



The Return Of The Criminal Face: Algorithmic Policing And The Revival Of Discredited Criminology

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ABSTRACT

The facial-recognition technology, tightly integrated into modern policing procedures, has the appearance of being a dispassionate and objective enhancement of the investigative potential. Yet, at the heart of its veneer of computation, there is an underlying epistemic continuity with the discredited tradition of appearance-based criminology. In history, the effort to tell criminality by its physical appearance and most famously with Lombrosian physiognomy, collapsed due to its methodological weaknesses and inherent biases. However, in an altered form of this, the same inferential logics are reborn as algorithmic systems that translate facial features into probabilistic identifiers and suspects.

The implementation of facial recognition in policing in India illustrates how the output of algorithms, despite being framed as statistical correlations, is realised as categorical truths. This is not only a technical change, but an institutional one- the probabilistic matches are promoted to actionable suspicion, usually without questioning the error rates or bias of the dataset and the validity of the methodology. By doing this, such systems pose the danger of formalising historical trends of over-police and social marginalisation into the very fabric of law enforcement.

Placed in the shifting regulatory context of the Bharatiya Nagarik Suraksha Sanhita, 2023 and the Bharatiya Sakshya Adhiniyam, 2023, the article reveals a significant regulatory loophole- although both laws enable the admission and growth of digital evidence, they are conspicuously silent on the standards of algorithmic reliability, transparency and accountability. However, eventually, the uncritical embrace of algorithmic policing can become a threat to the institutionalisation of a new kind of technologically mediated prejudice. A paradigm shift is required, shifting from uncritical adoption to principled regulation and making it clear that the legitimacy of criminal justice is not to be found in automation but in its adherence to constitutional values of fairness, accountability and justice.

KEYWORDS

Algorithmic Bias, Facial Recognition Technology, Digital Evidence, Physiognomy, Procedural Fairness, Constitutional Accountability

1. INTRODUCTION

The Delhi Police in 2022, revealed in a Right to Information reply, that during criminal investigations, facial-recognition matches that show an equal to, or more than 80% match, are considered as “positive” results¹.

In the past decade, Facial-recognition systems have ceased to appear as experimental concepts and have become one of the tools of policing in India. In Uttar Pradesh, Telangana and Delhi, police forces deploy automated recognition systems to recognize demonstrators, scan the crowd and trace suspects, which implant a new algorithmic vision within the conventional criminal process. However, the implementation of automated facial recognition in India, steps into a world that used to believe in anthropological criminology- a world that was shaped by the debunked works of Cesare Lombroso’s physiognomics: where the face was the map of criminality².

The similarity is not one of doctrine, but of form. Although the modern algorithms used in facial recognition do not profess that criminals appear in a certain manner, they are trained on datasets that recreate past patterns of policing, visibility, and marginalisation. As these systems encode facial geometry into probabilistic identifications, it means that they can recode an appearance-based suspicion, which may appear to be a dispassionate computational process. Ironically, a modern investigative instrumentation might be reviving the same beliefs that scientific criminology began discarding a century ago.

This article critically analyses, whether the Indian Criminal Justice System, is unintentionally allowing a modern technology-driven appearance-based prejudice? Procedural architecture in India, especially after the Bharatiya Nagarik Suraksha Sanhita, 2023 (“BNSS”)³ and the Bharatiya Sakshya Adhiniyam, 2023 (“BSA”)⁴, paves the way of digital forensic, although with scant coverage over the unreliability, prejudice, or error rates of algorithmic evidence.

¹ *Delhi Police in RTI reply: 80% match in facial recognition is deemed positive ID*, Indian Express (Aug. 17, 2022), <https://indianexpress.com/article/cities/delhi/delhi-police-rti-reply-80-pc-match-facial-recognition-deemed-positive-id-8094324/>

² CESARE LOMBROSO, *Criminal Man* 1–23 (Mary Gibson & Nicole Hahn Rafter eds., 2006).

³ Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023.

⁴ Bharatiya Sakshya Adhiniyam, No. 48 of 2023.

