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FROM MIND TO MACHINE:

BCI-Generated Works and the Erosion of Human Authorship in EU Copyright Law

>_ PROPOSITION.MAIN

EU copyright law is built on the idea
that a protected work reflects **a human personality**,
expressed through **free and creative choices**.

>_ PROPOSITION.COUNTER

Brain-computer interfaces **challenge this foundation**.

// THESIS.MAIN = TRUE

EXECUTION SEQUENCE.

// four modules, from technology to consequence

§01

TECHNOLOGY

What BCIs are, and the three categories that matter for copyright.

§02

PATTERN

How copyright has historically accommodated new creative technologies.

§03

EU FRAMEWORK

Where EU originality doctrine stands today, and why it is anthropocentric.

§04

CONSEQUENCE

Why BCI-generated works create a deeper problem than previous technologies.

§01

What are brain-computer interfaces?

A direct communication channel **between the brain and an external device.**

> HISTORY

The concept is not new.

Jacques Vidal coined the term *brain-computer interface* at UCLA in 1973. For most of the half-century since, BCIs remained largely confined to laboratories and clinical research.

That is no longer the case.

> CURRENT STATE // 2026.01

- **NEURALINK**
  21 human trial participants worldwide,
  7 at UCLH London
- **SYNCHRON**
  first mind-composed social media message,
  Philip O'Keefe, 2021
- **CONSUMER EEG**
  Emotiv · OpenBCI · Muse
  headsets €200 to 2,000, used by artists

NOT ALL BCIs ARE LEGALLY EQUIVALENT.

// three categories. only one creates the doctrinal problem.

01

MOTOR-CONTROL

BCI as input device

User controls cursor, brush, or tool through neural commands.
Human makes the expressive choices.

COPYRIGHT.HANDLES

02

SEMANTIC DECODING

Reconstruction from signal

System reconstructs words or images through deterministic mapping.
Shrinking category in the literature.

TRANSITIONAL

03

GENERATIVE DECODING

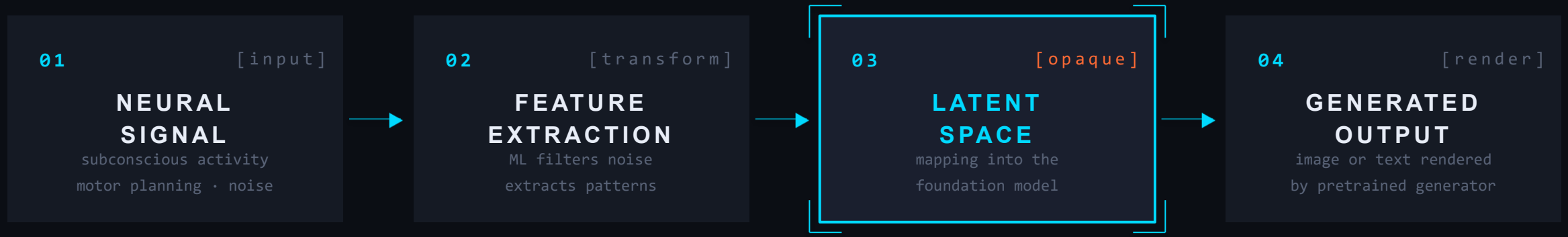
Foundation models in the loop

Brain signal conditions Stable Diffusion or an LLM.
The model contributes substantial content of its own.

FOCUS.OF.ARGUMENT

WHY CATEGORY 03 INVOLVES A BLACK BOX.

// the AI layer is opaque: model contributes its own expressive content



OBS.01

The foundation model is trained on millions of images, and contributes substantial content of its own.

OBS.02

The user cannot see which alternatives the model considered, or why certain details appeared.

OBS.03

In the researchers' own terminology, the system hallucinates to fill in what the brain signal does not carry.

§02

How copyright adapted to technology.

EACH TECHNOLOGY WEAKENED THE HUMAN ROLE.

// each time, copyright adapted. the human element kept relocating.

PHOTOGRAPHY

from execution to prior choice

Burrow-Giles · Painer C-145/10

SOFTWARE

from personality to intellectual effort

Dir. 91/250/EEC · Art. 1(3)
Later the same test applied for all categories of works (Infopaq C-5/08)

AI-ASSISTED

from authoring to selecting at any stage

Hugenholtz & Quintais

BCI

from human choice to brain capture

> this argument

Painer v Standard VerlagsGmbH

[CJEU] CASE C-145/10 · 2011 · PARA.92

> *By making those various choices, the author of a portrait photograph can stamp the work created with his personal touch.*
>
> // Painer, paragraph 92

› THE.MOVE Authorship is relocated from the click of the shutter to the prior exercise of choice.

THE LOCATION OF HUMAN CREATIVITY KEPT MOVING.

