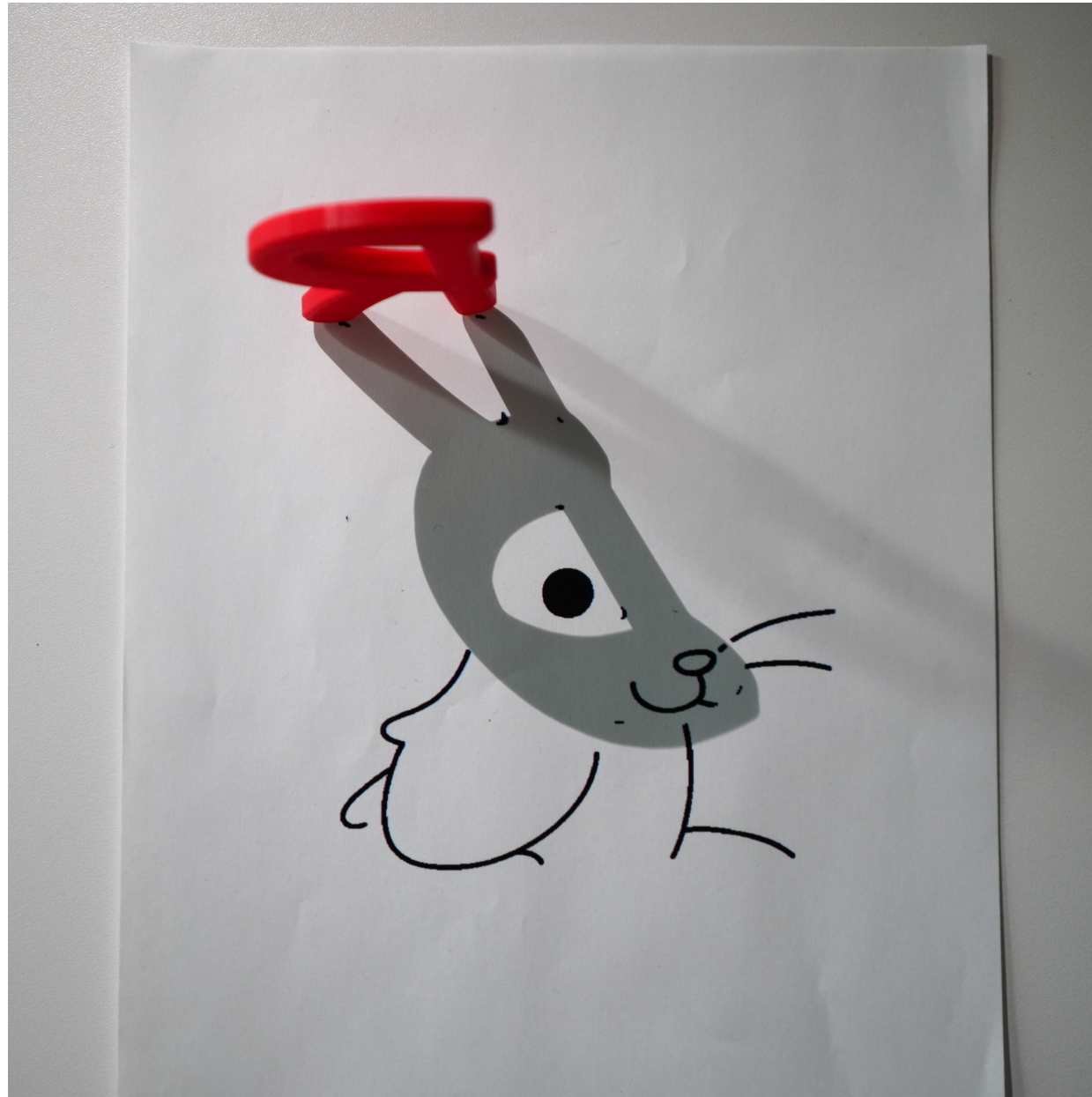


What is this?



R

3D alphabet 'R'



Turn Everyday Object into Shadow Art



A (very ordinary) household scrub brush



Turn Everyday Object into Shadow Art

Given



Arbitrary 3D Object

, our system predicts two things



Turn Everyday Object into Shadow Art

Given



Arbitrary 3D Object

, our system predicts two things:

