
Uploading Identity & Consciousness

Addressing Needs and Objections

Surviving uploading: Needs & Objections

Fundamental needs:

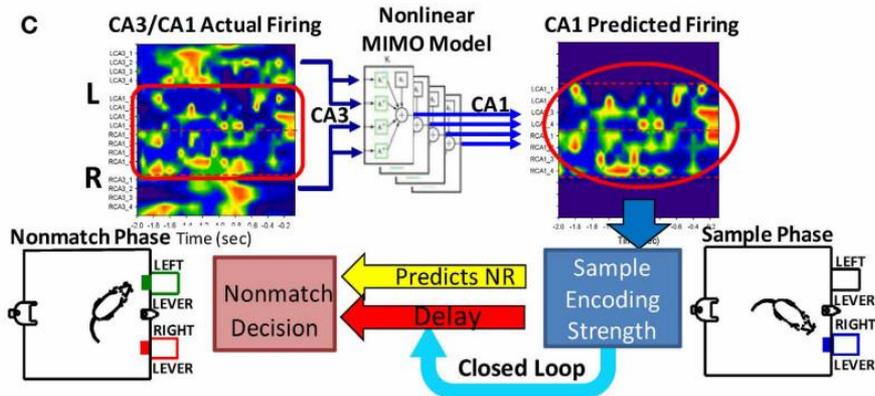
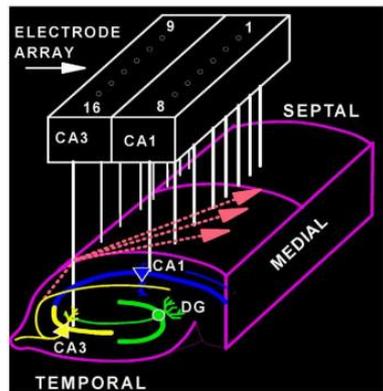
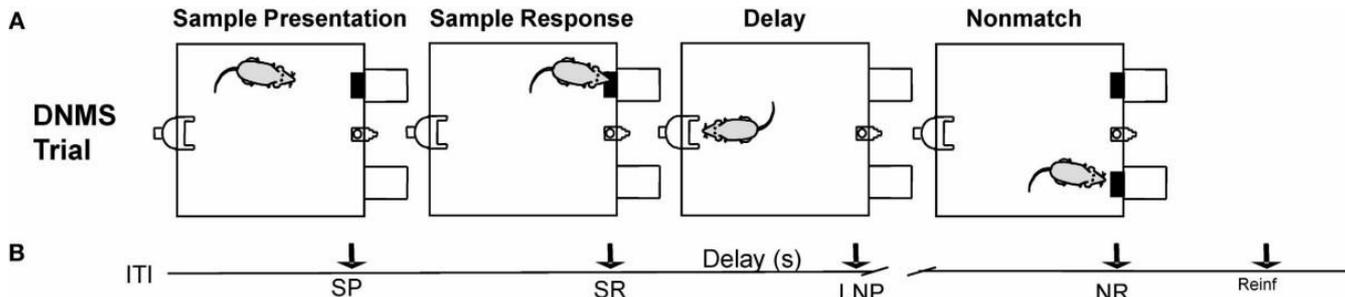
1. A working brain that responds as expected, i.e. that has her memories.
 - a. You can't capture the essential characteristics! (e.g. Nicolelis' objection)
2. Subjective conscious experience with a unified percept ('identity').

Methodological objections:

1. Changes in space or time between source and target brains.
2. Disconnected construction (the 'viral' theory of personal identity).