This article explores the history of appearance-based criminology, assesses scientific risks of the current AI systems, examines the regulatory gap in India and suggests a model of rights-sensitive application of algorithmic forensics.

2. OLD IDEAS IN NEW SKIN: AI and the Return of Discredited Criminology

2.1. PHYSIOGNOMY TO PROBABILITY: The Persistence of Inference by Appearance:

The belief that individuals can be judged as being criminals based on their face, has a troubled intellectual history. The criminal anthropology of the nineteenth century, best exemplified by Cesare Lombroso, was aimed at identifying the “born criminal” based on measurable anatomical deviations: protruding jaws, asymmetrical skull, deep button-like eyes and others which were treated as living traces of evolutionary regression . Despite the sheer power that it wielded at the time, the theory failed under the pressure of methodological fallacy and moral indictment that its data was strongly biased, its causal assertions weak and its conclusions entrenched racial and class prejudice into the field of science .

However, the appeal of transforming appearance into inference never has vanished altogether. The most enduring feature of physiognomy is the claim that human faces would become surfaces of information. Modern systems are based on the concept of deep learning architectures that embed inline facial features into high-dimensional algorithms rather than the phrenological scales. These algorithms are not construed as moral indicators but as indicators of similarity; however, their working has an uncomfortable structural similarity to the logic of the older anthropological criminology.

Machine-learning models do not assume an existing type of criminal, as opposed to Lombroso. Rather, they train on statistical relationships coded by compilations of existing visual data. Yet, since any such corpus are records of social exposure, policing, and representation, they bring the same skew patterns to the algorithm that distorted physiognomic reasoning. In the case where over-policed communities are over-represented in the criminal databases, and under-represented groups are represented infrequently or with subpar imaging conditions, the internal geometry of the model starts favouring specific faces as normative than others and becomes more prone to error.

The failures of physiognomy thus replicate, not as ideology outright, but as property that develops. The failure of physiognomy was due to the situating of correlation as essence; late facial-analysis algorithms run the risk of a similar situation by situating representational bias as accuracy. AI inherits the epistemic frailties of his approach: that the face is a measured representative of something other, such as identity, or deviance. In the modern systems, it is done in a probabilistic way: a face is reduced to a vector and the comparison to a database is performed to determine the probability of a match. However, within the context of operations, particularly in the context of policing, probabilistic matches are typically considered categorical truths. The officers can interpret the output of an algorithm as a discrete signal, instead of statistical hypothesis, when an algorithm determines a probable match. Risk therefore, does not reside in the intention of the model but in the institutional meaning of its outputs.

2.2. INVISIBLE STIGMATA: Algorithmic Bias, Distribution of Error & Institutional Harm:

The change stated above, is reflected in the idea of the invisible stigmata. Criminality expressed physically by Lombroso as observable abnormality in individuals now becomes a problem of mathematical distance in the form of an algorithm. When lighting, camera angle or skin tones add noise to the depiction of some groups, the resulting embedding space will put them further away, relative to the so-called centre of the distribution, learned by the model. This increases the number of false identifications of the groups most poorly represented by training datasets. A 2019 release by the National Institute of Standards and Technology has identified just this pattern: equivalent demographic differences based on false-positive rates among algorithms exist; with darker-skinned individuals as well as female participants showing higher false-positive rates .

The effect of this phenomenon is a computation analogy to physiognomy. Rather than pronouncing some faces as natural deviants, the system creates a world where there are those faces that are statistically riskier, more likely to be misclassified, creating friction with investigations. The damage is not figurative but functional: as police consider algorithmic proposals as tips, the imbalanced distribution of errors of the algorithm predisposes specific

groups of people to unfair and unjustified suspicion. This way, the model poses an appearance-based risk despite not claiming appearance-based culpability itself.

Physiognomy did not lose its credibility simply because it was racist or reductionist, it lost credibility only because it confused socially constructed correlations with biological facts. Algorithms run the risk of repeating that error when they assume the contingencies of imaging and data collection to be constant elements of identity. An artificial criterion which persistently detects a rural-origin, darker-skinned subject more often, is not finding any natural defect in the face of the subject; it is finding its own provincial vision.

