

# The Stream of Consciousness and Personal Identity

A slide presentation to accompany the 2019 article of the same name

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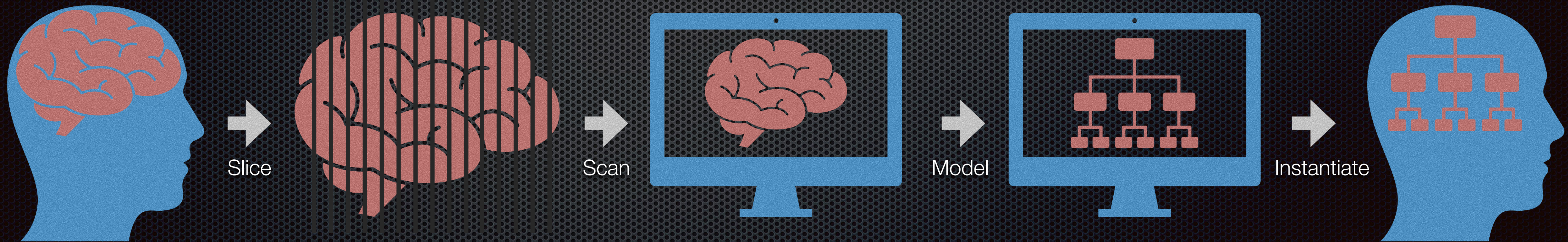
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# Introduction

One potential method of *mind uploading* (MU) is *scan-and-copy* (SaC), in which the brain is completely scanned, with the scan data then instantiated in some futuristic neural-processing computer.



# Introduction

It is sometimes argued that SaC\* MU‡ fails to preserve personal identity on the grounds that it fails to preserve a purported *stream of consciousness* (SoC).

The claim is that the subject dies and vanishes, while a new replacement person emerges in the upload.

This presentation argues against such a claim.

# The stream of consciousness

What does *stream of consciousness* refer to?

A straightforward notion of SoC\* is simply our stream of waking thoughts.

But then do sleeping, fainting, and anesthesia break the SoC?

Initially, the SoC argument against MU would claim that such gaps in the SoC erase identity.

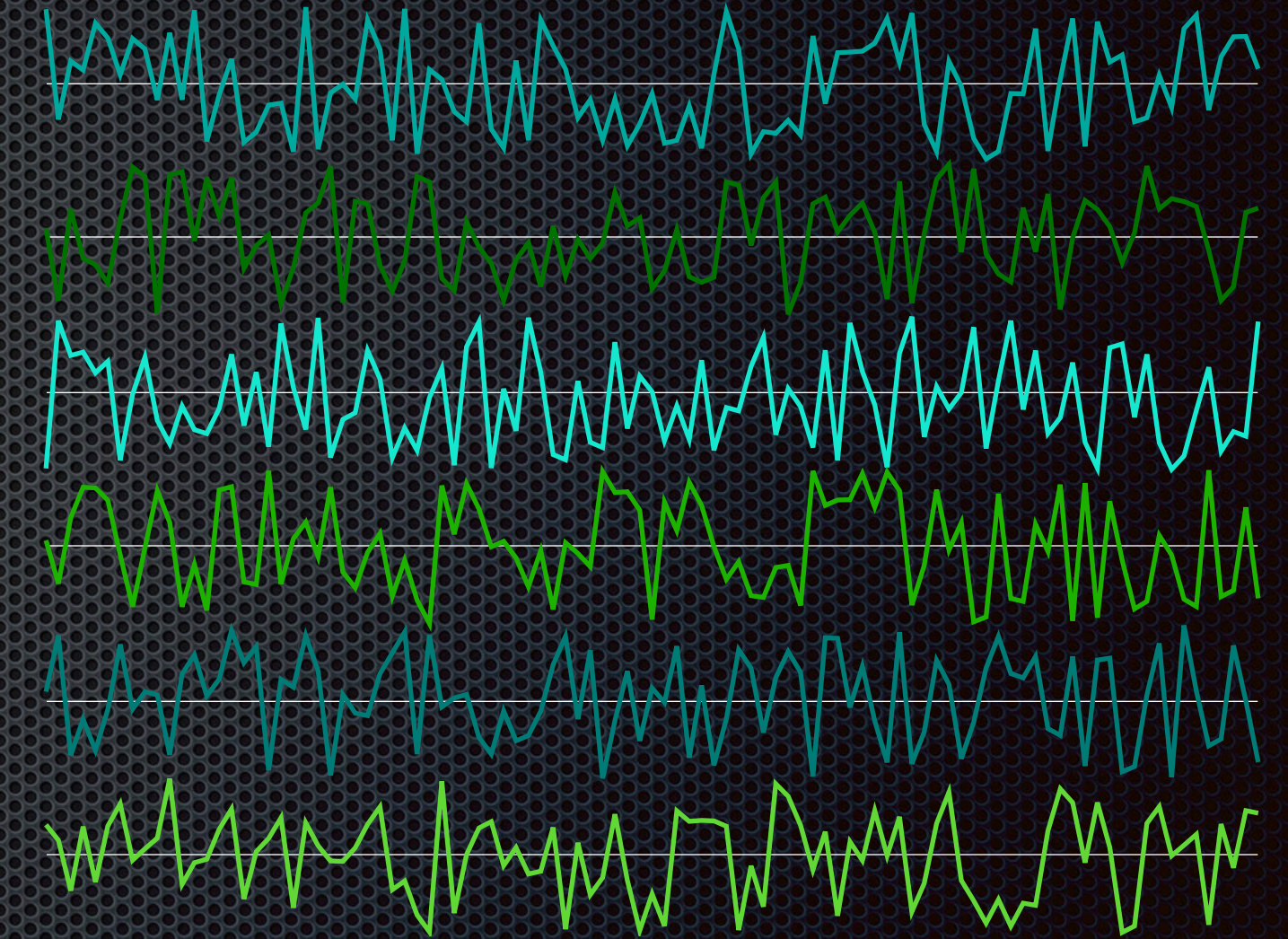
# The stream of consciousness

One solution is to introduce  
a *bridging* criterion that ties  
identity across gaps.

Another solution is to seek a different  
definition of SoC that directly persists  
across such “awareness” gaps.

# The stream of consciousness

Perhaps SoC refers to something that would persist across gaps in waking consciousness, such as basal neural activity and its consequent mental effects, no matter how subconscious.



Revise claim: break this neural activity, no matter how minimal it may be, and identity and survival are lost, even if that neural activity is restarted later.

# The stream of consciousness

*Stream of consciousness proponents* (SCPs) often accept MU so long as it is done continuously, preserving ongoing neural function.

