Specs

Materials: silicone rubber, paper, spandex, acrylic sheets

Tools: air compressor, vacuum, laser cutter, 3D printer

PneUI

An elastic pneumatic interface takes its cues from living things.

Describe what you made.

Our project is called PneuUI. It includes a series of pneumatic (inflatable) artifacts and interfaces. They are transformable and responsive objects, such as a lamp that can wrap its own body when pulled, a transformable iPad cover that inflates bubbles when players of racing games need to turn left or right, and a cellphone that turns into a wrist band. Technically, we

envision a future material with an embedded grammar that can sense and transform, either through geometrical or structural computation.

Briefly describe the process of how this was made.

We see the fabrication process as not only a labor procedure, but also a process to embed computation inside materials. Soft lithography has been used by soft roboticists, biologists, and

other scientists to fabricate elastomers with micro-scale air channels. We have adapted this process, enlarged the scale, and combined it with traditional molding and casting methods to fabricate our pneumatic artifacts.

What for you is the most interesting thing about what you made?

We started with making new actuators, but it turned out

that we wanted to create the feeling of artificial life. We think the elastomeric pneumatic actuators go far beyond generating bending curvature. The unique physicality of translucent silicone rubber and the natural transformability of inflatable structures convey a type of motion and form factor that resembles or reminds us of life.

What was the biggest

→ Lining Yao is fabricating the PneuUI lamp, a shape-changing object that can morph from a single strip into an energy-saving bulb shape.

→ The PneuUI lamp.

surprise in making this? Surprisingly, and a bit strangely, we feel like we are developing a unique relationship with the materials we are working with. They are like your pets. They have their personalities and unexpected behaviors. In order to let them achieve the performance you hoped for, you need to really invest

time, patience, and passion into interacting with them, trying everything you can think of to play with them.

What is the one thing about making this that you would like to share with other makers? Try to minimize errors from the very beginning. You thought you just wanted to try out something quick, so instead

of milling or 3D printing a proper mold, you just laser cut and glued a mold with a thin, heat-distorted acrylic. And of course you will fail in this experiment. Then you realize the quick failure has prevented you from going down this route and spending more time on it. But the possible truth is the failure might be only in the accuracy of your fabrication, and you

have just missed a chance to create a great invention.

As told by Lining Yao, Tangible Media Group, MIT Media Lab

Project Members: Lining Yao, Ryuma Niiyama, Jifei Ou, Sean Follmer, and Hiroshi Ishii, Tangible Media Group, MIT Media Lab

<http://tangible.media.mit.edu/project/pneui-pneumatically-driven-soft-composite-material/>

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→ Jifei Ou is fabricating the multi-state air bladder. Bubbles can grow on bubbles; balloons can grow on balloons.

→ Multi-state texture samples with different cut patterns.