
Bubble Talk: Open-source Interactive Art Toolkit for Metaphor of Modern Digital Chat

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Abstract

In this art project, the ephemeral and intangible aspects of human's communication are represented by soap-bubble. The shapeless, intangible, and insubstantial speech - once the speech is shouted out through speaker's mouth it disappears unless someone hears it immediately, or even it is heard, the message will be forgotten as time goes - is transferred to a semi-tangible yet still fleeting bubble. The bubble machine that we created provides person-to-person and person-to-space interaction. The machine has a iris mechanism that varies its outlet size reacting to the participant's speech pattern as if it tries to talk something. Once the participant pauses, the machine blows out various sizes of bubble. The floating bubble represents the subtle state of a message from interpersonal communications that lies in the middle of real and digital world. Also, it creates a certain delay until it pops, which is a metaphor of our behavior that we often delay to send out text-messages through chatting apps. We believe that anyone can be an artist. By open-sourcing the details of fabrication process and materials, we want to encourage people to build the machine, interact with it at any locations, and use and modify it as a art tool for realizing their own ideas whether it is for art or not.

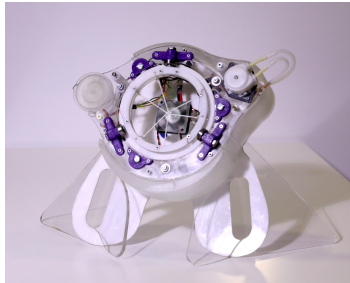


Figure 2: Open-source Art Toolkit, Bubble Talk machine. At the installation site, three machines will be exhibited; two for two people interaction and one for a mobile interaction



Figure 1: Installation view of two BubbleTalk machines for two people interaction, and mobile interaction for one person

CCS Concepts

•**Human-centered computing** → **Sound-based input / output**; *User interface toolkits*; •**Applied computing** → **Media arts**; •**Hardware** → Sound-based input / output;

Author Keywords

Interactive Art; Ephemeral; Bubble; Voice; Open-source

Introduction

Bubble

*"quod, ut dicitur, si est homo bulla, eo magis senex
(for if, as they say, man is a bubble, all the more so is an old man) "*

- Marcus Terentius Varro (116 BC - 27 BC), *De Re Rustica*

A soap bubble is ephemeral. It lasts only for a brief moment and quickly disappears even by a light breeze. The bubble's

symbolic meaning as a metaphor of human's fragile and insubstantial life was first coined by a Roman writer Varro in the 1st century BC. Also, in 1572 the philosopher Erasmus reintroduced the Latin expression "Homo bulla" ("man is a bubble") in his collection of proverbs, *Adagia* [3]. This special characteristics of bubble attracted lots of artists in 17th century and also other periods, and were used in *Vanitas*, a type of symbolic work of art showing the transience of life, the futility of pleasure, and the certainty of death [10]. A paint, 'Cupid Blowing a Soap Bubble (1634)', by Rembrandt Harmensz van Rijn is one of examples. Metaphor of bubble continues to the modern century and a modern artist, Thomb Kubli, also uses bubbles as a media to transfer invisible and intangible sounds to visible but fleeting form in a 3D space [4]. The attractiveness of bubble might be coming from its ironical representation of our transient life which reminds us of the value of our existence at a moment and makes us seize the present. The usage of bubbles is



Figure 3: From closed position to open position of string iris mechanism (From top to bottom). As it open, the 3 lines of string form a triangle shape with bubble membrane.

not only seen in the art field but also in the field of HCI. The unique materiality of bubble has intrigued researchers to explore a new design space of user interfaces, and also challenged them to technical problems to handle and create bubble. Thanks to those investigations, bubble has been used for playful and emotional engagement [8], [1]. Also, it has been applied as a tangible interface that contains and delivers fragrances [7], [5].

Speech

Later in the 18th and 19th-century, the connection between bubbles and their fleeting life become more a motive of parody and it is possible to find many sketches of political satire, from this period, representing bubbles as speech of a politician (meaning something nice but with short life) a tradition that lasted until the 20th-century [6]. Also, a word and shape of 'bubble' were used as a graphic convention describing a imaginary form of speech and thought of characters in comic books.

Inspired from those metaphors of bubble, we propose an interactive art project representing the ephemeral and intangible properties of human's communication. Once speech is shouted out from a speaker, the sound of speech never lasts and it lost its meaning unless there is a listener. Even if the speech is heard by someone, the message will be forgotten as time goes. The shapeless, intangible, and invisible speech is transformed into a semi-tangible yet still insubstantial form of visible bubble. To present this art concept, we created a bubble machine that provides person-to-person and person-to-space interaction. We designed the machine which does not show any intention of bubble machine so that no ones can expect what the purpose of the machine is until they interact with it. The machine has a iris mechanism that varies its outlet size reacting to the participant's speech pattern as if it tries

to speak something. Once the participant pauses, a fan inside of the machine generates airflow toward a bubble membrane created on the iris outlet and transforms it to various sizes of bubble. The floating bubble represents the subtle state of a message from interpersonal communications that lies in the middle of real and digital world. Also, it creates a few seconds of delay until it explodes, through which we like to say that it is never possible to have a real-time synchronized communication between two people even in a same space due to the limit of human perceptions. Also, the delay means our behavior that we often intentionally use a delay before sending out text-messages through chatting apps. We share all the details of fabrication process (<https://www.instructables.com/id/Bubble-Talk-Turn-Your-Speech-Into-Bubbles/>) and materials (<https://goo.gl/XJqqoi>) so that everyone can be involved to the part of the art installation from their own places. We like to invite all to be an artist through playful interactions.