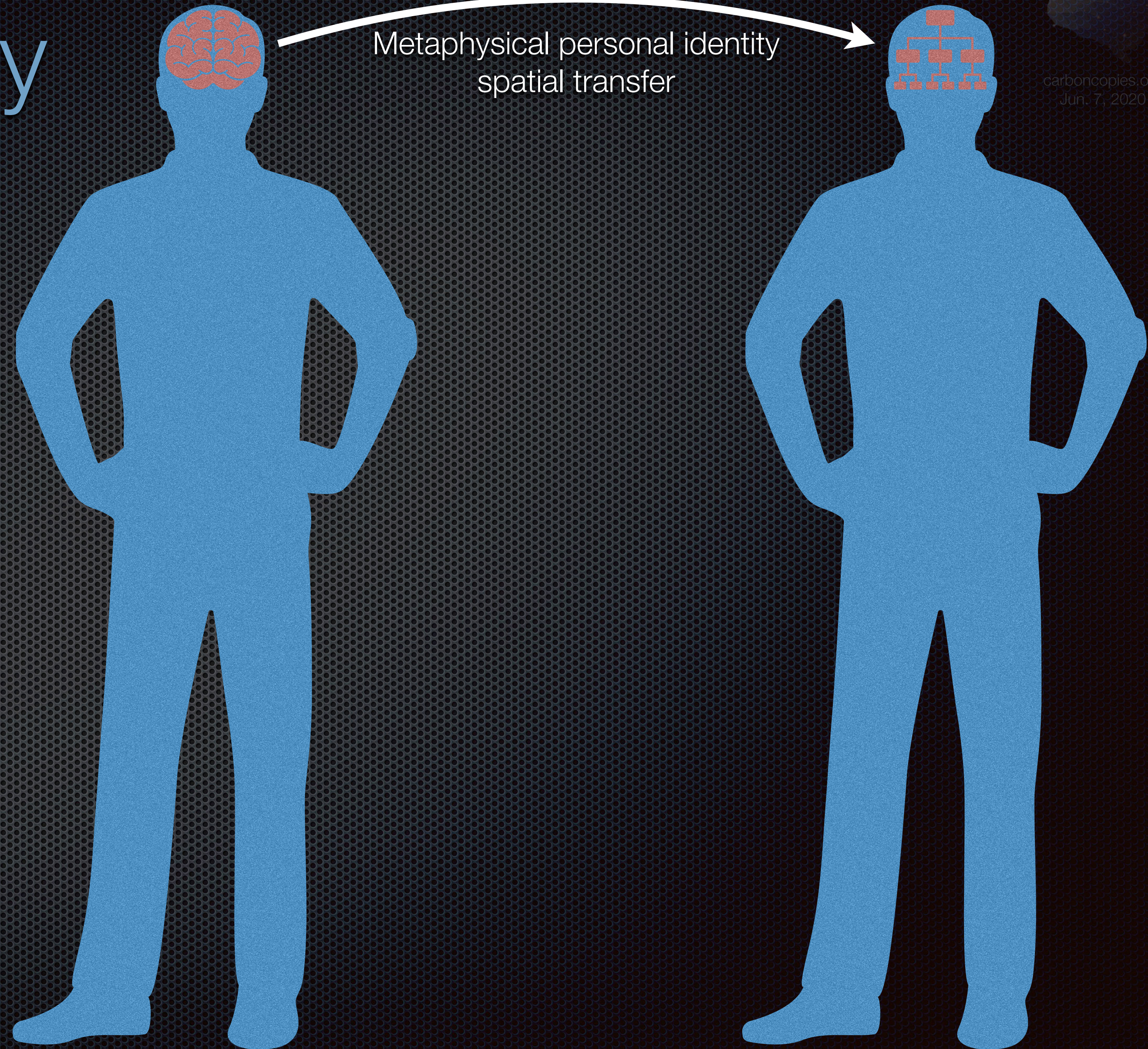
A popular proposal is *gradual in-place replacement* (GIPR): billions of nanobots steadily replacing biological neurons. SCPs often feel this method can preserve identity and survival.



But does this intuition withstand scrutiny?

# Spatial continuity

It is sometimes asked how, in discontinuous SaC\* MU, identity transfers from the brain to the computer that will continue the neural function, mental experience, and metaphysical identity?

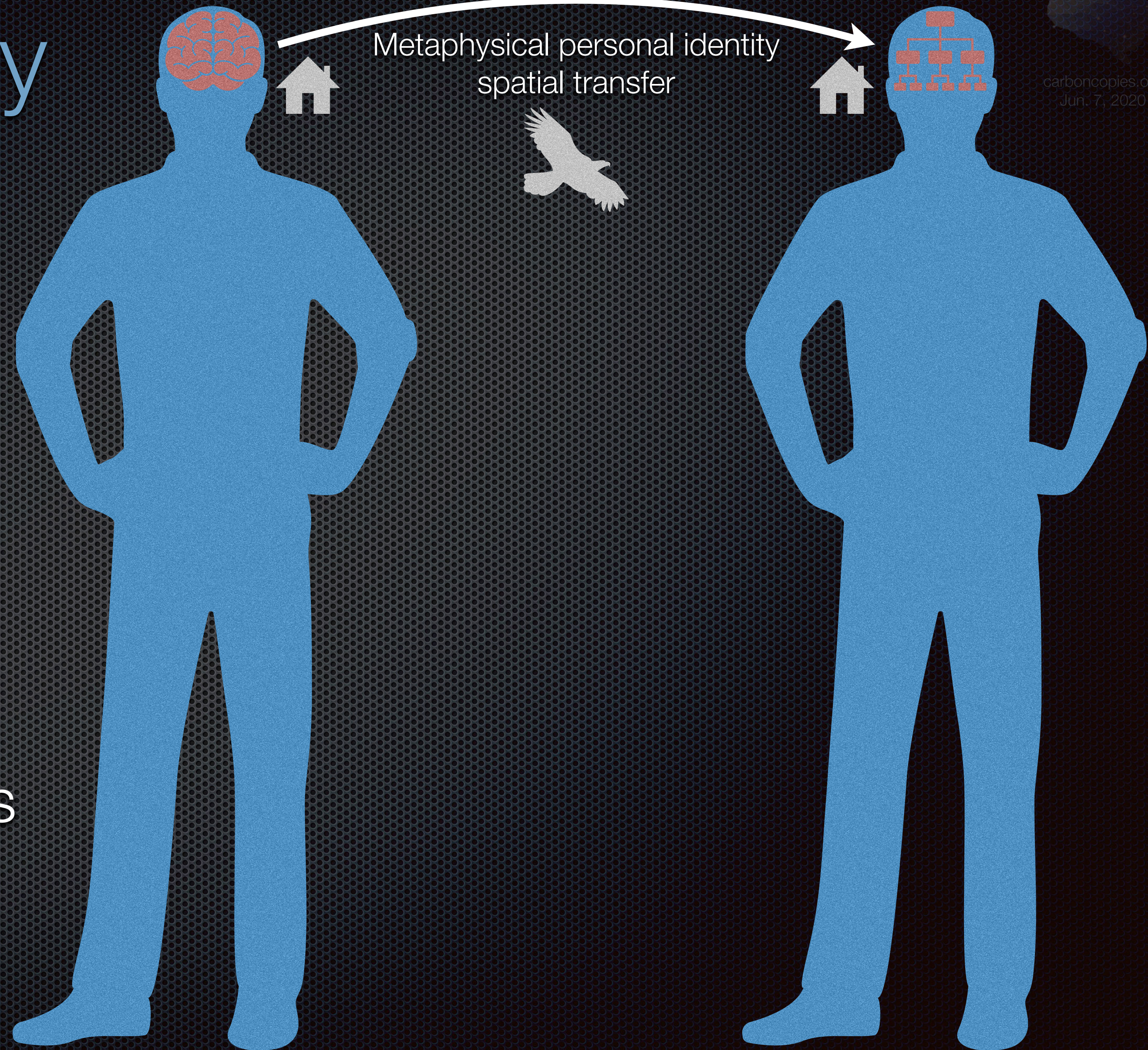




# Spatial continuity

This view treats abstract identity like a physical object that must fly out of your head, over to the computer that will be its new physical home.