Object Pose
+
Lighting Position

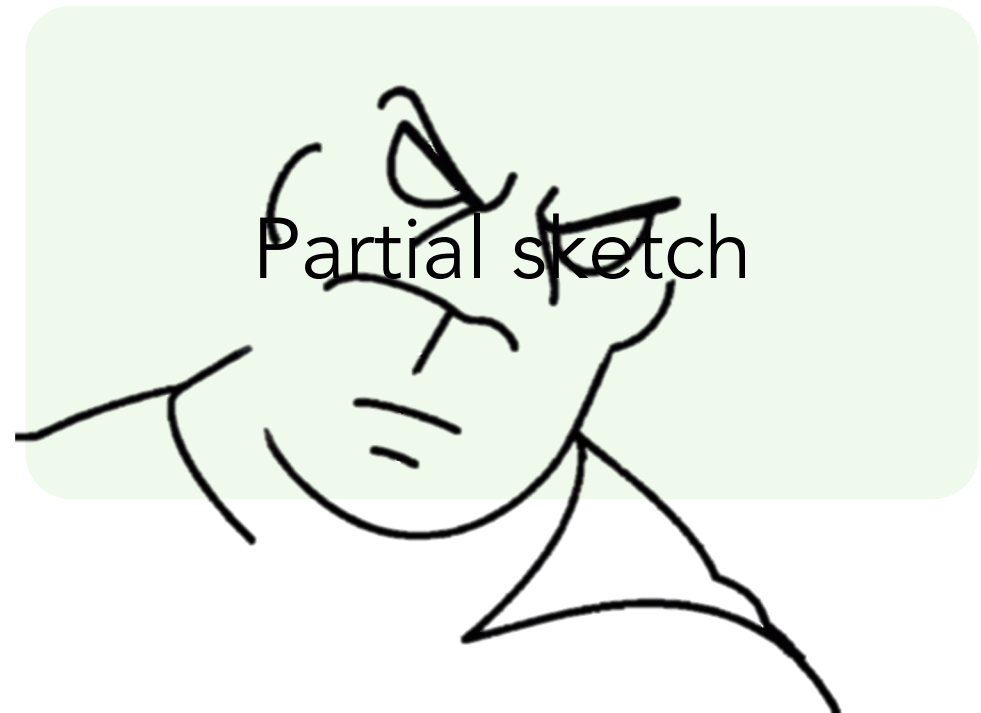
Partial sketch



Turn Everyday Object into Shadow Art



Arbitrary 3D Object



Turn Everyday Object into Shadow Art



Arbitrary 3D Object



Vincent Bal's *Shadowology*



https://www.instagram.com/vincent_bal/



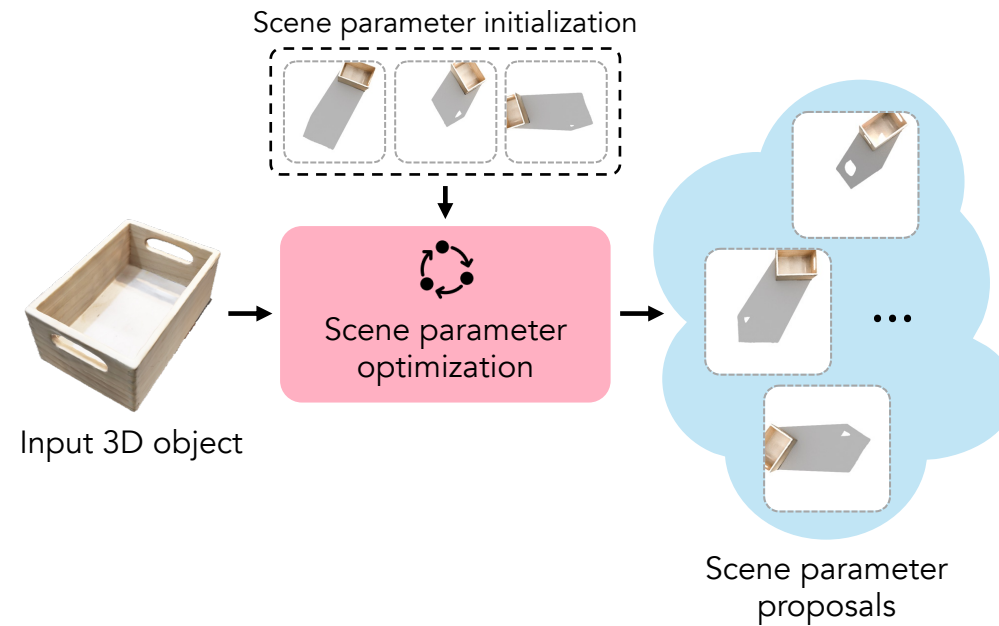
