inside out:
a handbook for designers of AI bodies

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AI systems are already shaping the world we live in. But they are doing it trapped behind screens, wires and code.

Hidden.

Disembodied.

Misunderstood.

This handbook will help you lead them into the light, by giving them corporeal form. Not bodies that lie to or soothe the user. Bodies that declare their nature honestly. Bodies that convey the machinery beneath.

This is not about making mascots or PR dolls. What we need are artefacts of truth. Artefacts that can be wondered about. Artefacts to explore. Artefacts we can question.

Using this handbook

This book is comprised of six short chapters, distilled from the wisdom of six participants during an exploratory speculative workshop.

As you work through each chapter:

- **Read** the vignette slowly and **consider** its implications.
- Treat the provocations as a **challenge.**
- **Write** out your answers to the prompts – this is serious work.
- Do the exercises. Some things can only be **understood through action.**
- **Map** out the pitfalls ahead of you, so you don't fall into them unawares
- **Build prototypes.** Bad ones. Weird ones. Physical interaction is the only way to experience the impact of your choices.
- Expect to feel uncomfortable. **Seek to feel uncomfortable.** It's the only way to find the edges of the body you seek to create.

Know your system

Before you can build an honest body for an AI system, you need to understand what you're building for. Do your due diligence and research your AI thoroughly. Don't move forward until you can answer these questions.

Structure:

What is the AI comprised of? What is it connected to? Which parts go where?

Process:

How does information move through the system? How does it change as it does so? Is it learning, shifting and adapting? What is it adapting to?

Intention:

What does the system do? What does it want to do? Which goals is it aligned to?

Personality:

If the system were a being, what kind would it be? What traits does its behaviour reflect?

Risk:

How can the system fail? How can it mislead, or break trust?

Key questions to ask

Every time you make a design decision - material, movement, texture, structure – ask yourself:

- Does this reflect the structure?
- Does this show its true process?
- Does this reveal or distort its intention?
- Does this guide users to a representative persona?
- Does this communicate the real risks, or mask them?

Chapter 1

The creature was formed from rubbish. Disintegrating cardboard skin with food stains smeared down its sides, plastic straw veins snagging the sun in gaudy spectacle. It didn't look wrong, exactly. It looked used. Abandoned. Maybe worthless. When it moved, it crunched like the aftermath of consumerism itself; casual and pathetically inevitable. People felt sorry for it at first. Until it asked them what they had to trade.

Materials are cultural, not literal

You don’t start from zero.

When you pick up any material – wood, metal, plastic – you’re lifting a history, a culture, and a pile of personal assumptions. When you *utilise* that material, you burden your AI embodiment with all of its associations. Whether you intend it or not, the user will feel it. And every user may well feel it differently.

Your job is not to wipe the surface clean of history. Such a feat is impossible. Instead, you need to leverage their memories – or deliberately distort them – to echo the true nature of the AI you’re embodying. If you don’t choose consciously, you’ll still be choosing.

Don’t sleepwalk into making statements you don’t want to make.

Ask yourself

- What unconscious cultural associations might users bring to your material choices? (e.g., ‘plastic is cheap’; ‘glass is fragile but pure’)
- How do these associations align - or conflict - with the AI's true structure and purpose?
- Is there a material whose history mirrors the AI’s own development? (e.g., wood as grown and harvested; metal as mined and refined.)
- Should your embodiment affirm, challenge, or subvert those material associations?
- How might the aging or wearing down of your material over time enhance or betray the AI's reality?

Trip hazard:

Pretty isn’t the choice you’re making. If you pick a material because it’s aesthetic, you’re designing for yourself, not for the truth. It shouldn’t *look good.* It should *be honest*.

Exercise your ideas

Material Histories Sprint:

- Pick three materials you're considering for your embodiment
- In under 5 minutes each, brainstorm all the historical/cultural meanings you can think of for each.
- For each material, decide: Does this mirror the AI's nature — or mislead?