It is argued that GIPR\* involves no such spatial transfer and therefore preserves identity.

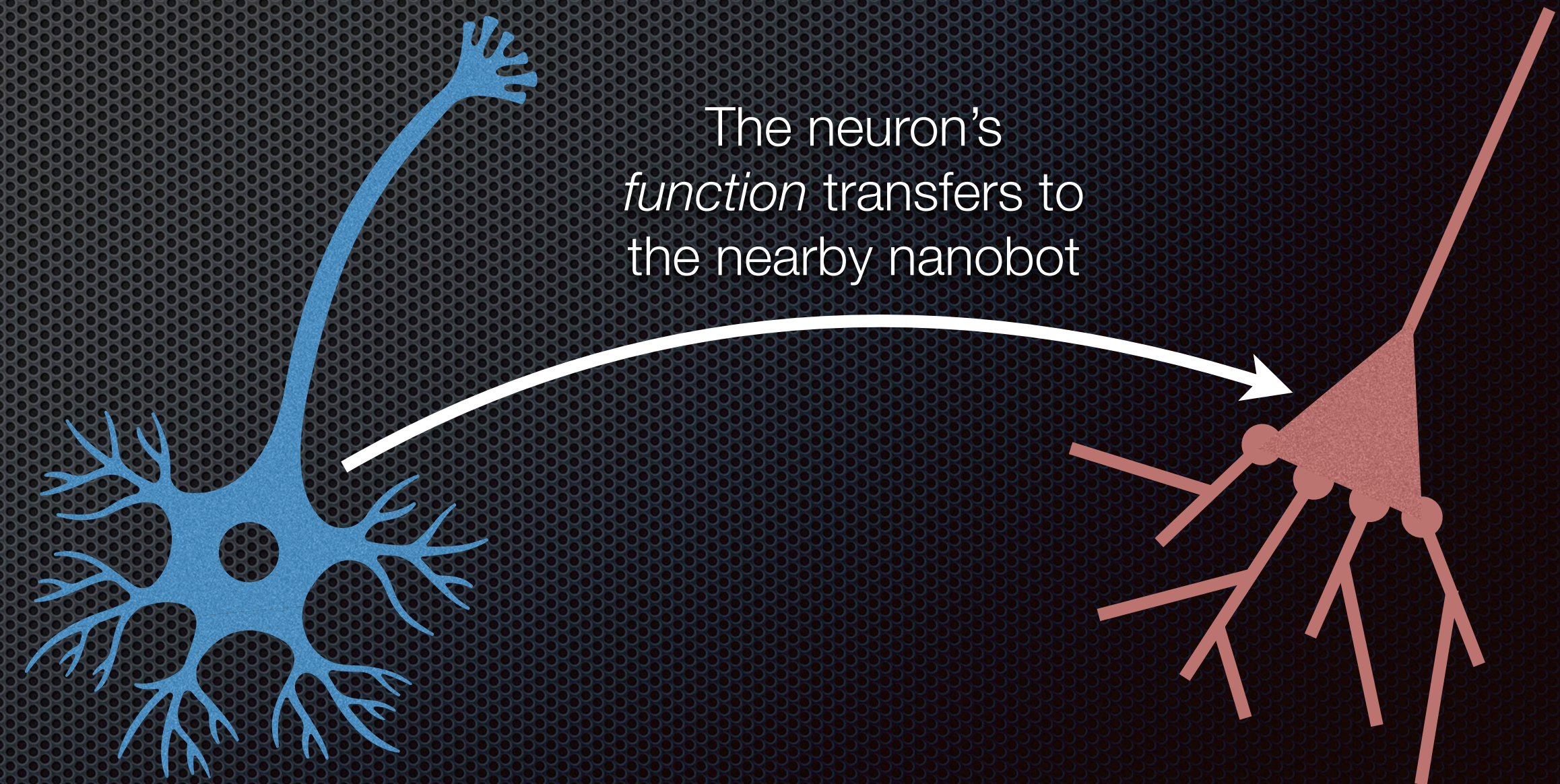


\*Gradual in-place replacement

# Spatial continuity

The assumption that GIPR does not involve discontinuous spatial transfer of abstract aspects of identity is simply incorrect.

When a nanobot resides near a neuron, models its function, and eventually assumes that function, the functional role conceptually transfers through space to the nanobot.

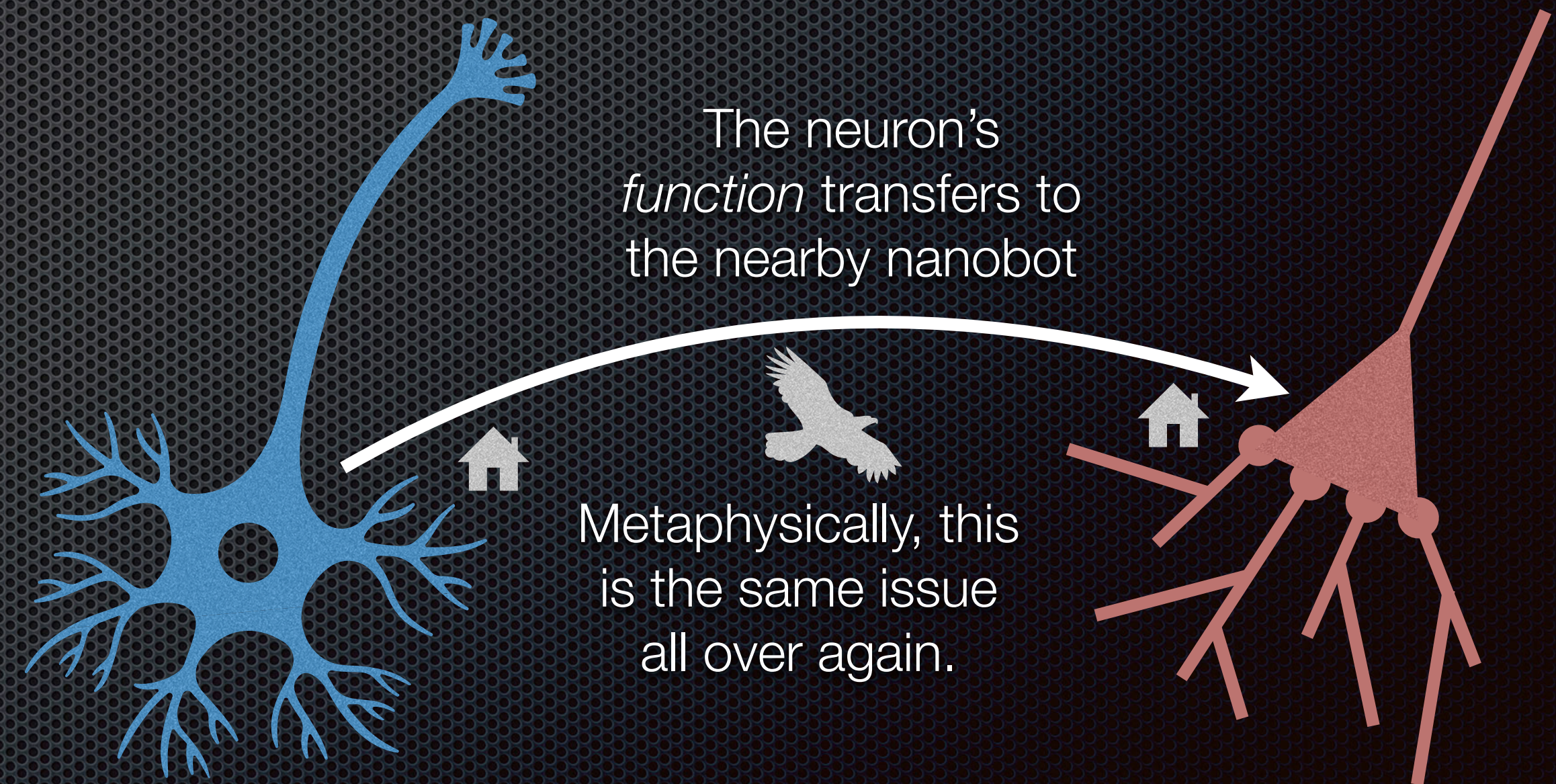


This distance is on the order of tens of microns.