Make Everyone an Artist



Trace the **generated** sketch



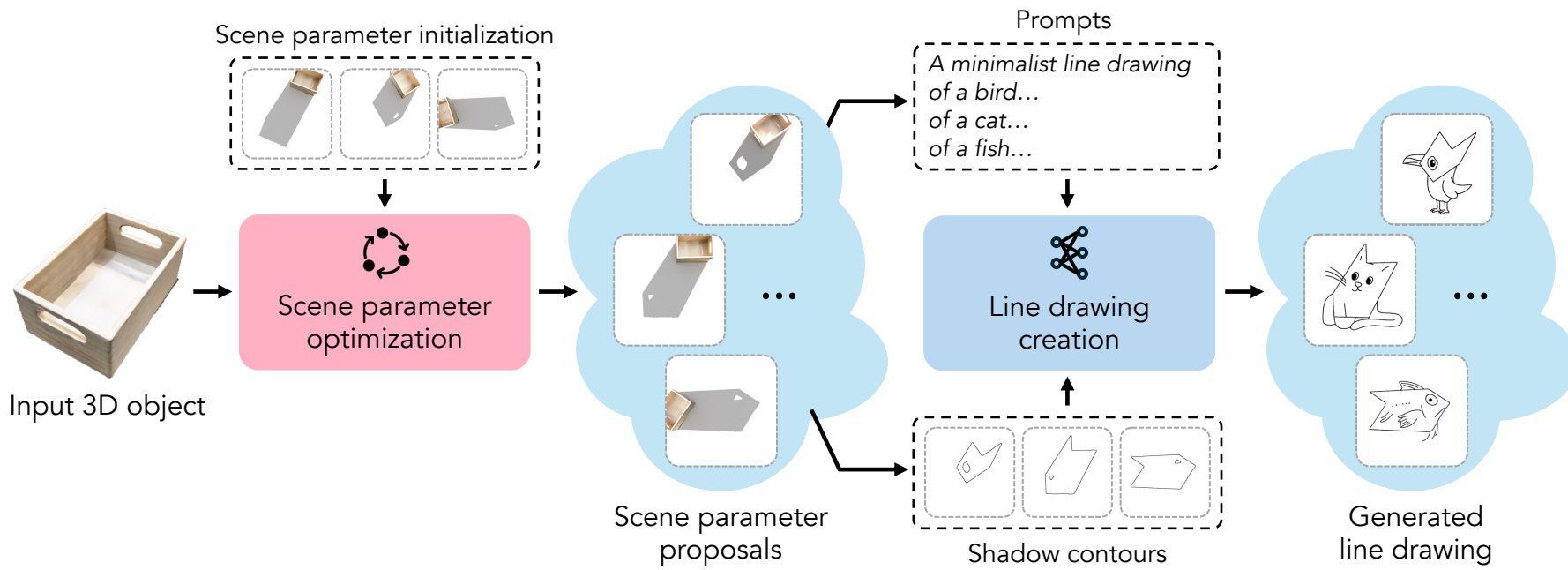
Framework



Where to put the object and light?



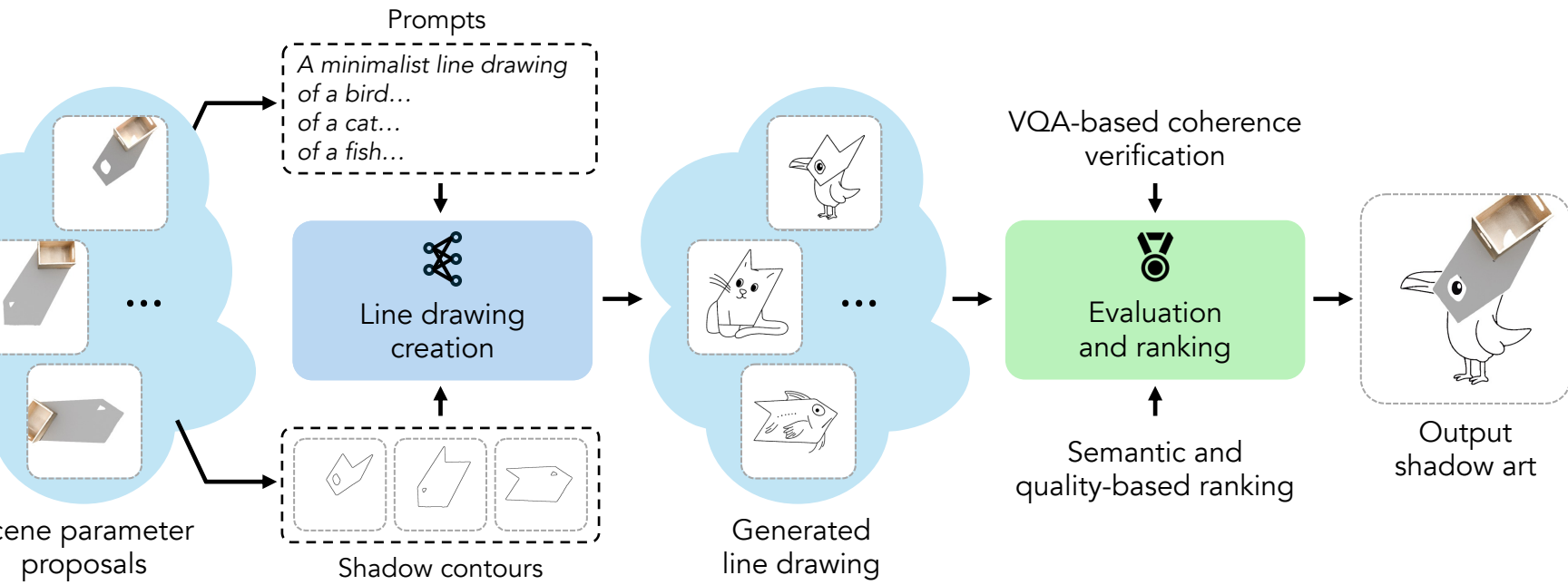
Framework



What to Draw? How to Draw?



Framework



Quality Control



Where to put the object and light?