A working brain that remembers and
responds as it should

Neuroprosthesis - proof of concept brain emulation

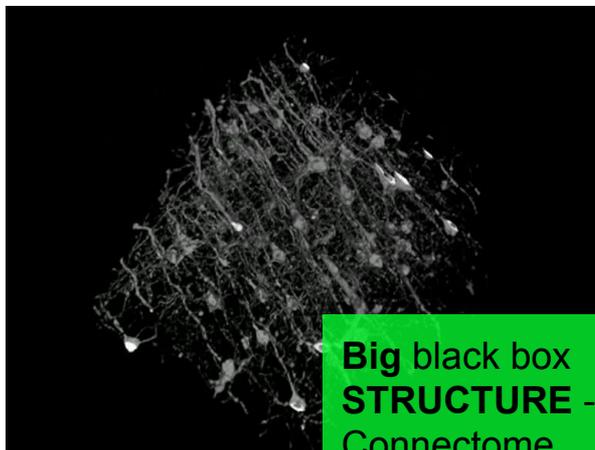


Hippocampal prosthesis

Incremental to whole brain

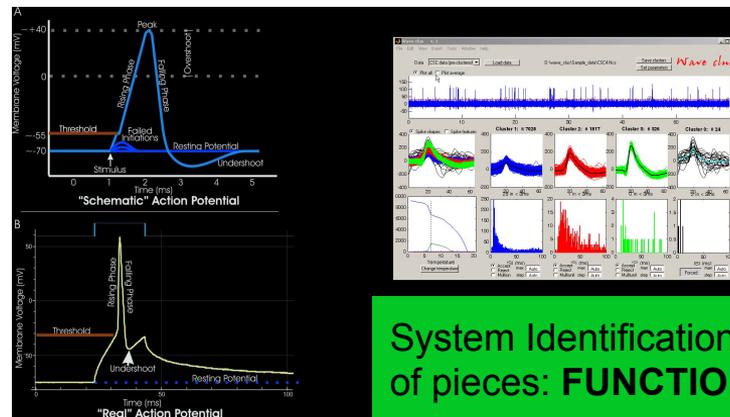
Ultimately: fewer recordings (e.g. structure only) & more inference

Whole brain emulation



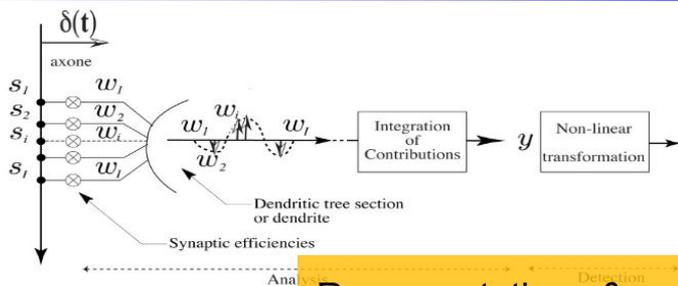
Big black box
STRUCTURE -
Connectome

1



System Identification
of pieces: **FUNCTION**

2



Representations &
Platforms: **EMULATE**

3



Test & Improve:
ITERATE
ROADMAP

4

You can't replicate a brain with a computer!

Nicolelis (& perhaps a few others?): “*The brain [CPU] is not computable and no engineering can reproduce it.*” - due to ‘*unpredictable nonlinear interactions between billions of cells [transistors]*’

1. Strange position for someone in BCI: Already assumes brain codes predictable enough for BCI work = a **functional level**, not purely chaotic
2. The claim that is made for the computer, that it cannot perfectly reproduce results generated by the biology, is **equally true for the biology itself!!!**



Turn back the clock 1 second.
Run the same biological system again.
The result will be different!

But it will be one of many ‘correct’ outcomes. And that is the point of emulation.

The brain works hard to make its own parts predictable enough to work together.