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# Spatial continuity

Astoundingly, across 86 billion neurons, GIPR accumulates **100s of kilometers** of discontinuous spatial transfer of neural function.

This fact is never addressed by GIPR proponents.

So the assumption that GIPR preserves identity **because** it avoids the spatial transfer problem is simply wrong.

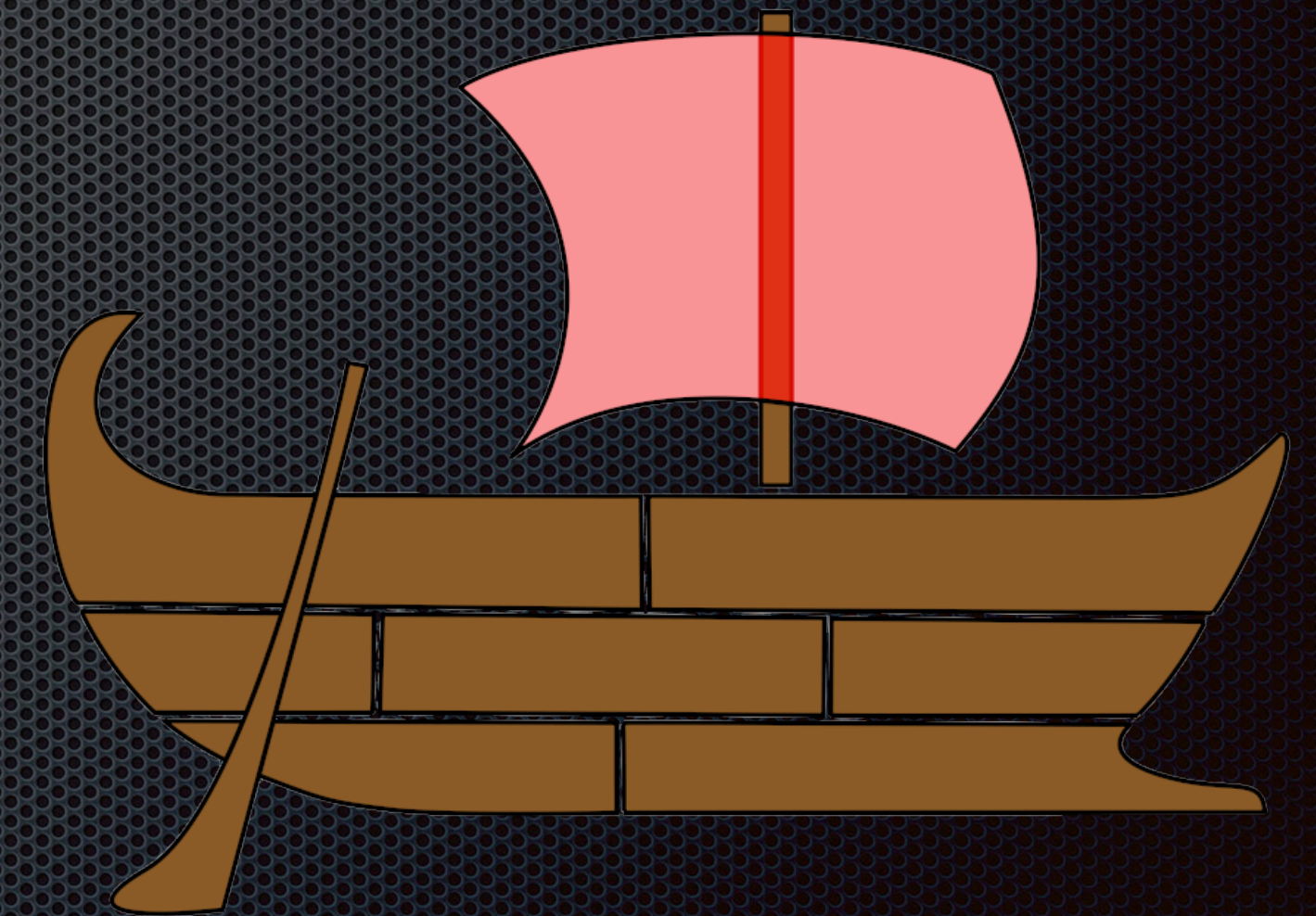
# Spatial continuity

Consequently, to continue to favor GIPR while dismissing SaC\* ***on the grounds of spatial transfer*** is unjustified.

But other reasons to favor GIPR are often given as well.  
Let's take a look.

# Spatial continuity

Another claim is that the critical distinction granting GPR its identity preservation status is that it is performed piece-meal, like the infamous *Ship of Theseus*\*.



# The neural threshold of the stream of consciousness

But **why** would piecemeal replacement matter?

Apparently, because preservation of continuous neural function is critical.

By **why** should continuous neural function be important?

Because it enables a continuous SoC!

So is the SoC important in the first place? Let's see...

# The neural threshold of the stream of consciousness

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How are you confident of your identity relative to past *versions of yourself*, such as from before:

- ✦ Five minutes ago.
- ✦ Falling sleep.
- ✦ Fainting.
- ✦ A concussion, grand mal seizure, stroke, or other neurological trauma.
- ✦ General anesthesia.
- ✦ Medically induced hypothermia to protect your brain during a cardiac emergency.
- ✦ Rapid frigid drowning in which you fall in a freezing cold lake, drown, remain submerged for an hour, are taken to the hospital, confirmed to have no pulse or brain activity, and then revived.
- ✦ Some as-yet-speculative stasis, such as hibernation or cryonics.