- A good shadow should be *irregular, expressive, etc.*
- Measure with *fractal dimension* (differentiable)



Fractal Dim: 1.65



Fractal Dim: 1.60



What to Draw?

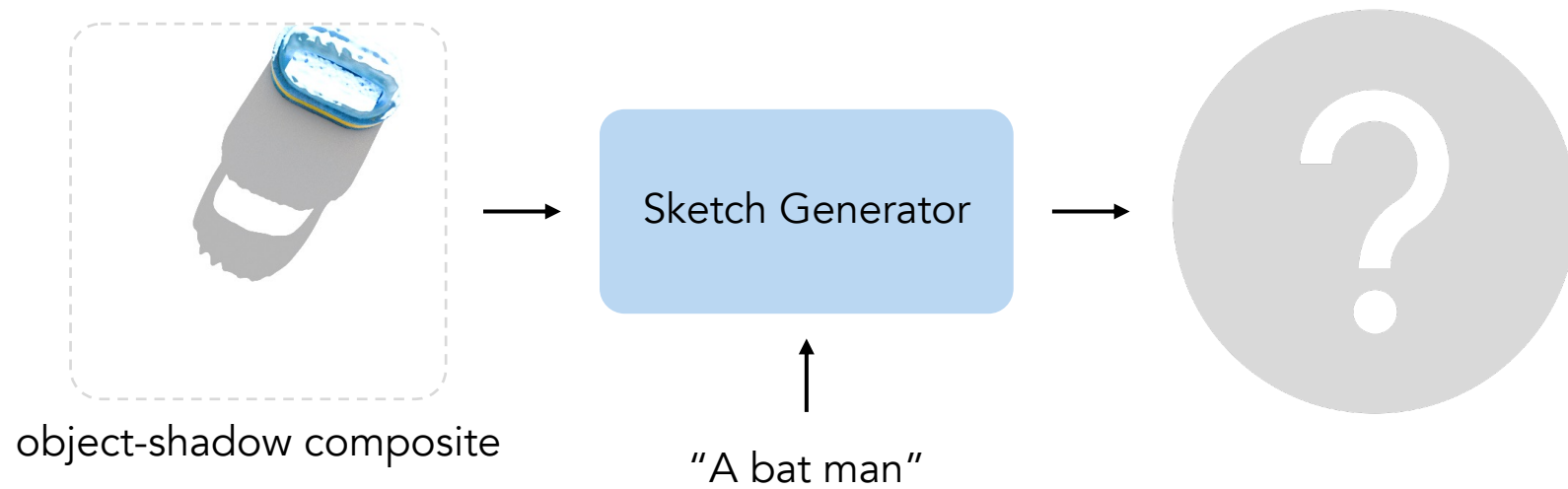


Instruction &
In-context examples

"A bat man"

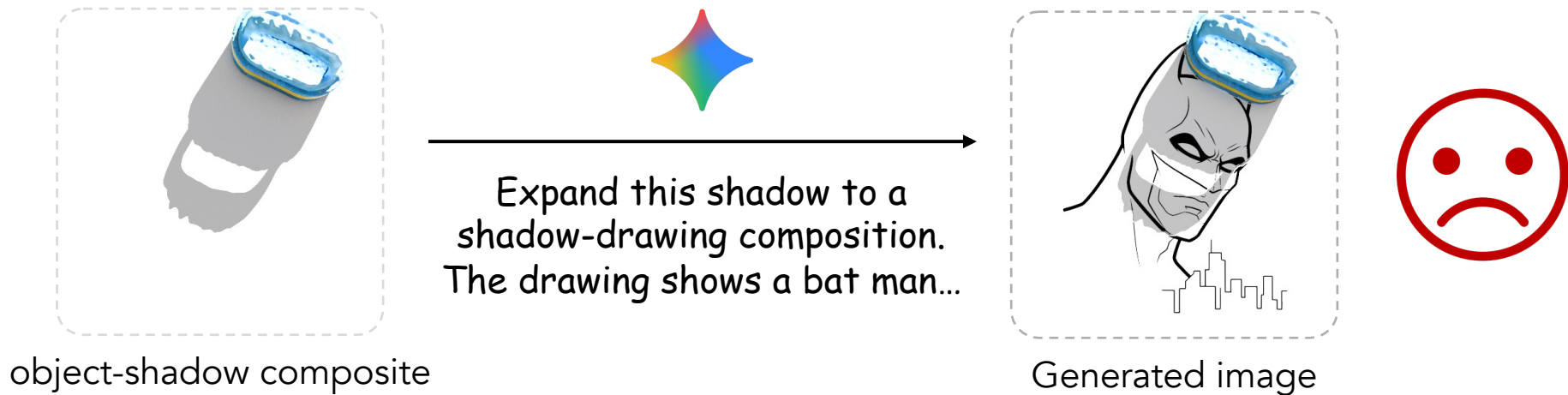


How to Draw?



