Overview

Neuroethics and law will increasingly confront forensic uses of brain data. State actors may soon attempt to predict recidivism or detect memory via multi-voxel pattern analysis (MVPA), an algorithmic neuroimaging data processing method. Legal scholarship on the problems of forensic science methods (e.g., fingerprinting) has documented lack of validation studies, undue structural advantages in litigation, and intersections with systemic disadvantages faced by racialized or otherwise marginalized litigants. The neurolaw and critical evidence-based forensics literatures are well-positioned for active mutual support. Currently, however, neither stream of scholarship regularly cites or engages with the other. Neuro-forensic miscarriages of justice are preventable; towards this end, we should jointly urge a rigorous approach, encompassing dedicated regulatory bodies and asymmetric evidentiary rules.

Why a rigorous approach for inculpatory forensic evidence?

These scales should tilt in defendants’ favour ...

- Presumption of innocence
- Routine neglect of validity
- Proof beyond reasonable doubt
- "Slippage" of expertise (e.g., clinical podiatry to forensic gait analysis)

... but superior State access to expertise, via its repeat-player relationship, can effectively dilute its rightfully heavy burden of criminal proof.

How might (neo-)forensic methods help reproduce structural inequality?

Outsize mobilization of forensic tools against crimes of poverty & disadvantage

Unregulated exercise of subjective judgment embeds biases of forensic experts

Brain claims displacing social context as authoritative means of knowing a person

Machine learning obscures interpretability & reliability of techniques like MVPA

What might rigour look like? Don’t evidence rules already demand it?

Even as unreliable forensics remain a key factor in wrongful convictions, US & Commonwealth law purport to require reliable expert methods ...

Independent forensic science regulatory bodies or non-governmental consortia

Explicit requirements for evidence-based proof of foundational and as-applied validity

Targeted exclusionary rules for MVPA-based forensics until reliability & interpretability improve

Beyond reasonable doubt* stays meaningful

... but courts are institutionally ill-positioned to be sole arbiters of validity, & foundational validity is often inferred from prior use rather than proven.

The Expert Persuasion Expectancy (ExPEx) Framework could better guide courts & regulators

Foundations: Does training, study or experience in the field F support assertions like A?

Field: Does witness W have training, study or experience in the field F?

Specialty: Does W have training, study or experience specific to assertions like A? [1]

Ability: Does W provide assertions like A accurately and reliably?

Opinion: Does W convey A clearly, and with necessary qualifications?

Support: Does W rely on evidence in making A?

Consistency: Is A consistent with what other experts assert?

Trustworthy: Is W personally reliable as a source?

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