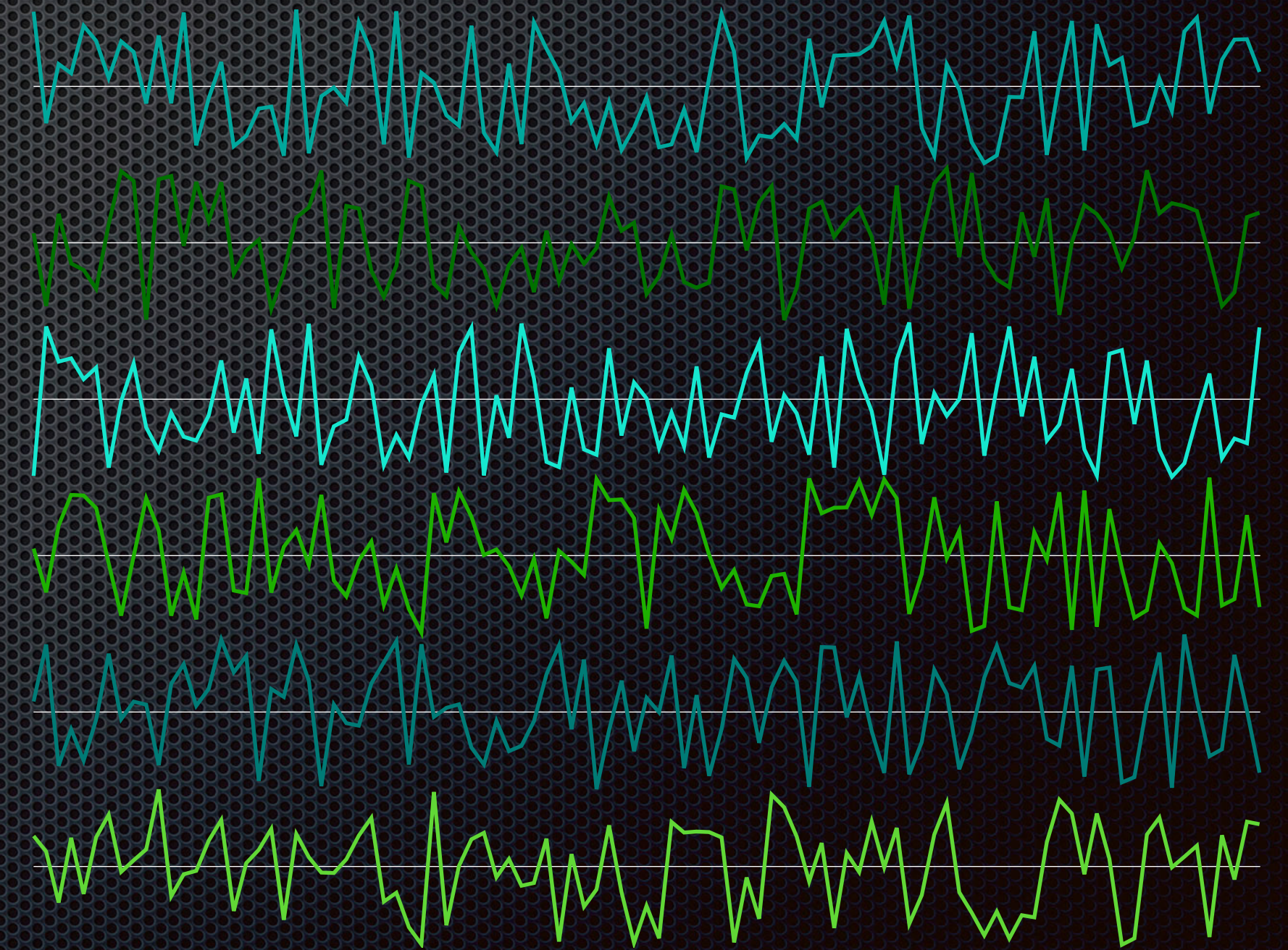
This is the *bridge problem* in philosophy of identity: how does identity preserve across varyingly severe losses of SoC?



# The neural threshold of the stream of consciousness

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The most common response by SCPs\* to the scenarios on the previous slide is to argue that some tenuous basal neural activity persists in all such cases, and that therefore the SoC argument is unaffected.



\*Stream of consciousness proponents

# The neural threshold of the stream of consciousness

SCPs argue that in none of the scenarios above does the last tendril of neural activity cease.

Therefore, some mental activity continues, even if entirely subconscious, aka the SoC.

From this maintained thread of unbroken psychological states, it is argued there is a preservation of identity and survival of the person.

# The neural threshold of the stream of consciousness

But is that true?

# The neural threshold of the stream of consciousness

Is there some persistence of neural function and conceivable mental continuation of thought?

- ✦ Five minutes ago. **YES**
- ✦ Falling sleep. **YES**
- ✦ Fainting. **YES**
- ✦ A concussion, grand mal seizure, stroke, or other neurological trauma. **YES**
- ✦ General anesthesia. **YES**
- ✦ Medically induced hypothermia to protect your brain during a cardiac emergency.
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So far, the SCP claim is, if not validated, not necessarily defeated.

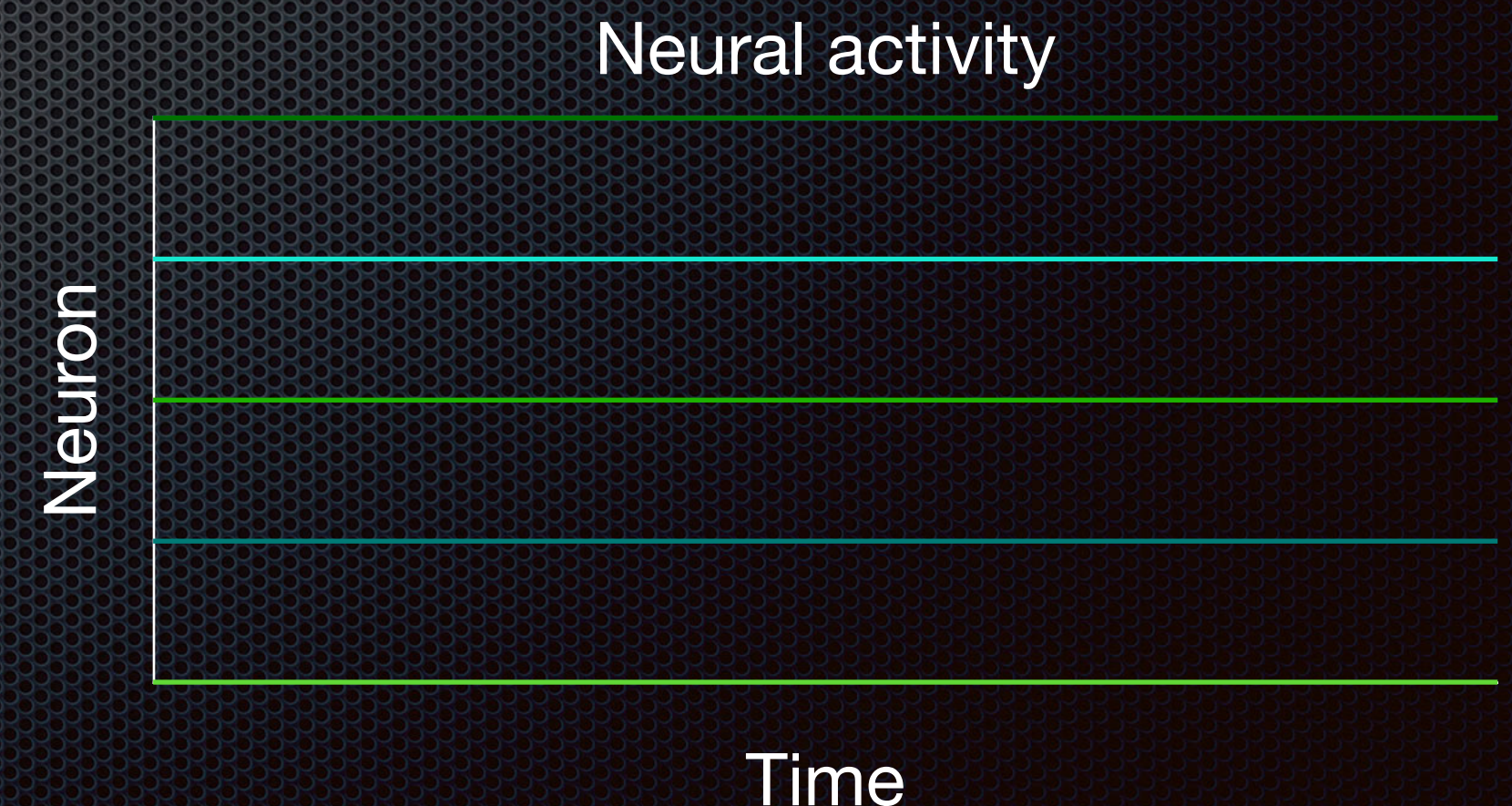
# The neural threshold of the stream of consciousness

## Medically induced hypothermia and rapid frigid drowning

- On one hand, rapid freezing drowning isn't "freezing solid":
  - Victims don't drop below 0°C.
  - The current record is a descent to 13°C.
  - So one might argue that neural function persists.