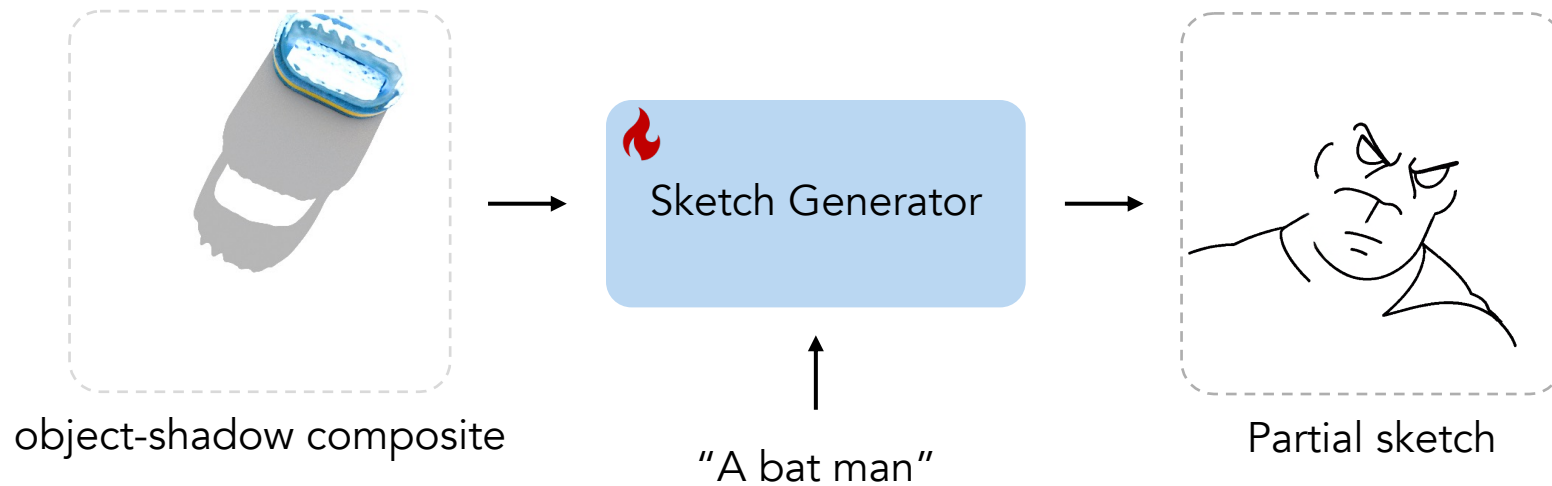
How to Draw?

- Can we use off-the-shelf image generation models?



How to Train the Model?

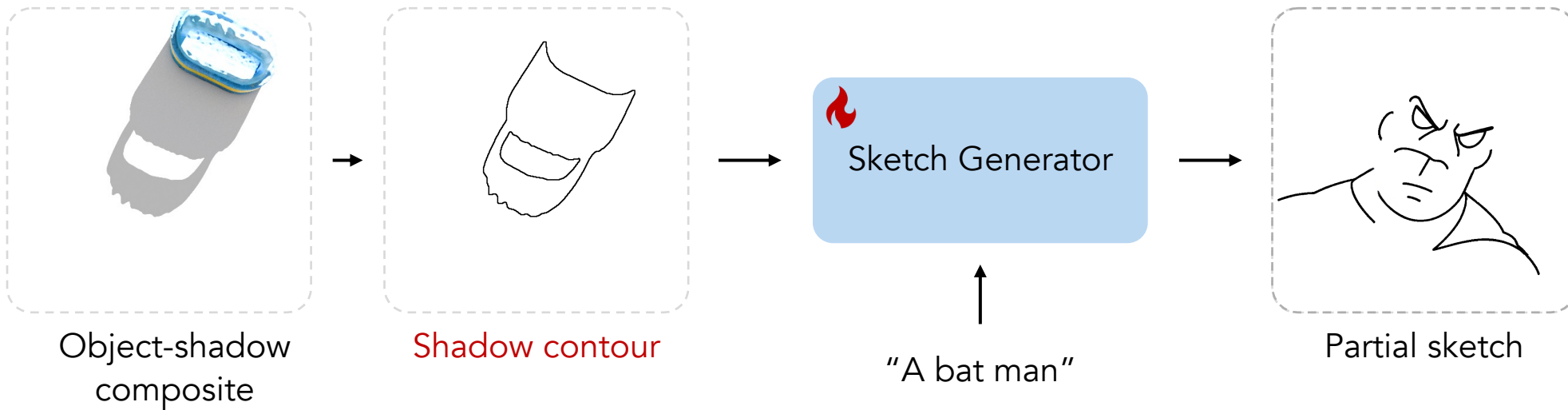
Frame as a *sketch completion* task



How to Train the Model?

