

Rapid-prototyping Idea_1

Instant Cave Space Maker

System Components



Inflatable units with compressed-air enclosed by stretchable membrane



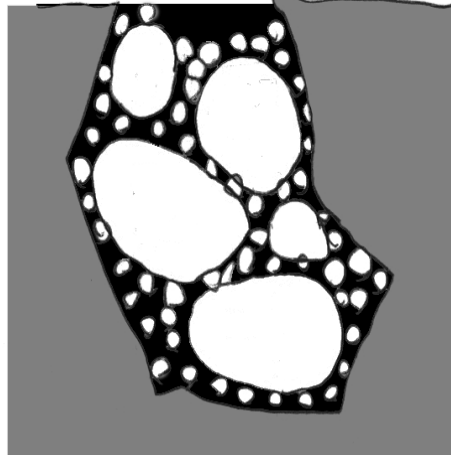
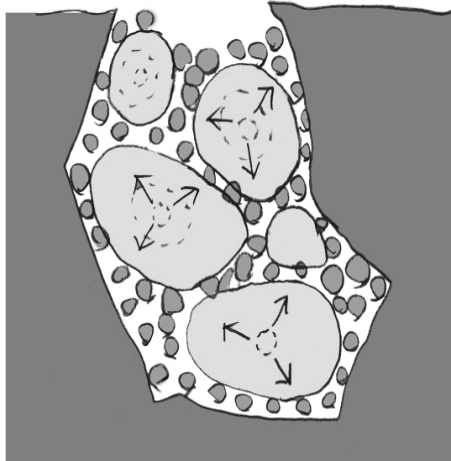
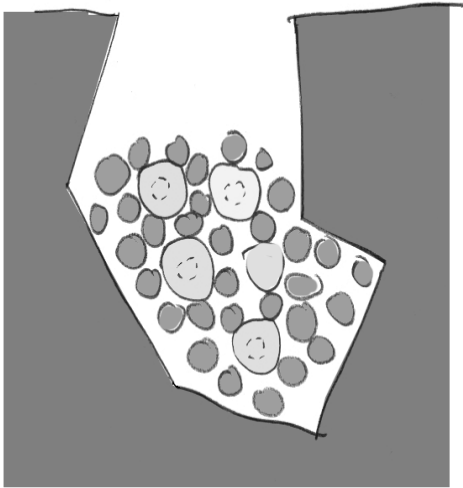
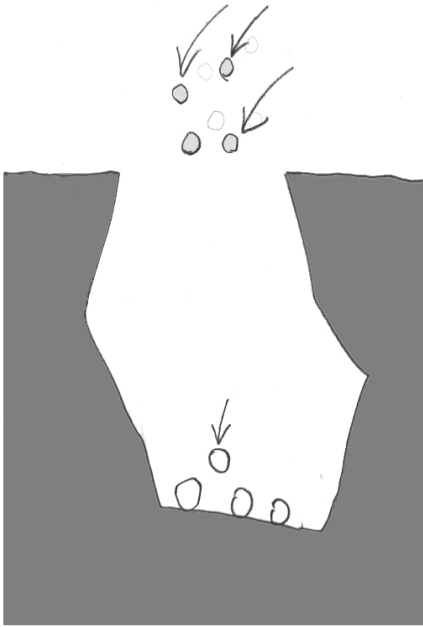
Solid high-strength-plastic units which eject fluid that can solidify later around the inflated units.

Creates enclosed space for temporary use instantly without precise planning.

Presumably useful when you do not have a precise control. (Maybe in Mars.)

Components are not re-usable.

No feedback.