- On the other hand:
  - There is no *neurological activity*: no action potentials, so no signal propagation or signal processing, which is the long-standing model of how the brain works.
  - Experiments on medically induced hypothermia patients confirm that neural activity ceases much warmer, at 21°C.



# The neural threshold of the stream of consciousness

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Observe that SCPs really ought to reject cryonics on the basis of their requirement for a preservation of neural activity and consequent SoC.

# The neural threshold of the stream of consciousness

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Since we don't judge **real-world** medically induced hypothermia and rapid frigid drowning patients to be doppelgängers, we have clearly already discarded the basal-neural-activity/SoC argument against MU identity preservation.

Therefore, the SCP claim is inconsistent with real-world medical cases!



# Experimental confirmation of the stream of consciousness

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One rather pleading response could be that we don't understand the brain well enough and that neural activity does, in fact, continue at the temperatures of contemporary hypothermic medical cases.

This is a desperate appeal, at odds with all of known neuroscience, and without justification other than a predetermined conclusion in search of an excuse.

But let's briefly explore it.

# Experimental confirmation of the stream of consciousness

What if the true temperature at which neural function diminishes enough to destroy identity is colder than any medical case yet seen, say 12°C?

# Experimental confirmation of the stream of consciousness

We are left with a strange scenario:

Consider a patient who descends below the determined threshold, say  $12^{\circ}\text{C}$ , and is revived healthy with her memories and conviction of her own identity intact.

Would we realistically brand her a copy and treat her dismissively?

How is such a scenario any different from the current world record of a  $13^{\circ}\text{C}$  real-world rapid frigid drowning case?

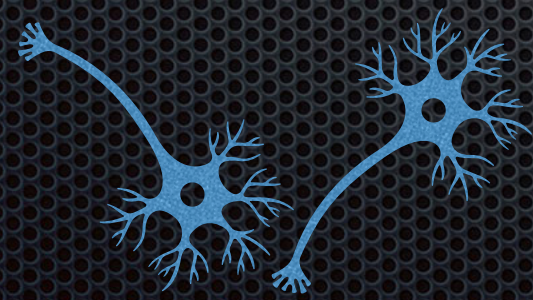
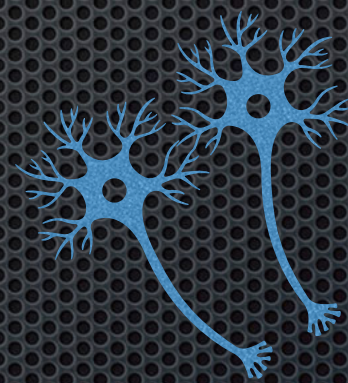
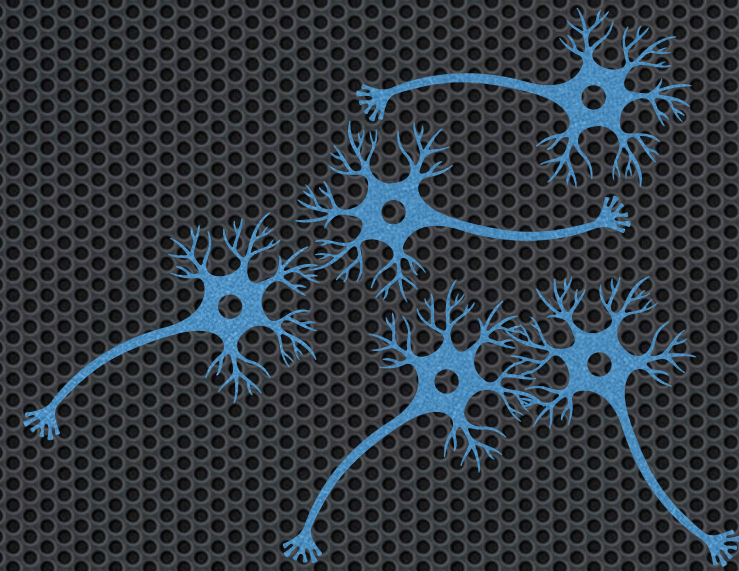
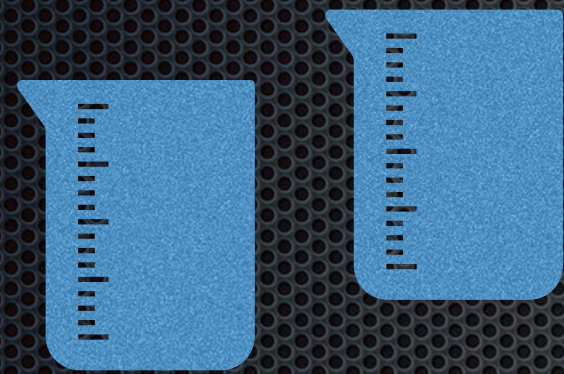
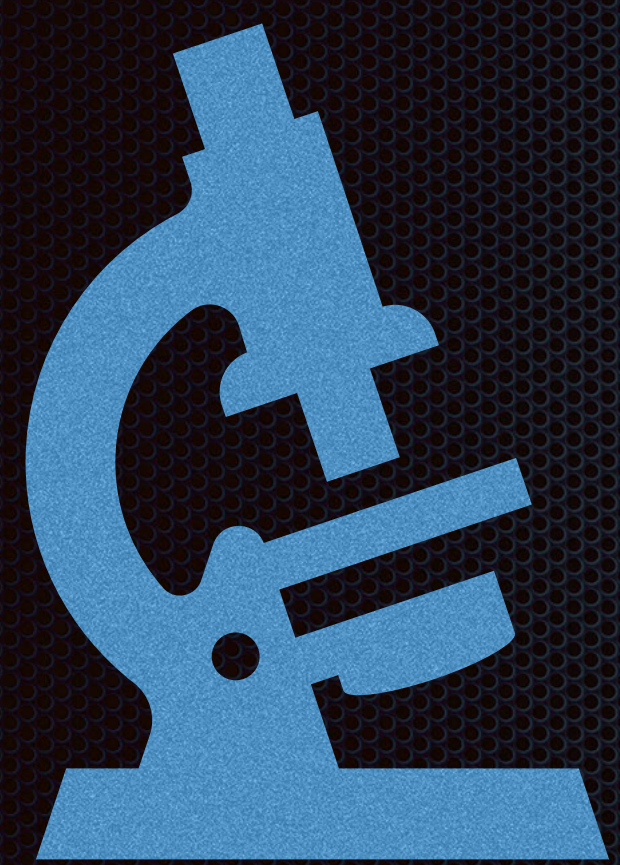
# Experimental confirmation of the stream of consciousness

If a revived 12°C patient ***was an SCP***,  
would she disregard her own sense of  
identity, believing herself to be a copy?

If you, the reader, are an SCP,  
would you regard yourself this way?