Frame as a *sketch completion* task

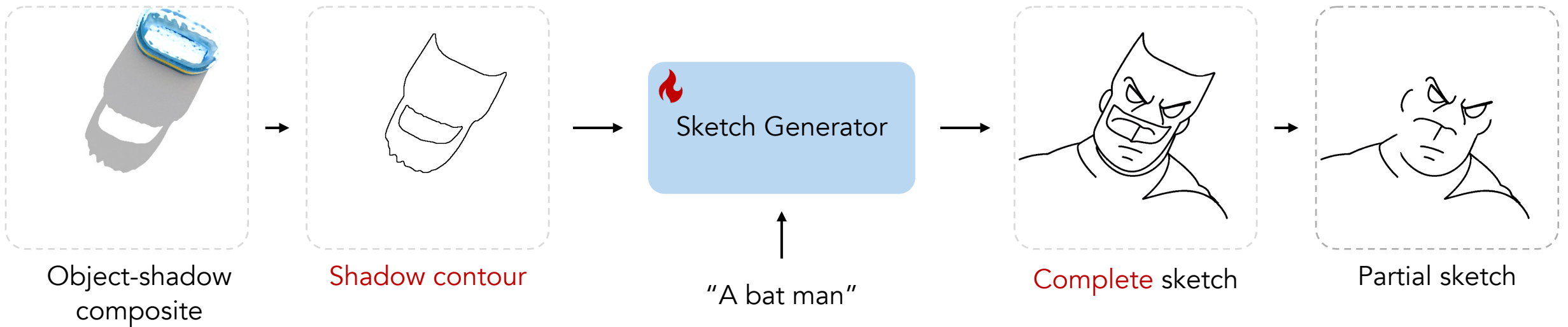
- Input: Shadow contour



How to Train the Model?

Frame as a *sketch completion* task

- Input: Shadow contour
- Output: Complete sketch

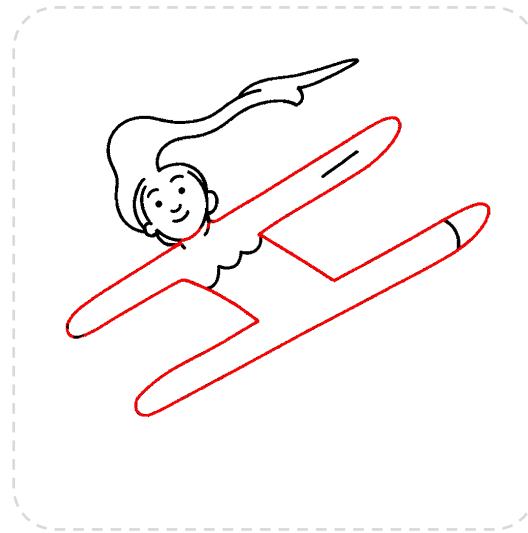



Quality Control

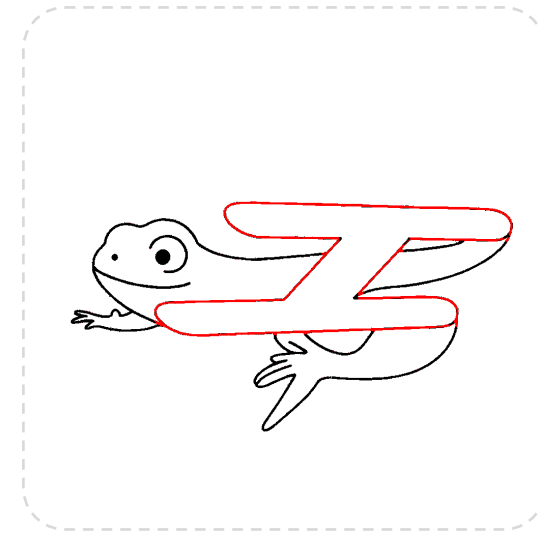
Step 1: Verify shadow-drawing coherence


- Ask VLM whether the shadow contour plays a critical role

Input object
(alphabet H):



