THE PROBLEM

Individuals who are blind and/or visually impaired have no effective way of interacting with 2D visual information. Some of this information can be easily communicated with language vocally or using braille text, but some information is inevitably lost.
BACKGROUND

Braille indicates that touch can be used to communicate complex information.

There are tactile image guidelines & best practices:

◆ Avoid clutter
◆ Use labels intelligently
◆ Eliminate irrelevant information
◆ Proofread with your fingers
HOW CAN WE TACTICALLY PORTRAY THE VISUAL INFORMATION IN AN IMAGE?
SMOOTHING

QUANTIZATION

Remove sharp features

Extrude

Reduce number of intensity levels

LESSONS

➔ Extrusion based on color intensity produces height maps which are not tactically meaningful
➔ Complex images get lost
➔ Scale required for representation can be difficult to use
LESSONS

→ Detailed images need high resolution of circles
→ Unclear if image can be perceived with touch
→ Appears that depth is more easier to perceive than size variation
LESSONS

- Highly abstract, easy to generate
- But, what is the value? How does this aid or inform someone?

High gradient/salient edges

Extrude

Dilate for printability
IS THERE A TYPE OF IMAGE THAT FITS THIS APPROACH BETTER?
EDUCATIONAL DIAGRAMS

Simple diagrams are often used to help students create a mental model of concepts that are difficult to understand without the visual aid.
THE DIAGRAMS

Mercury  Venus  Earth
Mars  Jupiter  Saturn
Uranus  Neptune  Pluto

SERIES
Battery  Lamp  Lamp

PARALLEL
Battery  Lamp  Lamp
THE SOLAR SYSTEM
THE CELL
THE CIRCUIT
EDUCATIONAL APPLICATION
The representation of complex images in a manner that aids perception proves to be very difficult whereas trying to replicate a simple diagram is very efficient.

➔ Are there additional educational illustrations or diagrams that can be represented using this manner?

➔ Can we begin to use texture or material to add depth or reality to these diagrams?

➔ Is there a way to simplify the complex images in such a way it reads as a diagram? Or in those cases simply using braille or voice is more effective?
Thank you!
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Tests

Scale required for perceiving gradient variation

Depth vs size
Etching

Resolution vs perception