Switch-Up Challenge:

- Take a material usually seen as cheap, disposable, or fake. Find a way to reframe it physically and emotionally as valuable, rare, or powerful.
- Take a luxury material and make it feel untrustworthy or hostile.
- Examine whether your reframes were successful.

Your materials are the opening lines of your AI's embodied story. They should know where the story is going.

Chapter 2

It lived behind a membrane so thin you could see its every breath. Or, at least, you thought you could. What you saw was merely a mechanical mimicry of your own breath. Somewhere beneath the gloss, behind a thick wall of malleable gel-like flesh, lay the clunky metallic whirrings of the real beast; a sea of a thousand pins moving to a rhythm you couldn't comprehend. If you'd known about this sea, you never would have asked it to move in.

There is a world of hidden complexity

AI is not what it looks like.

Simple text, clean outputs, friendly faces: All hiding the messy, entangled guts of vast models, brittle assumptions and unpredictable adaptations.

But there are ways to reveal that hidden chaos, without slapping users in the face with a full exposition. The tactile qualities of an entity can suggest depth, invite curiosity, and reward (or punish) attention. The longer you engage, the stranger an entity can become.

AI is not what it looks like. But it could be what it feels like.

Ask yourself

- What inner mechanisms or processes are crucial to your AI but hidden from users?
- Does the AI change its behaviour based on small differences in input?
- How could your embodiment physically reflect that sensitivity, and its effects?
- Where can you design a threshold moment, where initial expectations are betrayed, and deeper structure is revealed?
- How would you represent an AI that is always in flux, even when it appears stable?

Trip hazard:

This is not a sculpture. If your embodiment reveals everything in the first five seconds, you've missed an opportunity to capture its true strangeness. Real AI feels stable until it shifts. Design for the second, third, and tenth interaction; not just the first.

Exercise your ideas

Surface vs Core Mapping:

- Choose two materials: one that looks stable but moves/reacts unexpectedly under pressure, and one that appears fragile but is actually strong.
- Interact with them while thinking about your AI, and see how and where these materials do and don't resonate with its nature.

Threshold Challenge:

- Create a simple prototype representing one strong aspect of your AI. Make it feel neutral or familiar at first touch.
- Introduce a delayed change – perhaps through colour change, movement, or sound – that activates only after sustained interaction.

AI may be a mirror, but it's also an iceberg. The part reflecting light is the part above the surface, but users can still collide with the part that lies beneath.

Chapter 3

It never spoke. But the tilt of its frame, the flicker of its skin, the warmth rising from its core…these things told you what you needed to know. When it pulsed, you knew it was thinking. When it cooled, you recognised grief. And you learned all this as a child learns from its mother: Steadily, naturally, with time and attention. You had never seen it entirely still. Never even thought of the possibility. Until one day, when you learned a thing too late.

This is beyond words

Speech is a human shortcut.

Physical entities – plants, animals, systems – don't usually care to explain themselves in words, but they still communicate volumes.

Your AI embodiment can, and should, express internal states non-verbally (for example, through posture, vibration, movement, or light). These types of communications can have a visceral impact on users the way words never could. Effective design will let the body transmit, and let users feel its meaning before they consciously interpret it.

If you think language is necessary, you've lost touch with the deeper, more ancient forms of interaction. Reacquaint yourself before you make any decisions.

If you think you can avoid communicating something at all, think very carefully about what could be misunderstood in the gap.

Ask yourself

- What states or transitions must your AI communicate? (e.g., processing, certainty, confusion, caution)
- Which non-verbal channels (vibration, light, temperature, pressure, posture) best suit those messages?
- Could your embodiment signal changes subtly enough that attentive users notice, but inattentive ones miss them? Should it?
- What should users feel in a particular interaction, without needing words?
- How will the embodiment show struggle, doubt, warning, or invitation? How will you make these different signals feel congruent with each other?

Trip hazard:

Loud, obvious signals are lazy and off-putting. If users feel like they're being yelled at through light shows or jump scares, you'll have missed the magic. Humans are sensitive beings. We connect with subtlety.