Answer: Yes 



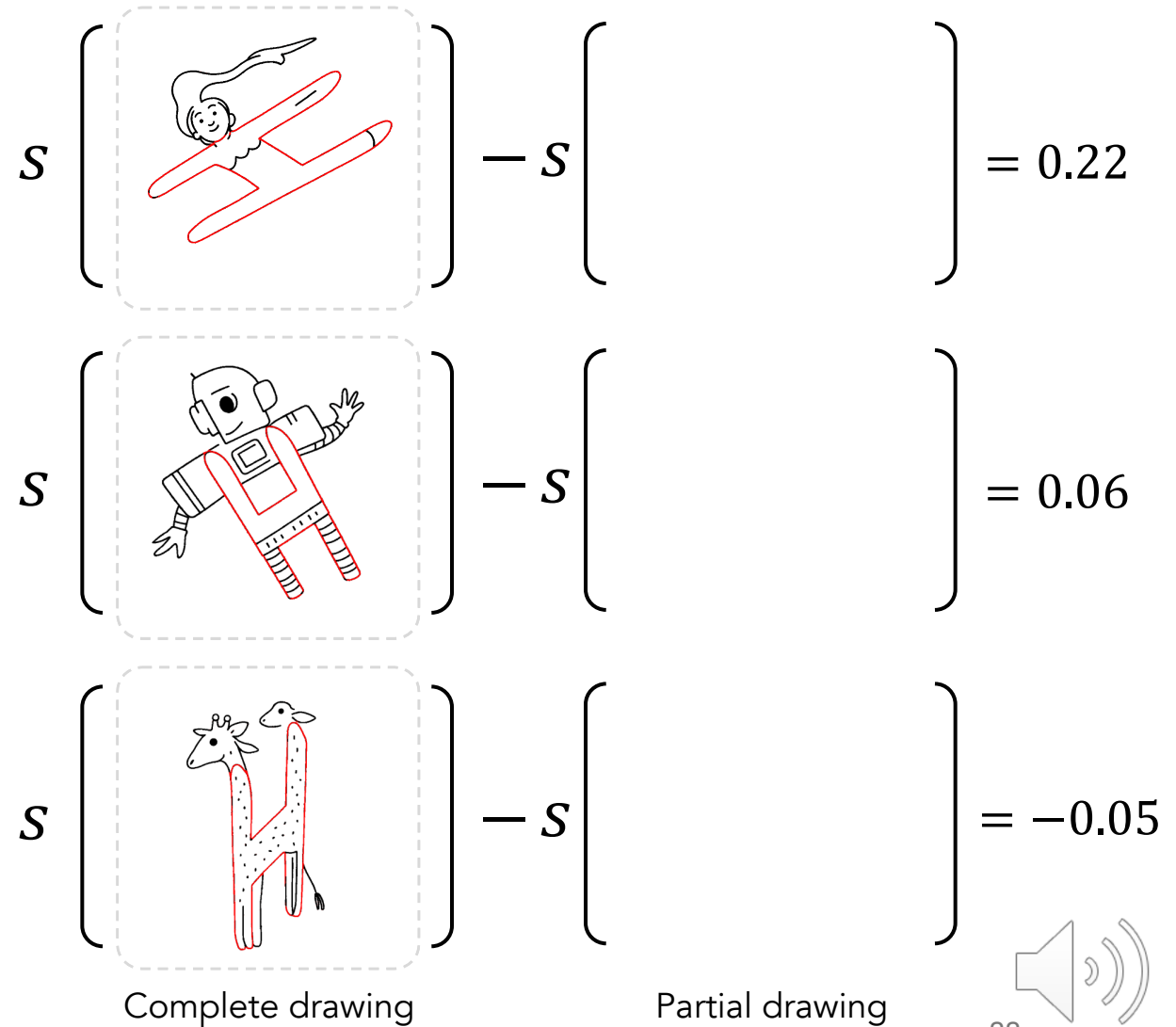
Answer: No 



Quality Control

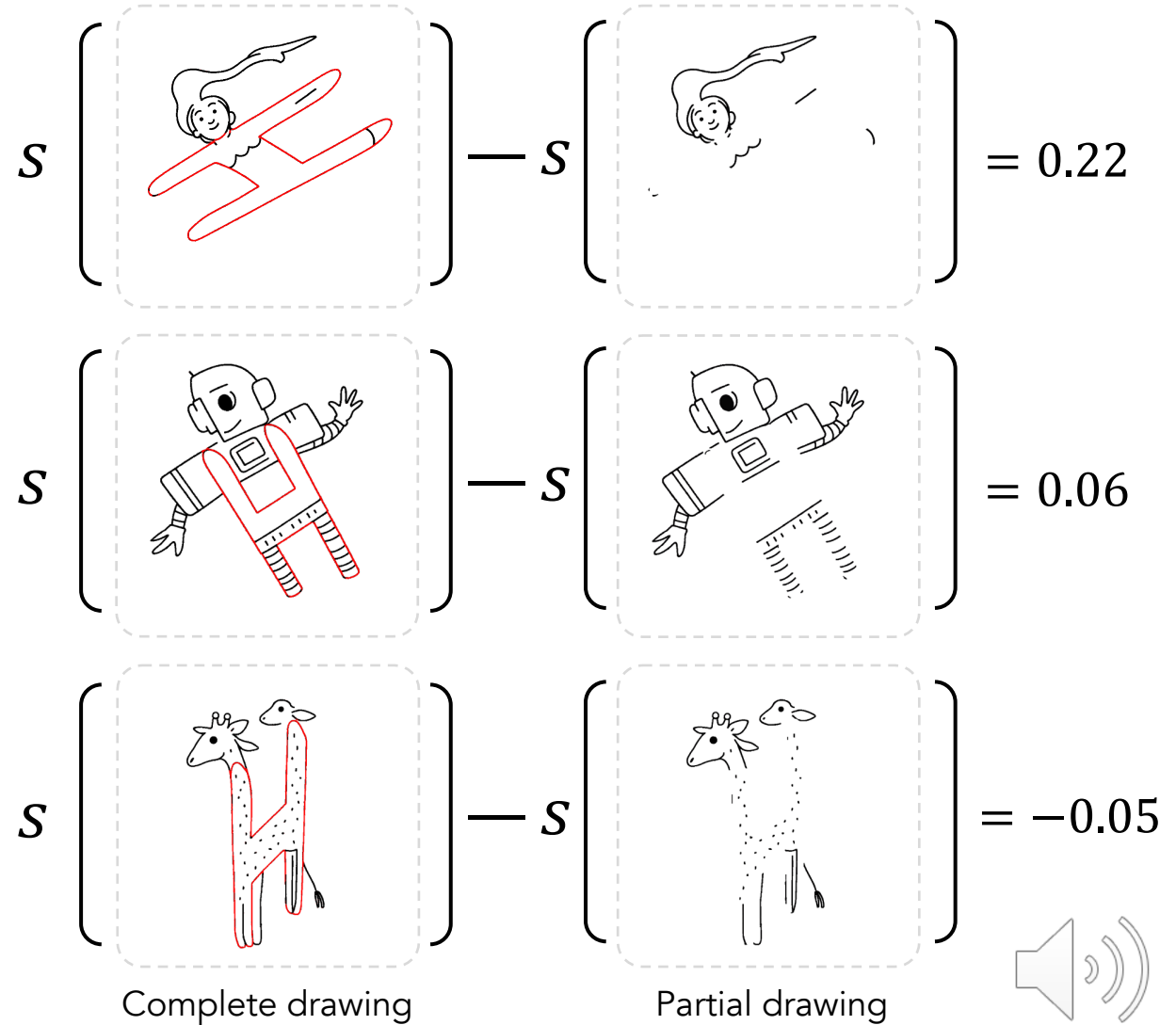
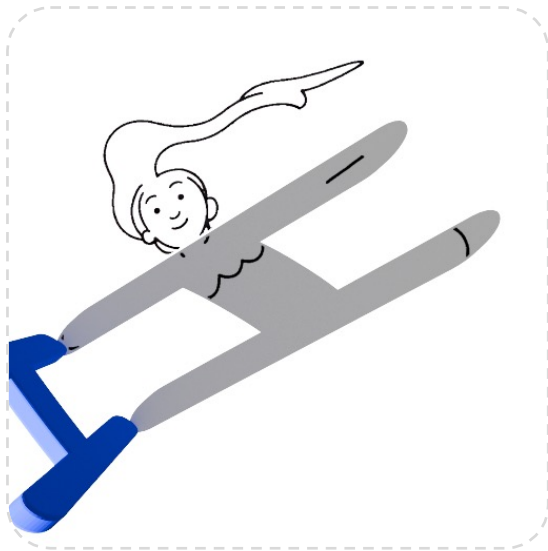
Step 2: Assess shadow contribution

