounded shapes invite the user to interact with the robot.



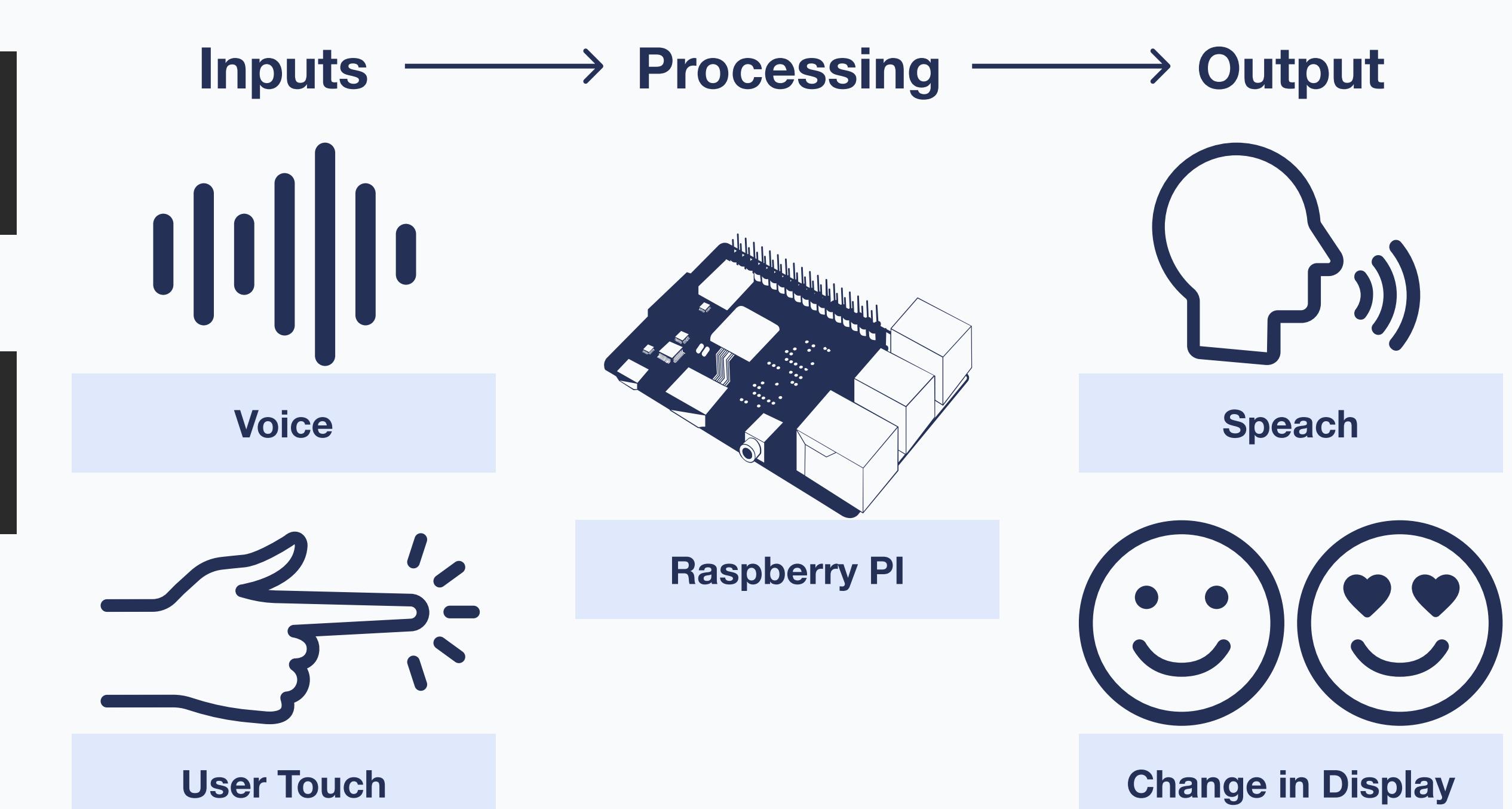
User Interface

Through the Figma prototyping tool we have designed and animated 5 types of the robot face expressions. Round shapes were used for the robot face to give it friendly appearance.



Software

Kakao Voice API was used to build a simple Voice User Interface(VUI) through Speech-to-Text (STT) and Text-to-Speech (TTS). Touch mechanism is working on Python and Raspberry Pi environment



User Scenario

- The user can talk with robot and ask questions. The robot can tell its name, whe it was born as well as change its face expressions.
- User can ask the robot to play a song/stop a song. The robot will play UNIVERSE by Coldplay and BTS and nod when it understands the user command.
- User can pet the robot. As a response, robot will change display to excited expression.