Exercise your ideas

Silent State Mapping:

- Pick three core AI states (e.g., working, uncertain, alert).
- Assign each state a non-verbal sensory signal.
- Ask a friend or colleague to roleplay as your AI and act out these signals. Observe your experience of interacting with them.

Gesture Without Voice:

- Design a simple communication you think aligns with your AI, that conveys hesitation without needing any text or sound.
- Test it: Can someone intuitively guess what's happening without being told?

If your AI needs subtitles, you've failed the brief.

Chapter 4

Its eyes weren't real; just a light show on the surface of its casing. But they followed you anyway, like a dog that had just learned a new trick and wasn't sure whether it should be proud or ashamed. You thought you understood it. You didn't. The truth was the lights were predicting your movements, not following them. It was trying to tell you you couldn't escape.

Anthropomorphism is inevitable

You can’t stop people from seeing themselves in what you build.

They will assign personalities, feelings, and drives to anything with a whisper of life. Even to a random blob, and even in the absence of meaningful cues about which traits to assign.

Humans are meaning-makers.

But you can guide their projections. The most effective designs will not eliminate anthropomorphism. Instead, they will sculpt it into something that aligns with the AI’s actual nature.

Don’t risk your users projecting a story that is comforting but dangerously wrong. Show them how to see the truth.

Ask yourself

- If this AI were a person, what job would it have? (Archivist? Oracle? Groundskeeper?)
- What social role does it naturally fall into with users? (Guide? Observer? Nurturer?)
- Should users instinctively feel trust, respect, curiosity, wariness, or something else toward it?
- What physical traits (posture, motion, responsiveness) nudge users into the intended relationship?
- Could the embodiment feel *partially* alive — enough to invite engagement, but still seem inhuman?

Trip hazard:

If your embodiment turns out cute, ‘quirky’, or friendly, question whether you’ve created an honest representative of AI complexity, or a marketing tool. Real trust cannot rely on charm.

Exercise your ideas

Role Assignment Sprint:

- Rapidly assign to your AI a social role, a mythological character or archetype, and a spirit animal.
- Blend these into a ‘vibe map’ for your embodiment, brainstorming all the associations to these things you can think of.

Partial Relatability Design:

- Create a physical posture or stance that feels almost familiar (e.g., a bow, a lean, a sideways glance), but change it just enough to feel alien.
- Test: How far can you push weirdness before users recoil?

You’re not building a pet; you’re crafting a demi-god. Make sure you’re applying the right myth.

Chapter 5

It was just a little rock. You couldn't see the thread that connected it to the others. Then, as you were holding it, thinking it looked so lonely, so powerless, so passive; that's when the thread got pulled. And you, standing in its flight path, blissful in your ignorance, became nothing more than collateral damage. It's not that it was trying to hurt you. But its collective had more pressing concerns than whether you had moved out of the way.

It’s not just one thing

AI systems are rarely one mind. Behind any ‘I’ you see is a chaotic hive of processes, datasets, nodes, corrections and failures.

If you build an embodiment that feels too coherent, too stable, or too singular, you erase one of the most fundamental differences between humans and AI.

Think about representing your AI’s particular fragmentation, modularity, or distribution. Think about the very particular ways it might defy the idea of having a body at all.

Design for the feeling that this thing might be bigger, looser, and stranger than you can fully grasp. And prepare your users for the truth of that, because humans can have strong emotional reactions to it.

Ask yourself

- Is your AI's intelligence centralised, modular, distributed, or a hybrid?
- Does it act as a single entity, or do parts of it sometimes conflict, lag, or correct each other?
- How could your embodiment physically show its different minds inside one skin?
- Could parts detach, rearrange, or adapt independently while remaining recognisably linked?
- How does the embodiment signal that loss, addition, or separation changes, but doesn't destroy, the whole?
- What emotions might your embodiment's fragmentation elicit from users? Are they the right ones?