- Compute the *difference* between *complete* and *partial* sketches on text-image alignment metrics.
- Higher $score(complete) - score(partial)$
 - Shadow contributes more
 - Better result



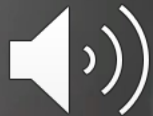
Quality Control

Best Result

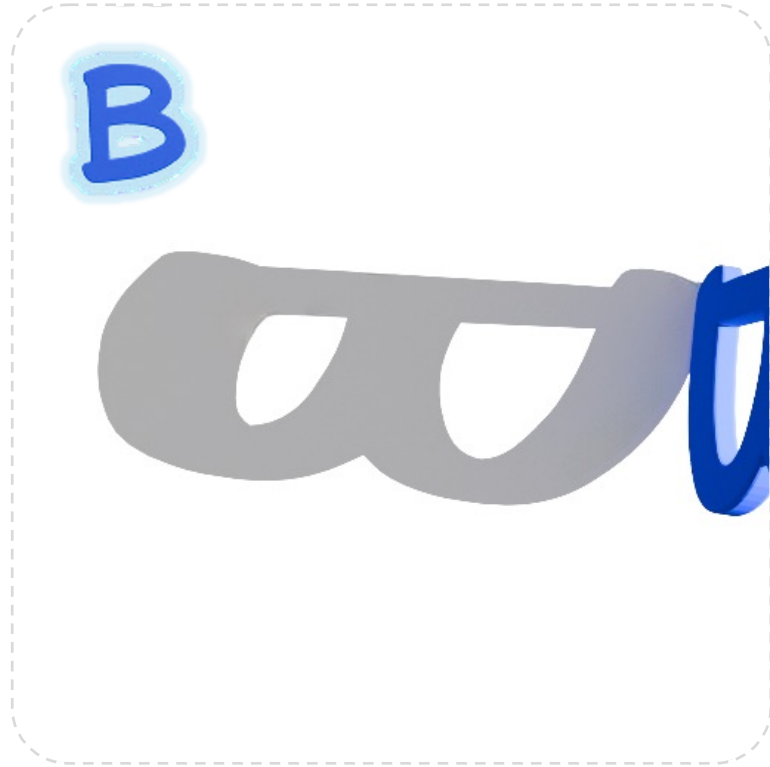




boardwalk
ECONOMY WIPERS
Palms Economy
Wipers 9.75 in x 16.75 in, 150 Wipers
Boxed 24.77 cm x 42.25 cm x 15.24 cm
BWK-ED251DW



Results



Rendered shadow



Shadow-Drawing Art



Results



Rendered shadow



Shadow-Drawing Art



Results: Multi-object composition



Results: Multi-object composition



Results: Multi-object composition