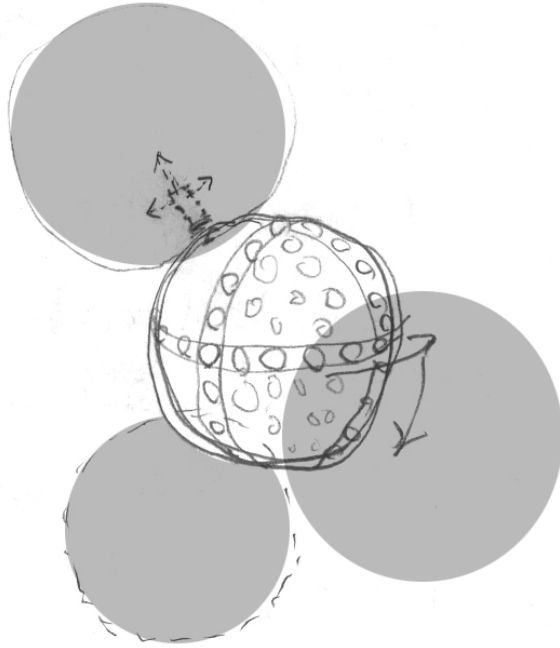
Rapid-prototyping Idea_2

Reconfigurable Units Idea

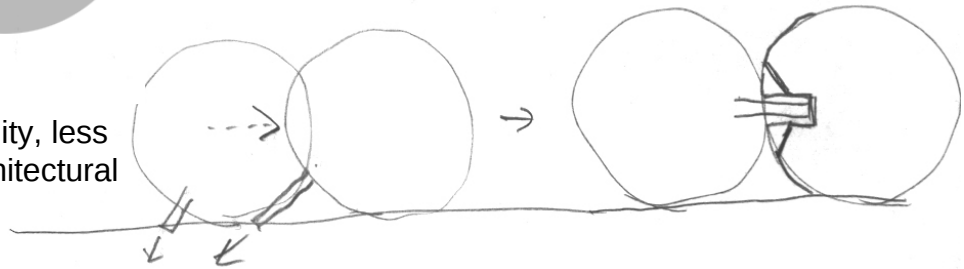
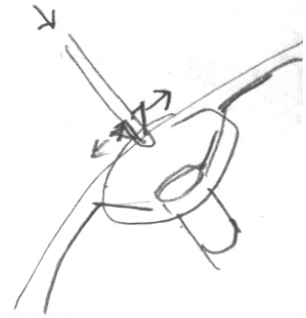
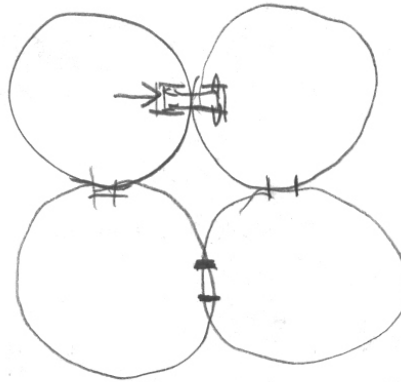
Self/coded/algorithmic assembly

Spherical unit with multiple joint locations with higher tolerance for joint.

Units can move and rotate to change configuration.

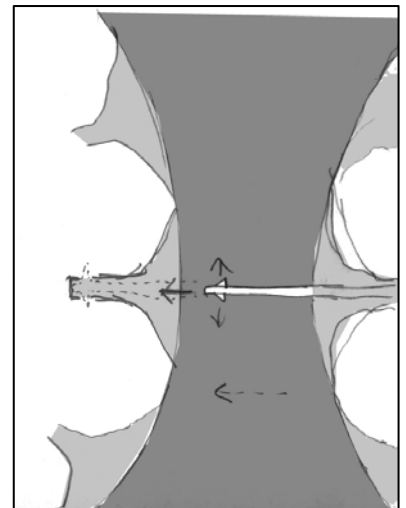
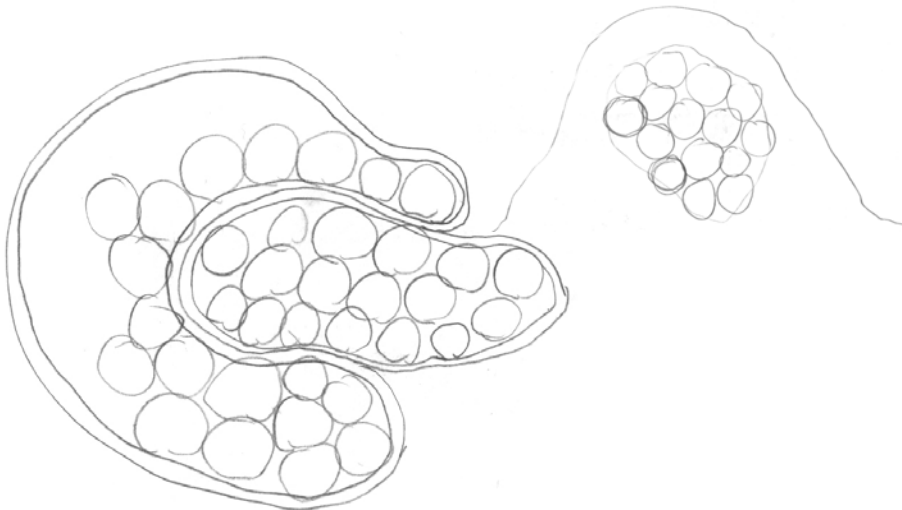


Spherical shape: better mobility, less functional and usable for architectural space.



Move or hope using shaft for joint

Multiple Joints has greater tolerance by flared openings



Idea_1

-what process(es) will it use?

Casting/shell can be 3d printed

-what will (and won't) it be able to do?

Create enclosed space.

Components are not re-usable. Not adaptable. No feedback.

-what are the benefits (and disadvantages) over current practice?

Faster construction. (when it is hard to gain precise control for construction. For space expedition?)

-which parts exist, and which will require development?

High-strength plastic is used for some slab construction with concrete (bubble-deck)

Injectable material and stretchable membrane need to be researched.

- what will the workflow be from design to output?

Material research to production

- how much will it cost?

- how fast will it be?

-what consumables will it need?

Idea_2

what process(es) will it use?

shell can be 3d printed

what will (and won't) it be able to do?

Reconfigure themselves to desired configurations.

what are the benefits (and disadvantages) over current practice?

More adaptable to unknown usages.

Spherical shape for the units may not be desirable for spatial use.

which parts exist, and which will require development?

Presentations from previous classes shows 2 reconfigurable units.

what will the workflow be from design to output?

Design of the components. 3d-printing of the parts. Assembly.

how much will it cost? what consumables will it need?

Microcontroller \$50-150

Batteries \$10

Sensors \$10

Actuators (Servo) \$10-100 **Per unit**

how fast will it be?