Open-source Art Toolkit

"Art is anything you can get away with."
- Andy Warhol

Through this project, we deliver a message that art can be accessible to anybody from anywhere. We hope that the instructions of fabrication and material make people access to this interactive art installation in their home as well so that not require them necessarily to visit the specific art exhibition place. Also, by inviting them to be engaged to the fabrication process, which is the first start point of the art installation, we wanted make them feel being an artist, and inspire them to use it as a tool for their idea realization whether it is art-oriented or engineering-oriented.

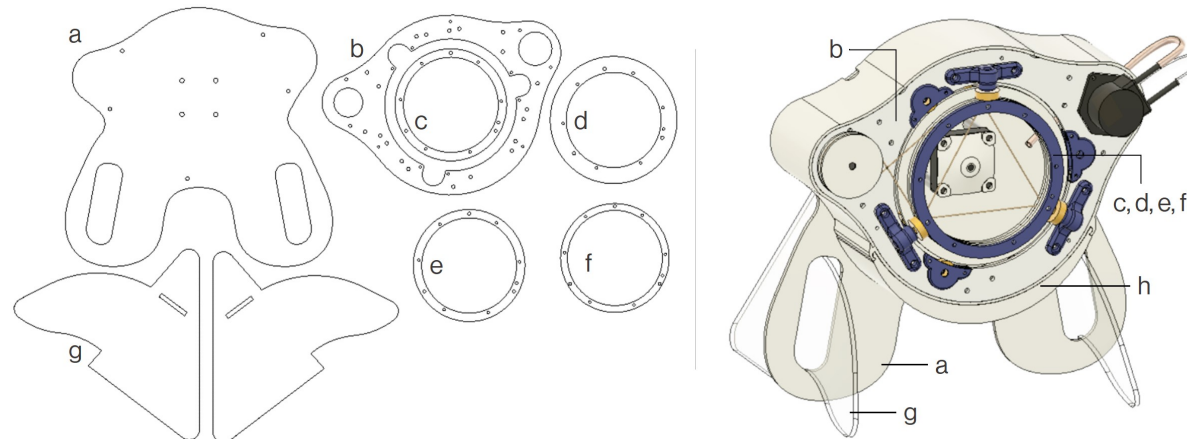


Figure 4: CAD model of Bubble Talk machine and drawings for laser cutting. (a) Back plate (b) Front plate (d), (e), (f) Iris rings (g) Support jigs (h) Soap liquid container

Mechanism

We wanted to design the machine that can create the surprising moment of audiences by making them hard to guess what the machine does. We did not want to make it looking like so obviously telling "I am ready to blow out bubbles." To let the machine itself can be a kinetic sculpture even without the soap liquid, we built a iris mechanism inspired by the prior work of giant bubble machine [2] which used a CNC machine and metal sheets. We modified it to have a mobile form factor and easy to fabricate using acrylic sheets and 3D printing. By using a string to create a soap membrane, the installation itself provides visual entertainment to audiences. As a servo motor rotate, the string attached to the servo's pulley, the iris made of 3 strings open and close 3. When it fully open, the iris forms a triangular shape with the maximum surface area of soap membrane. The peristaltic motor pump provides soap liquid and make

the strings wet when the iris close. As the iris opens, the wet strings create a triangular soap membrane and a fan with a nozzle behind the membrane blows it to create and blow out bubbles. The machine's structural frame (Fig. 4, a) allows the user to hold through its two holes on the leg, and also place on flat surface adding support jig (Fig. 4, g) to the holes.

Fabrication

To meet the purpose of an art toolkit for everyone, we tried to use easily accessible material and fabrication tools. we laser-cut a acrylic sheet to create a structure of the Bubble Talk machine as shown on Fig. 4. Other parts that requires strength and certain 3D shapes are 3D printed using a customer level filament-fused or stereolithography 3D printer. For a bubble soap liquid, we followed the Mike's Goopy Mix recipe [9] using baking powder and dish washing liquid. Detailed instruction for building the machine is shared on

the link ¹. Bill of material, schematics of frames for laser cutting, and STL files for 3D printings can be found in the following link ².

Interactions and Installation

Person-to-space

The bubble machine can be held and mobile as described in the previous section. For a person-to-space interaction, we allow a participant to grab the machine and move around the exhibition space freely (Fig. 1, right). As he/she is walking around and talking through the machine, it generates bubbles leave them behind of the participant along a line of his/her path.

Person-to-person

As shown on the left of Fig. 1, for two people interaction scenario, two Bubble Talk machines can be put on a table facing each other and requires two participants in front of the each machine. Whenever the participant starts to speak to a microphone attached to the back-side of the machine, the iris constantly opens and closes based on the pitch of the voice, which looks like the machine itself tries to talk something having a mouth as iris. Once there is a certain pause of the speech, a fan inside of the machine blows the bubble membrane and create a bubble floating in the mid air. Two people's interactions with the machines create a scene for other audiences that looks like the real world version of digital chatting. The bubbles from the individual machine can meet together and be merged into one bubble or disappeared.

¹ <https://www.instructables.com/id/Bubble-Talk-Turn-Your-Speech-Into-Bubbles/>

² <https://goo.gl/XJqqoi>

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