Furthermore, the scope of physiognomy is expanded in two aspects by AI. First, its decisions are fast and generalisable: a single algorithm is able to match millions of faces per second, increasing the field of potential suspicion well beyond human ability to scrutinise. Second, its rulings are unintelligible. Where the assertions of Lombroso can be argued and contradicted, the statistical geometry of a neural network is non transparent to those targeted by it. People have no grounds to challenge the way their faces are depicted or why they have been flagged, the reasoning is buried somewhere in layers of computation that are not always comprehensible to both defendants and courts.

Lastly, the analogy gets reinforced by the institutional adoption of AI. Police culture in the 19th century came as a result of criminology, which influenced officers to perceive deviance in some bodies. Algorithms systems have influenced the modern policing culture by motivating officers to believe in machine-calculated similarity ratings. In either of the two, the face is a predictive surface but with different reasons. What remains continuous is the change of appearance into criminal suspicion, that had earlier been interpreted by spurious anthropology and is subsequently being interpreted by blemished mathematics.

Provided that modern systems can duplicate physiognomic results without physiognomic motive, then legal protection should be directed at the mechanisms and not the motive. Rejection of the ideas of Lombroso is not sufficient; the law must reject institutional practices that permit algorithmic systems to create functionally similar harms.

3. THE CLASSICAL POSITIVIST ZENITH: COMMAND, COERCION, AND THE UNDIVIDED SOVEREIGN

The criminal procedure system in India has entered new era of technological growth. The “BNSS” and the “BSA” were written with a distinct goal in mind: to simplify the investigations, modernise the evidence search and capture, and introduce digital tools to the daily working of the police. In theory, this is an indication of institutional advancement, but in reality, it introduces an enabling architecture that allows algorithmic systems to be embraced prior to the comprehension of their hazards. The scaffolding that envelops digital evidence is therefore strong in its scope, but weak in design- the scaffold allows the police to deploy technology, but it does not dictate the way in which this technology would be assessed.

The first characteristic of this landscape is its excessive technological orientation. The “BNSS” broadens the application of electronic practices throughout the chain of investigations: searches should be audio-video recorded; electronic communication gadgets can be confiscated easier; serious crimes require forensic teams⁵. These provisions not only modernize the process but also condition the fact that the process of collecting images, videos, and biometric data is becoming a routine aspect of investigation. However, as “BNSS” reinforces the provision of digital evidence, it has made an unusual silence as to how downstream evaluators, such as a court, forensic laboratory, legal counsel, should interpret algorithmic outputs of such evidence. The outcome is a procedure, which presupposes that digital inputs will be correct without evaluating their accuracy.

This presumption is more evident in the handling of electronic evidence under the “BSA”. Identifying electronic records as key evidence where they have been obtained from proper custody⁶, the “BSA” eliminates a hurdle that often, made admissibility difficult in the previous regime of the old Section 65B certificate⁷. Reform is reasonable: digital evidence has become widespread, and the formalities of the process should not be in its way. Nonetheless, there is a structural implication of the transformation. With the digital evidence proving to be more admissible, the courts might more readily accept the products of algorithms, like a face-recognition match, with less procedural encumbrance. The “BSA” does not mandate

⁵ *supra* note 3.

⁶ *supra* note 4, § 61.

⁷ Indian Evidence Act, No. 1 of 1872, § 65B (India).

demonstration of reliability, error or statistical validity of the algorithmic procedures; nor does the “BSA” demand that parties reveal whether the model applied has been independently tested, audited or certified. The law has unintentionally provided doctrinal leeway in elevating convenience, as courts have come to accept algorithmic evidence without any knowledge of how it was generated.