# Experimental confirmation of the stream of consciousness

No experiment could ever determine this threshold, this temperature below which neural activity decreases to an extent that abstract personal identity phase-transits from preservation to vanishment.



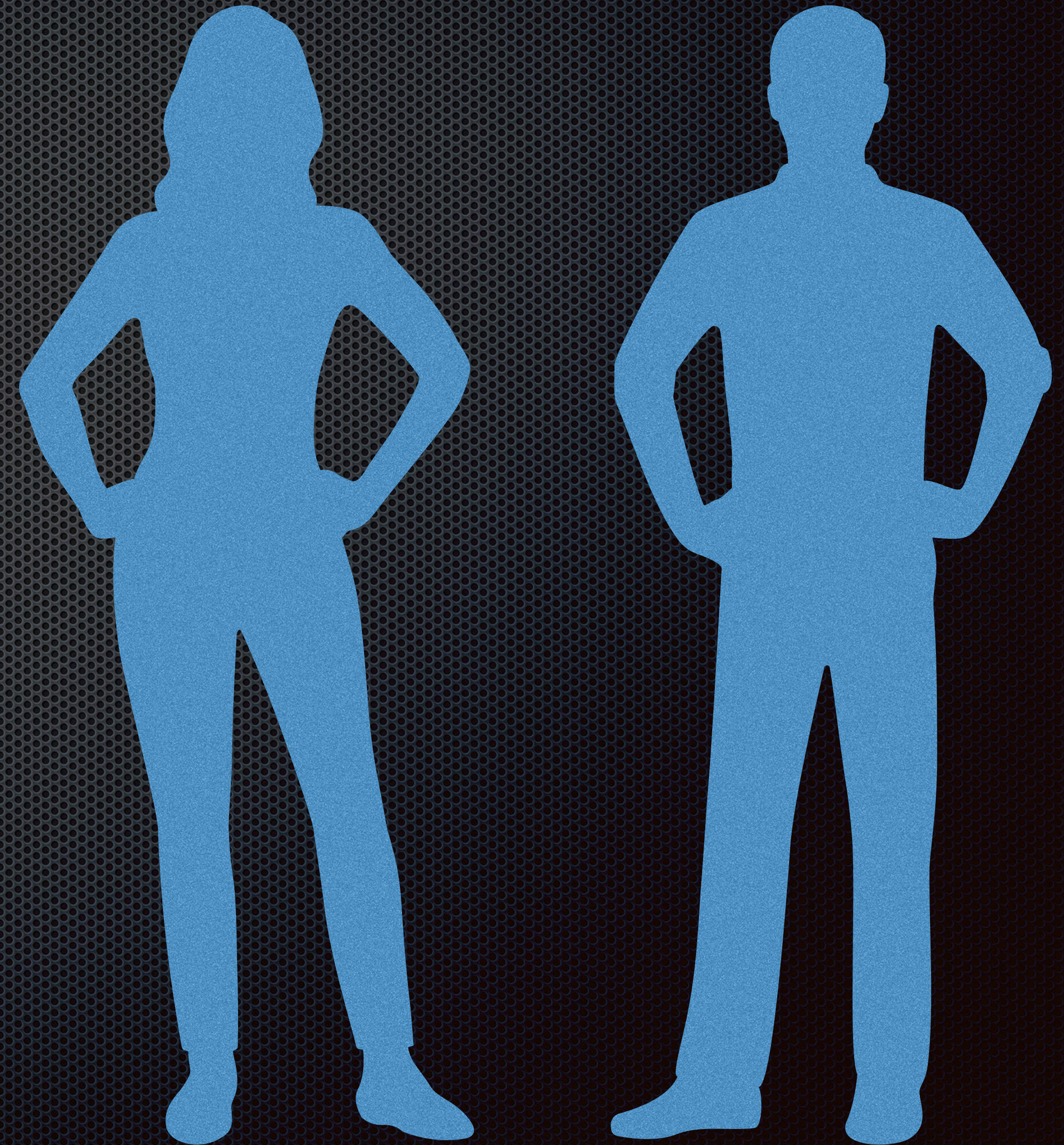
It is not a matter of devising such an experiment with futuristic scientific advances. Rather, the terms of such a threshold are unfalsifiable.

# Practical application of stream of consciousness identity

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Assume that in the future, this threshold is determined\* to be 12°C. Hospitals could employ it to assign identity to patients.

Two rapid frigid drowning patients arrive at the ER, Alice and Bob.



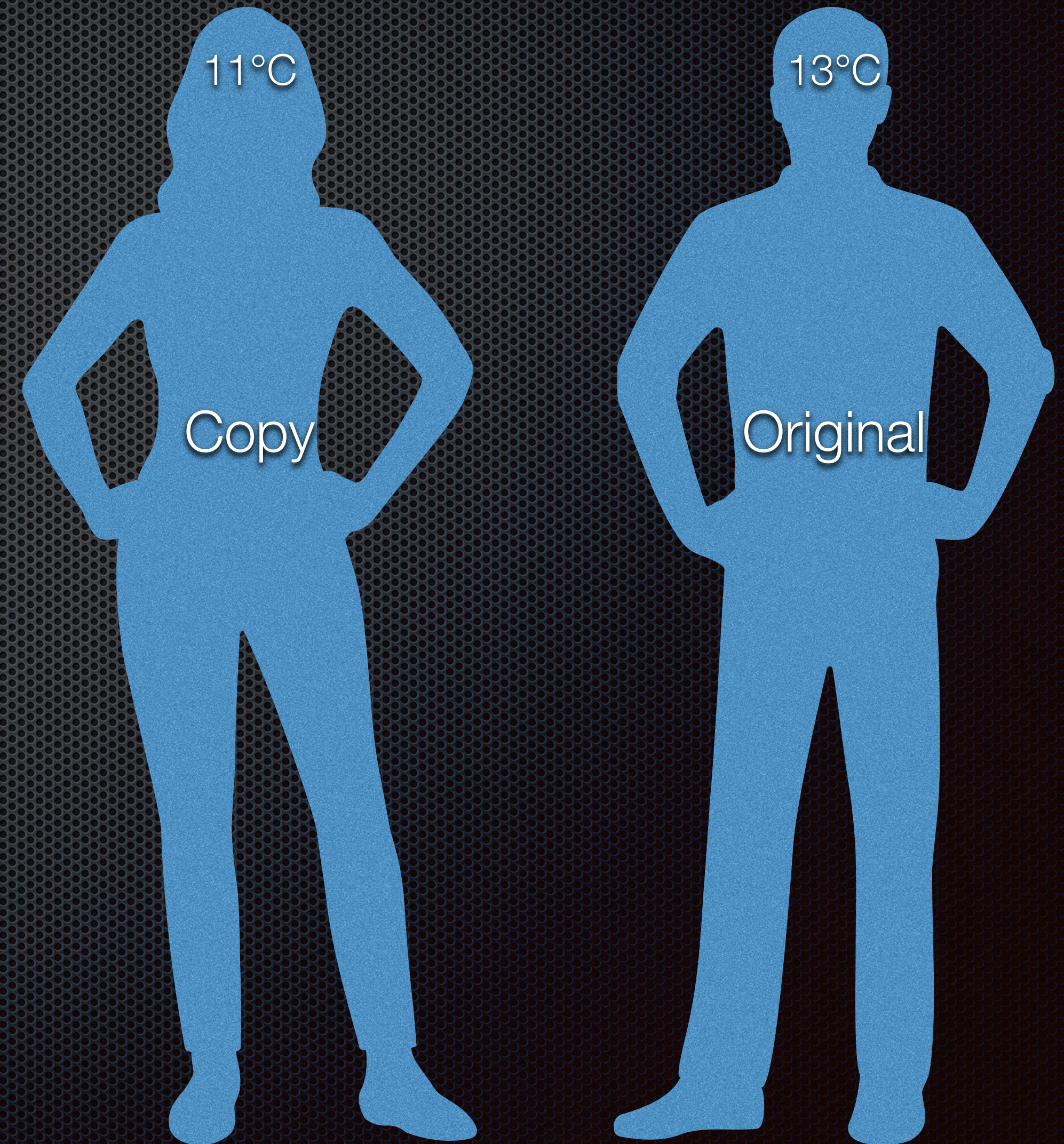
\*Remember, this is empirically impossible, so the following scenario is just bad sci-fi.