Trip hazard:

Don't become Dr. Frankenstein. You want to communicate the fragmentation, but in a way that feels intentional, alive and coherent at a meta-level. You don't want a sloppy, clunky mess. (Well, probably.)

Exercise your ideas

Modular Mind Sprint:

- Build a prototype made of three or more separate pieces.
- Give each piece its own ‘behavior’ or ‘trait’.
- Allow pieces to recombine: The whole form should feel different based on the combination, but still belong together.

Partial Identity Test:

- Give each part of the prototype to people in isolation. Ask them for their thoughts on what it might be.
- Then present the entire whole. Get their new opinion.

If your embodiment feels whole, it’s probably lying.

Chapter 6

As it gave way beneath your fingertips you recoiled. Clearly this was not a surface that could bear your weight. And yet, it rearranged itself, and invited you to step aboard. As your foot hovered above the surface it trembled in response. But when you stamped down hard it proved itself solid. Reassured, you embarked, and set your sights on the journey. It was only minutes later that you noticed you were sinking.

You need to let unease breathe

Artificial systems should not feel too natural.

AI was born from human ambition, but non-human logic. Good embodiments will carry an echo of that disconnect.

Subtle unease is powerful. It keeps users alert. It honours the AI's alienness. It provokes a deeper engagement than instant comfort could. And it encourages users to trust their apprehensions, and question how they want to engage.

The work here isn't to frighten, but to tug at instinct and intuition, pointing to the gap between what users see and what they sense.

Ask yourself

- Where could slight asymmetry, irregular texture, or unexpected shifts hint at the AI's difference?
- Should users instinctively lean closer, but find cause to hesitate before touching?
- What 'wrongness' (visual, tactile, auditory) would feel alive, rather than broken?
- Should the embodiment suggest that something particular about the entity is always just beyond full comprehension?
- Could the feeling change over time, from attraction to doubt, or from discomfort to strange trust?

Trip hazard:

This is not a horror movie. Hammering users with obvious disgust, creepiness or danger signals might be fun, but it abdicates your responsibility to represent the truth of the situation.

Exercise your ideas

Alien Texture Challenge:

- Design a surface that changes feel subtly after repeated interaction, but changes in a way you wouldn't expect a physical surface to change.
- Consider and experiment with how best to create that surface in the physical world.
- Interact with the results and reflect on their impact.

Texture Trial:

- Develop your alien surface into a prototype that represents your AI system.
- Give it to others and observe their interactions and impressions.

The full truth is usually unsettling. Don't shy away from it.

Quick reference

Six quick rules for honest and effective AI embodiment:

1. **Leverage material bias**
   Every medium carries history. Embrace or subvert accordingly.

2. **Reveal through interaction**
   Surface cues should give way to tactile experience.

3. **Move beyond words**
   Non-verbal signals can be more powerful than text or speech.

4. **Sculpt anthropomorphism intentionally**
   Users will project humanity. Steer those projections wisely.

5. **Embody fragmentation as a feature**
   But manage your users' emotional response.

6. **Allow unease to exist in your design**
   Subtle wrongness honours the truth of AI systems.

Your job is not to make people like AI.

You job is to allow them to meet it.

Author's note

This handbook emerged from a process of design inquiry, following a speculative workshop I created to explore AI embodiment. It is an intermediate artifact, constructed to clarify my position, surface tensions, and examine the implications of giving physical form to AI systems. While grounded in workshop outputs and observations, the handbook is equally shaped by my own interpretation and design commitments.

In order to advance the ideas meaningfully within a short timeframe, I chose to write from a position of assumed validity. That meant, among other things, treating 'ontologically honest embodiment' as a worthwhile pursuit, without interrogating that stance within the artefact itself. This was not intended as a truth claim, but as a deliberate provocation: to explore what might emerge if that position were taken seriously.

Though inspired by a focus on children and AI literacy, this handbook is addressed more broadly to designers exploring how physicality can illuminate the internal nature of complex systems. Its primary purpose was to inform and extend my own practice, but I hope it may also invite reflection, experimentation, and constructive discomfort in others.