SUSI GENE: a portable robot as venting, recording and sharing tool for improving mental health condition

Mental health condition is a major challenge throughout the world, yet mental health services in many countries are struggling to meet such needs. Studies have shown innovative intervention can have positive impacts on patients' mental health conditions. This paper presents SUSI GENE, an egg-shaped portable robot, designed for people with mood disorders, including major depressive disorder, bipolar disorder, etc. Through interactions, SUSI GENE attempts to help patients increase their self-awarenesses, vent their emotions, face their inner conflicts, and reappraise their problems in a less negative approach.

CCS Concepts: • **Human-centered computing** → **User interface design**; *Sound-based input / output*; • **Social and professional topics** → **People with disabilities**; • **Hardware** → *PCB design and layout*; • **Applied computing** → **Consumer health**.

Additional Key Words and Phrases: datasets, neural networks, gaze detection, text tagging

ACM Reference Format:
. 2020. SUSI GENE: a portable robot as venting, recording and sharing tool for improving mental health condition. 1, 1 (September 2020), 2 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 BACKGROUND

Mental health conditon, which causes the most Years lost of Desiabilities(YLD) in the whole world (ref), is influenced by many factors. According to Monroe and Simons' model, these factors can be concluded as diathesis (predisposition/vulnerability) and stress (triggers). The model assumes every individual, no matter of what innate diathesis, has possibilities to develop mental health conditon under certain amount of stress. Thus, the proper react mechanism to the event of stress is the main method to reduce individual's possibility of mental health conditon. Based on the interview of 11 subjects who suffer from mental disorder, we locate two mechanisms: low-recognition of stress-caused emotion changes, and emotion-driven social isolating as the most notable improper ones that may raise the possibilities of mental health conditon and continuely worsen when the mental health condition becomes severe. Recent research and products provide solution by replacing the communicate subject from human to artificial inteligence. However, there is little interactive solution focusing on changing these two mechanisms by guiding the individual to apply new actions to increase diathesis. Therefore, we designed SUSI: an robot with tangible interface to help users shadowing their stress event and related emotion changes through oral expression and generate gamificated communication material to share in real-life relationships.

Author's address:

2 INTRODUCTION

Mental health condition is a major challenge throughout the world, yet mental health services in many countries are struggling to meet such needs. Studies have shown innovative intervention can have positive impacts on patients' mental health conditions. This paper presents SUSI GENE, an egg-shaped portable robot, designed for people with mood disorders, including major depressive disorder, bipolar disorder, etc. Through interactions, SUSI GENE attempts to help patients increase their self-awarenesses, vent their emotions, face their inner conflicts, and reappraise their problems in a less negative approach.

3 HARDWARE DESIGN

SUSI Gene is an egg-shaped portable robot, its dimensions are 100 mm in diameter and 50 mm in height. The SUSI Gene prototype is comprised of three main hardware components: the main PCB with an Arduino NANO BLE Sense and other necessary components on it, a battery, and a 3D printed shell.

SUSI Gene is powered by a 450mAh 2S 7.4V LiPo battery. Most of the power in the robots are consumed by the LEDs and Arduino. The current draw is approximately 200 mA during typical use. Thus, with a 450 mAh battery, SUSI Gene is capable of working for about 2 hours without NFC wireless charging.

SUSI Gene is illuminated in RGBW using WS2812B which are wrapped inside the 3D printed enclosure to provide the robot's state display as well as full color indicating.