This brings us to the second characteristic of the framework, which is a presumption of neutrality. In Indian evidence law, instruments of measurement, such as breath analysers, ballistic reports, fingerprint comparisons are treated as products of objective science. Courts may question procedural failures, but not often question the methodology. This assumption now rubs onto the output of algorithms, despite the fact that the mechanics of machine-learning systems are radically different to other traditional forensic sciences. Fingerprints and ballistic pattern are based on physical characteristics, whereas, AI-computed similarity scores are based on statistical generalisations made using opaque data sets. It is a category mistake to consider both as similar types of evidence, scientifically, but the law remains silent on this distinction.

The third aspect consists in the total lack of validation criteria of AI-driven tools. Both “BNSS” and “BSA” do not indicate how the police should test or validate algorithmic systems prior to deployment. The Daubert Standard⁸ in the United States sets the standard that demands courts to examine peer review, error rate, and methodological soundness, of algorithmic systems. The standard does not take the form of a set of questions which are to be followed but rather a more open and flowing investigation aimed at ensuring that unreliable science does not gain the benefit of judicial legitimacy. It is important because it acknowledges the fact that scientific authority is not vested in the institutional use but in methodological good sense. However, The Indian system has no statutory equivalent of the Daubert standard. Indian courts have at times disregarded evidence on the basis of unreliable forensic procedures; however, they are interventions specific to cases rather than a systematic admissibility doctrine. The absence of such equivalent leaves algorithmic forensics in the state of procedural exceptionalism: it is possible to utilize tools, but their scientific load is not described. Even under conditions, where the courts consult an electronic evidence Examiner⁹, the statute does not define that examiners verify demographic bias, performance standards, or reproducibility of an algorithm.

⁸ Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579 (1993).

⁹ *supra* note 4.

The fourth characteristic relates to the opacity around the adoption of AFRS (Automated Facial Recognition Systems) and other systems by police. No detailed public registry exists that names what policing units subscribe to Facial Recognition Technology, on what terms, with which databases and under which control mechanisms. Orders on the technical specification, or on the accuracy rate, are disregarded or bypassed, on security grounds. Consequently, the courts and litigants will be unable to determine whether or not the algorithm was tuned correctly, the database was up to date and whether or not the match thresholds of the system were manipulated in the course of its operation. The lack of transparency compromises the principle of adversarial testing: it is impossible to challenge what one cannot observe. This lack of transparency is particularly disturbing since facial-recognition systems are not neutral detectors; the results of the system are significantly affected by the way in which training sets were made, the thresholds were established, and false matches were addressed. In the absence of this information, courts cannot have a meaningful opportunity to determine the reliability of an identification.

Lastly, the fifth characteristic is that the judiciary is comparatively silent with regards to algorithmic evidence. Especially, after *K.S. Puttaswamy v. Union of India*¹⁰, which established the proportionality test for state intervention, Indian constitutional jurisprudence has strongly started acknowledging vigorous privacy rights and procedural protection. However, although this framework may be an effective instrument to evaluate algorithmic systems in terms of necessity, adequacy, and non-arbitrariness, courts have yet to make it operationalised in the Indian forensic environment, as facial recognition litigation is more likely to be concerned with harm to privacy and surveillance, rather than to evidentiary reliability.

Consequently, the judiciary has not presented guidelines that would indicate the manner in which algorithmic identifications ought to be handled during the investigation or the trial stage. Are they to be considered corroborative leads, tentative pointers, or prima facie evidence? Lack of doctrinal guidance gives the police the freedom to convert probabilistic information into actionable suspicion and to subject defendants to systems whose scientific soundness has not been reviewed.

¹⁰ *K.S. Puttaswamy v. Union of India*, (2017) 10 S.C.C. 1.

Combined, these characteristics show that there is a complex regulatory vacuum. The legal framework in India provides police with incentives to use Facial Recognition Technology quickly and the police have formal authority to obtain digital evidence, it is easy to admit in Court, the presumption of cultural impartiality prevails and there is virtually no obligation to objectively proofread or explain the use of this tool, even though it is being used. Effectually, the law has constructed an algorithmic tool highway without constructing guardrails to restrict its abuse. This generates a form of structural asymmetry in the sense that advantages of speed and automation are enjoyed by the state, the dangers of making mistakes or being biased are faced by individuals, particularly those who belong to the groups traditionally experiencing disproportionate policing.