§02.3.A

INFOPAQ

[CJEU] C-5/08 · 2009

the author's own intellectual creation

Treated as evidence of a single autonomous EU concept of originality, applicable across all categories. The human author remained at the centre, but the test had been raised to a higher level of abstraction.

§02.3.B

AI-ASSISTED OUTPUT

Hugenholtz & Quintais · 52 IIC 1190 · 2021

"creative choices by a human being at any stage of the production process"

A reassuring proviso. Each accommodation chipped at the human element while preserving the formal vocabulary of human authorship.

EXECUTION → CHOICE → INTELLECTUAL.CREATION → CHOICE.AT_ANY_STAGE

§03

The EU copyright framework today.

Cofemel + Brompton

[CJEU] C-683/17 / 2019 · C-833/18 / 2020

> *"It is both necessary and sufficient that the subject matter reflects the personality of its author, as an expression of his free and creative choices."*
>
> // Cofemel ¶30 · repeated verbatim in Brompton ¶23

> TEST.FAILS_WHEN *"technical considerations leave no room for creative freedom."*

EU LAW PRESUPPOSES A HUMAN AUTHOR.

// three structural commitments. all anthropocentric.

§03.2.A

BERNE

People, not machines

The text and structure of the Berne Convention presuppose human authorship. Lack of human authorship disqualifies an output from Berne subject matter.

// Ginsburg, 49 IIC 131 (2018)

§03.2.B

CHARTER

Reward for creative work

Recital 10 InfoSoc frames copyright as a reward for the creative work of authors. Charter Article 17(2) elevates IP to a fundamental right rooted in human authorship.

// Directive 2001/29 · Charter Art. 17(2)

§03.2.C

NO ESCAPE

Unlike the UK, no §9(3)

EU law has no equivalent of the UK rule that deems the author of a computer-generated work to be the person who made the necessary arrangements.

// CDPA 1988 §9(3), refused by EU doctrine

"Pope Julius II commissioned the Sistine Chapel."

"Michelangelo painted it."

The question BCI raises is whether even Michelangelo would be considered the author.

// after Ginsburg, People Not Machines, 49 IIC 131 (2018)

§04

Why BCI changes the problem.

BCI ERODES EU COPYRIGHT DOCTRINE IN FOUR WAYS.

// four parallel vectors. cumulative consequence.

01 // CHOICE

Free and Creative Choice

The Painer/Cofemel test assumes deliberative agency. BCI signals include subconscious activity. Between intent and artefact, no chain of free creative choices.

02 // PERSONALITY

Personality

BCI output is biometrically unique, yet stylistically the foundation model's. The expressive personality the case law contemplates is replaced by biometric provenance.

03 // EXPRESSION

Idea and Expression

The deliberative gap between thinking and expressing collapses. With no gap, the dichotomy that structures copyright has nothing to hold on to.

04 // AUTHORSHIP

Human Authorship Itself

The legal category of the human author is losing its referent. The form of authorship survives; the substance behind it is gone.

NO ROOM FOR CREATIVE FREEDOM.

// the pipeline, examined:

WHAT.BRAIN.PROVIDES

- subconscious activity
- motor planning
- noise, drift, fatigue
- involuntary processes

WHAT.AI.ADDS

- statistical hallucination
- training-data styles
- latent-space interpolation
- rendering choices

WHAT.USER.CHOSE

- the initial intent
- the moment of capture
- . . .
- . . .

> COFEMEL.¶31 / BROMPTON.¶24 *originality fails where constraints leave no room for creative freedom.*

WHERE DO THE CREATIVE CHOICES ACTUALLY COME FROM?

// gervais: trace the causation. find the threshold.

> ABOVE.THRESHOLD

Machine-caused creative choices.

// the output falls outside authorship. on gervais's analysis, it belongs to the public domain.

◆ AUTONOMY.THRESHOLD ◆

> BELOW.THRESHOLD

Human-caused creative choices.

// the output is authored. copyright protects it.

THREE RESPONSES, EACH WITH A COST.

// select.option:

> OPTION.01

[STRETCH]

Interpretive stretching

Continue finding small traces of human input and treating them as sufficient authorship.

// Human authorship becomes a legal fiction.

> OPTION.02

[RESTRUCTURE]

Restructure originality

Raise the originality threshold to require stronger evidence of human creative control.

// Doctrinally coherent, politically improbable.

> OPTION.03

[SUI GENERIS]

Separate *sui generis* regime

Protect BCI output as economic value, without pretending it satisfies authorship.

// Realistic. Aligned with neurorights conversation.

A COPYRIGHT LAW THAT PROTECTS EVERYTHING EMERGING FROM A BRAIN

may ultimately stop protecting anything distinctively human.

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LEGAL DISCLAIMER

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