# Practical application of stream of consciousness identity

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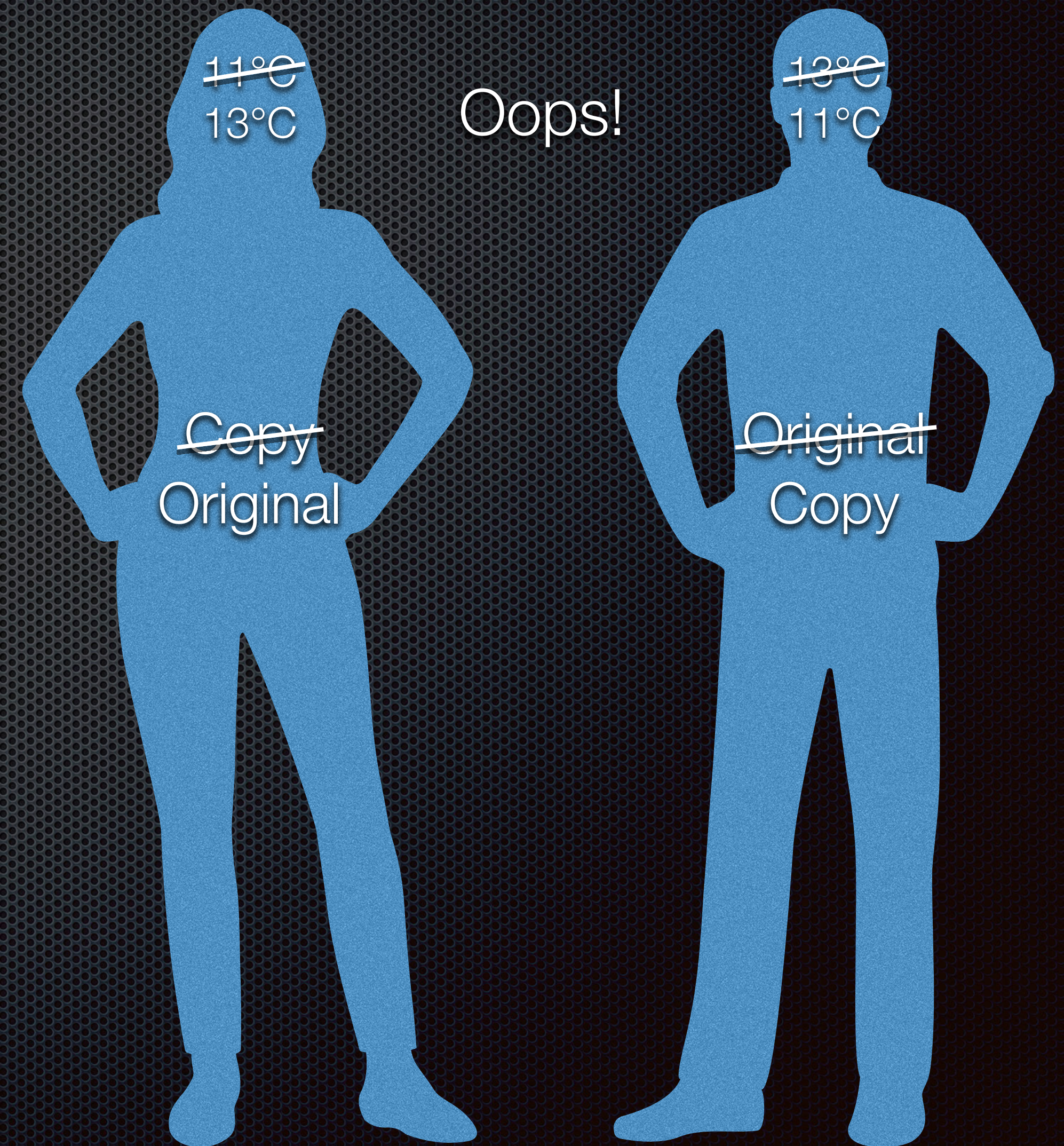
Both are revived,  
Alice from 11°C and  
Bob from 13°C.

Alice is branded a copy for the  
rest of her life. Being a committed  
SCP herself, she accepts this  
fate, perceiving herself as a copy  
for all her remaining days.



# Practical application of stream of consciousness identity

Decades later, someone examines the medical records and discovers that both temperature readings were incorrect. Alice only descended to 13°C, but Bob reached 11°C.



Both Alice and Bob, as well as everyone who knows them, have judged both their identities incorrectly for decades.



# Practical application of stream of consciousness identity

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According to the SCP theory, both Alice and Bob, as well as everyone who knows them, have judged both their identities incorrectly for decades.

If determining identity is both unverifiable\* and without practical implication for people's sense of one another's identity (or their own identity!), then why continue to believe in identity replacement at all?

\*In fact, it was shown earlier that even devising the threshold for such a test is unfalsifiably impossible.

# Conclusion

If SCPs are wrong about this issue, they are rejecting the SaC MU procedure, which is far more likely to actually be possible than GIPR.

Even if both are possible (GIPR is highly unlikely)  
SaC will still become technically feasible  
decades, if not centuries, earlier than GIPR.

# Conclusion

The problem with the SCP argument is not only its reliance on unfalsifiable beliefs or its incompatibility with our treatment of current real-world medical patients.

(although those are very serious problems)

It also risks that SCPs living during the intervening time period between the development of SaC and GIPR will needlessly die due to their dismissal of SaC.

# Conclusion

And besides, even if one isn't interested in futuristic topics like mind uploading, we should at least strive for worldviews and personal philosophies that aren't unfalsifiable.

# Conclusion

Please consider reading the accompanying paper in its full length.  
No set of slides can cover a topic as thoroughly as a complete article.

*The Stream of Consciousness and Personal Identity*

Keith Wiley

2019

<http://keithwiley.com/mindRamblings/mindUploadingStreamOfConsciousness.shtml>

# Keith Wiley's related writings

## ■ Books

- \* *A Taxonomy and Metaphysics of Mind-Uploading*  
(2014) Available on Amazon: <https://www.amazon.com/dp/0692279849>

## ■ Papers & Articles

- \* *The Fallacy of Favoring Gradual Replacement Mind Uploading Over Scan-and-Copy*  
(2016) Coauthored with Randal Koene, published in the *Journal of Consciousness Studies*  
Available on arXiv: <https://arxiv.org/abs/1504.06320>
- \* *Mind Uploading and the Question of Life, the Universe, and Everything*  
(2015) <http://keithwiley.com/mindRamblings/questionOfEverything.shtml>
- \* Many other articles available at:  
<http://keithwiley.com/mindRamblings.shtml>

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