Consciousness

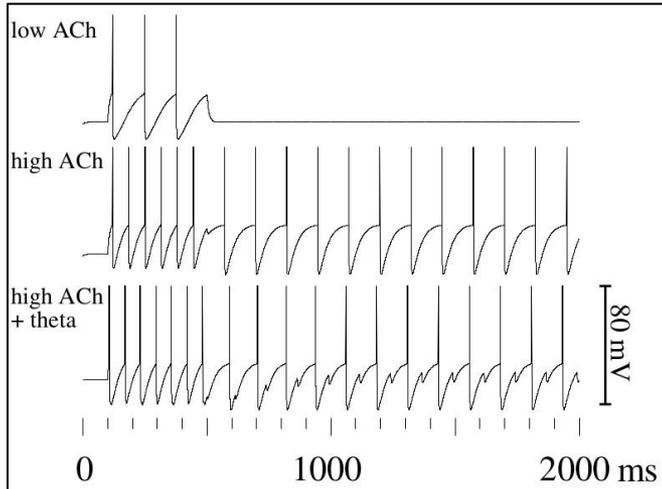
Consciousness is a brain function

- Default assumption has to be: **Consciousness is a cognitive product that emerges from brain function like any other.**
- Claims to the contrary are extraordinary and require extraordinary evidence (or at least... any evidence at all)!
- Therefore: If the functionality of the brain is replicated for those other functions that replication will probably also produce conscious experience.
- Efforts are ongoing to tease out particulars of this function.

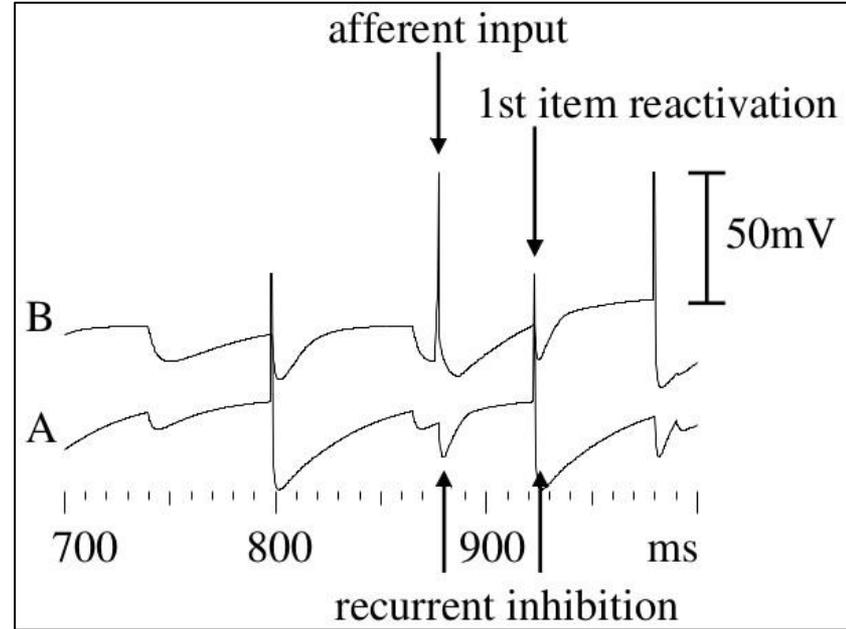
A unified percept (of qualia) depends on Global Binding

A state of being must be discrete. Every part of the unified percept must come together at once and causes our experience & conscious deliberate response.

(This leads some to jump straight to quantum wave functions... despite all the extra problems with that.)

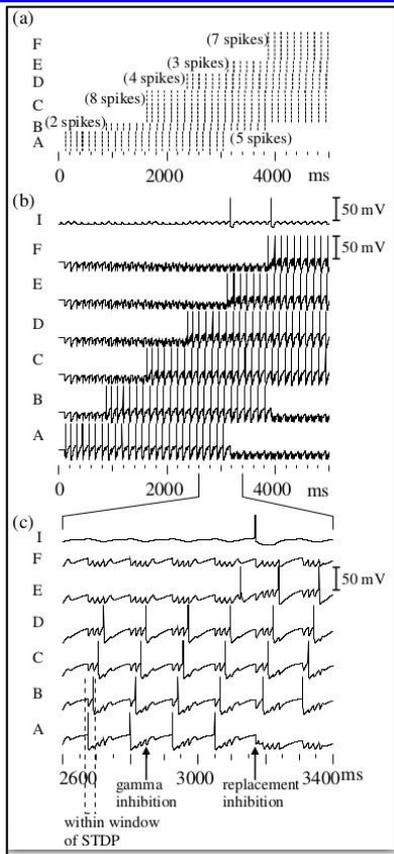


After-depolarization keeps activity going in cortical pyramidal neurons, locked to theta rhythm