The irony here is clear, as the new procedural codes are developed as tools of modernisation, their silence, in fact, brings nineteenth-century epistemic weaknesses into the sphere of law enforcement in the twenty-first century. Any investigative system founded upon digital evidence, without determining scientific criteria, is liable to suffer the same fate that the discredited criminology, accomplished through pseudo-science, namely the production of appearance-based suspicion by technology. The failure of law to control the terms of the algorithmic truth turns it into a channel of algorithmic error

4. THE ILLUSION OF OBJECTIVITY: How AI Turns Bias into Evidence

The facial-recognition technology (“FRT”) is frequently justified as a scientific enhancement of the human eye: it is quicker, more reliable, is not subject to fatigue, and does not carry the burden of conscious bias. This is a defence based on the rhetoric of automation which presupposes that algorithmic tools view the world in a mechanically neutral way. However, the technical fact tells a different story. “FRT” systems do not perceive in any human meaning, they work by deriving mathematical vectors of the images and matching them to statistical representations created with available datasets. When the datasets are lopsided, historically imbalanced or demographically skewed, then the system that is being built is inherently with a perverted vision. What is created is a kind of machine myopia - a pattern of error that is cast in the form of technology but replicates profound social inequalities.

This machine myopia is most extreme when it comes to one-to-many searches, which is the most applicable mode of policing. The algorithm is used to identify a probe in thousands or

millions of registered faces in identification tasks. Any slight demographic bias of training data is amplified in the process. This effect is reflected in the landmark National Institute of Standards and Technology evaluation documents, where in some algorithms false-positive scores on African-American and Asian individuals are often thousands of times higher than on white individuals¹¹. Overlaid on the Indian social realities, where skin colour, light, and unequal photographic reproduction occur between caste, class, and region, the disproportionate harm is even larger.

The threat exists in the fact that mistake made in facial-recognition systems are not mistakes, but pieces of evidence. In criminal investigation, an algorithmic match is seldom considered as a provisional assumption. When a system has returned a possible match, officers are prone to consider it as a significant clue, particularly when the system displays the similarity score ranks or a face containing a green-bounding-box (a visual frame used in computer vision and design to outline objects, often signifying a ground truth). The psychological impact of it is potent: humans excessively trust the work of algorithm, especially when it is introduced as something modern or scientific. The behaviour is sometimes referred to as automation bias and it changes a statistical suggestion into an investigative directed lead. The step to a coercive measure is terrifyingly close, from there.

There is no hypothetical nature of this transformation of error into arrestable suspicion; it is structural. The police procedures, in particular fast-paced investigation, usually focus on leads that seem solid. A face back produced by an algorithm is more real than an anonymous tip. After this, officers assign investigative resources to affirming the choice made by the algorithm, which inverts the burden of doubt: the suspect is no longer an individual who needs to be exonerated but instead he or she is someone who needs to be proven innocent. What initially seems the probabilistic output is a quasi-forensic identification even in the instances where the error rates are unknown. In this regard, “FRT” is not just wrongly identifying people, rather it is forging investigative paths.

The consequence of this force is a subtle yet dramatic shift: appearance becomes risk. Not that certain faces are suspicious in nature but the system is saying that certain faces have a higher likelihood of error. Regarding the under-represented demographic groups, or rather the images

¹¹ *supra* note 7.



of people whose images were recorded with the use of low-quality cameras and bad lighting, the chances of being flagged also increase. The algorithm does not categorize them as criminals- they are brought to a higher level, near suspicion. It is the thing that makes contemporary “FRT” some kind of repackaged physiognomy. In contrast to old criminology, which determined that the body revealed criminality, the modern systems declare that a body in the form of its computational representation influences the probability of erroneous recognition. The process is different; the result is a rhyme.

When a technology has become a part of normal operation procedures, then it becomes ordinary to use it. Routine obscures scrutiny. Thresholds cannot be questioned by officers; admissibility cannot be questioned by courts and deployment cannot be questioned by policy makers. This is where the algorithmic systems are no longer merely a tool but they are an infrastructure. The effects of which are, infrastructure does not stop functioning when failure is reported, given that the infrastructure is a normal element in the daily running of the criminal justice system. Not only can it be biased in this environment but it becomes entrenched.

The technical threat is even further escalated by cases in which courts are presented with evidence based on facial-recognition that lack clear statutory or doctrinal protection. Under the “BSA”, electronic records may be used as primary evidence as long as they are created in a state of proper custody¹² and that nothing in the statute expressly distinguishes algorithm sources of other types of digital documentation. By accepting an algorithmic identification without inquiring into the rate of error or the methodological principles of the algorithm, the courts unwittingly permit the transformation of probabilistic appearance-based comparisons into evidence that is sanctified by the court.

Adversarial testing is also undermined by the opaqueness of “FRT”. There is no meaningful way that defendants can object to the basis of an algorithmic match without the training data, the model architecture, or decision logging. However, trade secrecy is often cited by vendors when they do not want disclosure. This generates an asymmetry: the state can use an obscured device, whereas the person who is subject to that tool does not have an opportunity to analyse or dispute its rationale. This kind of asymmetry does not only violate evidentiary fairness, but

¹² *supra* note 9.

the need for procedural safeguards in cases relating to Right to Privacy, as stated in the *Puttaswamy*¹³ judgement.

Lastly, objectivity is an illusion that hides the social effect of the technology. There are no neutral distributions of algorithmic errors; they tend to follow historic dimensions of marginalisation. The danger of disproportionate misidentification is high in India where photographic exposure is characterized by caste, religion, skin colour, and urban–rural difference. The reason is that “FRT” systems are likely to malfunction more in people of communities with less online presence. In this way, algorithmic bias is another channel of inequality the criminal justice system is not encoded to spot or address.

The inability of the law to address this threat results in an epistemic gap: algorithms are taken as a neutral tool when it is proven to the contrary. “FRT” will not be a tool unless the court and policymakers use validation standards, make transparency mandatory, and seek independent forensic audit. This is the main paradox of “FRT” in policing: it will appear to be objective but the danger of recreating the biases that the modern constitutionalism aims to eliminate

5. CONCLUSION: Towards a Justice System That Thinks Before It Automates

The potential hazard of “FRT”, in its nature, is not necessarily the low infrequency of error or mistake, but its institutional impact: it makes the criminal justice system believe that probabilistic results are deterministic ones. The question facing India, however, is not whether India can technically adopt algorithmic policing, but whether a system based on restraint, justification and human judgment can be modified to include technologies that operate on the basis of statistical abstraction without sacrificing the pledges of restraints, justification and human judgment.

The modern-day risk replicates a more ancient fallacy. Where criminology in the nineteenth century had assumed that the criminal body showed guilt, the danger of the modern systems is to assume that the data-based face shows identity. The difference matters a lot: the prejudice in the current world no longer needs ideological support to be maintained. It is able to exist in the statistical residue, numbers in sets, thresholds and error distributions. This requires a regulation

¹³ *supra* note 13.

approach that is no longer applied as a neutral forensic tool, but projected as a decision-making tool with constitutional ramifications.

Firstly, the invisibility of the facial-recognition systems restricts any serious challenge by people who are impacted. It is possible to resolve this by requiring the models' design, training data and decision logs to be disclosed so that they can be subjected to adversarial scrutiny. Secondly, lack of validation requirements allows unsafe algorithmic evidence into the criminal procedure. This can be addressed by implementing a Daubert-style framework, which makes it a requirement to show evidence of experimentation, error rates and methodological correctness. Thirdly, the assumption of impartiality, when it comes to digital evidence, clouds the aspect of probabilities of algorithmic results. It can be redressed by the necessity to make corroborations before such findings are trusted. Lastly, the deficiency of institutional responsibility in the implementation of facial recognition, through the policing system, breeds structural imbalance. It can be alleviated by imposing external supervision and compulsory audit.

The next step with criminal justice will lie in whether India will embark on automation, or on accountability.

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