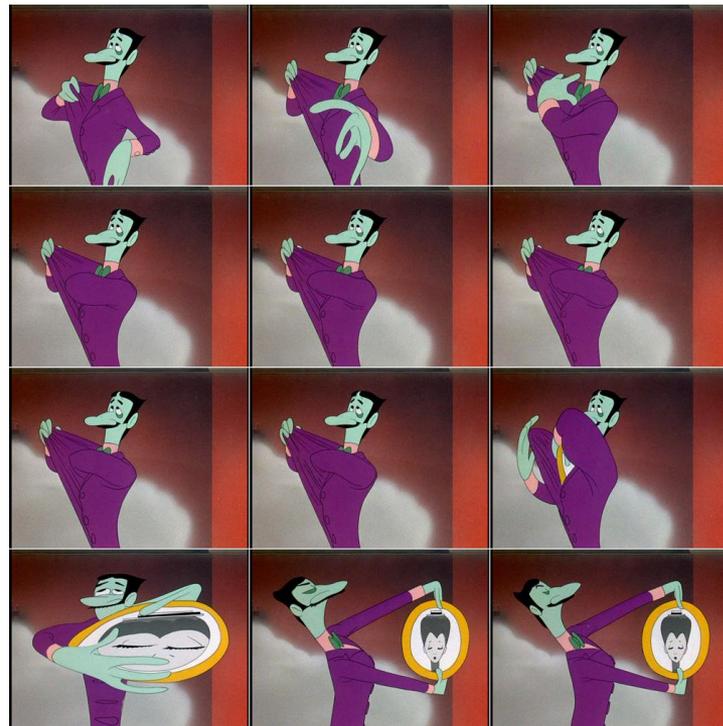
Recurrent inhibition by a network of INTERNEURONS keeps spike patterns together, preventing them from bleeding into each other

You exist because interneurons make you disappear between the frames - discrete global binding



Working memory = rhythmic repetition + discretization by inhibition

Globally bound discrete unified percepts are possible because interneurons make you disappear between the frames.



Identity

Do scan-and-copy / in-place replacement lead to different outcomes?

- Assume:
 - identical physical end-result
 - perfect replication (biological if need be)
- Least controversial: **gradual in-place replacement preserves identity**
- Null-hypothesis 1: Scan-and-copy is like instantaneous in-place replacement (if there were a spatial change argument, what spatial change is the cut-off?)
- Null-hypothesis 2: Instantaneous in-place replacement is like slow/gradual in-place replacement (otherwise, what should be the replacement rate cut-off?)

Does breaking the circuit break the person, i.e. is a person a virus?

- If my brain replica is built next to me, how could I possibly end up there? Doesn't it need to be connected to me first?
- There is a tendency to imagine personal identity as **like a virus that has to infect the new material**.
- But to a materialist: **What** is it that needs to transfer?
- Remember: We assumed that the resulting replica brain is exactly the same with either method!
- Ultimately, this is a quibble about **resolution & depth** rather than about circuit breaking or unbreaking methods.

Identity: Don't turn me off!

Claim: Identity depends on ongoing activity. A discontinuous uploading process would not maintain personal identity, because there would be a discontinuity in brain activity.

- Do we accept this claim in another context?
 - Anaesthesia
 - Deep hypothermic circulatory arrest: a state of hibernation at 12–18 °C with no breathing, heartbeat, or brain activity for up to one hour
 - Suspended animation or Cryonic procedures
- If global binding is essential and achieved only every 12.5 ms for about 2ms at a time, does she cease to exist every time?

Thank you
