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Tattoo Recognition Technology is Gaining Acceptance as a Crime-Solving Technique

SAMUEL D. HODGE, JR.¹ AND JOHN MEEHAN²

Tattoos offer a wealth of information gleaned through a simple visual examination. This visualization can help police evaluate the tattoo's location, design, colors, and any other physical characteristics to identify the person captured on video surveillance. Tattoos are also helpful in identifying a corpse where more traditional tools such as facial features or fingerprints are unsuitable. Conventional databases, such as fingerprints, facial images, DNA profiles, and dental records, are of limited use if the victim or culprit does not have a profile on record. A person's tattoos, however, are frequently recognized by many people, whether a family member, acquaintance, co-worker, or tattoo artist.

Tattoos provide helpful information, such as gang affiliation, religious beliefs, prior convictions, and years spent in jail. Digital technology now provides the police with the ability to identify individuals by taking an image of their tattoos and identifying groups of people from others who have the same body art. This method is dubbed "Tattoo Recognition Technology" ("TRT"), and it is an "emerging field in biometrics." The process works similarly to facial recognition technology. The first step is to capture a picture of the tattoo. This depiction is then processed in the computer system, where the recognition software creates a mathematical representation of the inking. This depiction is compared to the images in the database for a match.

This Article will explain the growing use of biometrics in law enforcement with a detailed examination of one of the least known techniques, tattoo recognition technology. A history of this body art form will be presented along with an explanation of the tattoo process. The science behind how tattoos can lead to a person's identification will be explored. The last section will discuss the various legal issues that arise involving tattoos, from

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“My body is my journal, and my tattoos are my story.”

- Johnny Depp

As the unruly throng of Trump supporters stormed the U.S. Capitol, a conspiracy theory emerged that the building was under siege by people “antithetical to the MAGA movement.”³ Both Fox News and various Republican legislators reported that the events were carried out by Antifa, a group of far-left individuals, who were sprinkled throughout the crowd.⁴ Within the next twenty-four hours, the narrative was repeated online 400,000 times.⁵ The Federal Bureau of Investigation (“FBI”) soon entered the fray and reported “no indication” that Antifa was involved.⁶ The false narrative was quickly debunked by close-up images of the attackers’ tattoos

3. Meg Anderson, *Antifa Didn't Storm the Capitol. Just Ask the Rioters*, NPR (Mar. 2, 2021), <https://www.npr.org/2021/03/02/972564176/antifa-didnt-storm-the-capitol-just-ask-the-rioters> [https://perma.cc/K622-6MSX].

4. *Id.*

5. *Id.*

6. *Id.*

that linked them to QAnon and other far-right organizations.⁷ This tattoo identification process was best exemplified by the bare-chested trespasser in a horned fur hat and face paint.⁸ Pictures of him in his unusual costume seemed to encapsulate the mob takeover of America's seat of power. This individual was subsequently identified as Arizona resident Jacob Chansley.⁹ His political ideology was made clear by his tattoos which expressed his neo-pagan beliefs co-opted by a growing far-right movement.¹⁰

This identification process was not the first time that law enforcement had used tattoos to catch a suspect. For instance, the police used body art to identify the person who set fire to two police cars during protests in Philadelphia following a Black Lives Movement protest on May 30, 2020.¹¹ Elisabeth Blumenthal was captured in pictures and videos as she removed a flaming piece of wood from one police vehicle and "shov[ed]" the timber into another law enforcement car that then went up in flames.¹² Even though a bandana covered her face, Blumenthal's peace symbol tattoo was captured by the photographs.¹³ Law enforcement was then able to identify her by a picture posted on LinkedIn that showed a tattoo that matched the body art of the masked individual setting fire to the police vehicles.¹⁴

This Article will explain the growing use of biometrics in law enforcement with a detailed examination of one of the least known techniques, tattoo recognition technology. A history of this body art form will be presented along with an explanation of the tattoo process. The science behind how tattoos can lead to a person's identification will be explored. The last section will discuss the various legal issues that arise involving tattoos, from employment discrimination to whether tattoo recognition software violates a person's constitutional rights.

7. Tom Birkett, *US Capitol Riot: The Myths Behind the Tattoos Worn by 'Qanon Shaman' Jake Angeli*, THE CONVERSATION (Jan. 11, 2021), <https://theconversation.com/us-capitol-riot-the-myths-behind-the-tattoos-worn-by-qanon-shaman-jake-angeli-152996> [<https://perma.cc/5rky-mgs6>].

8. *Id.*

9. *Id.*

10. *Id.*

11. Ella Torres, *Philly Woman Accused of Torching Police Cars During Protest Tracked Down Through Etsy, LinkedIn*, ABC NEWS (June 18, 2020), <https://abcnews.go.com/US/philly-woman-accused-torching-police-cars-protest-tracked/story?id=71325821> [<https://perma.cc/w2kk-nsbj>].

12. Dep't of Just., *U.S. Attorney McSwain Announces Charges Against Philadelphia Woman for Arson of Two Philadelphia Police Cars During Protests* (June 17, 2020), <https://www.justice.gov/usao-edpa/pr/us-attorney-mcswain-announces-charges-against-philadelphia-woman-arson-two-philadelphia> [<https://perma.cc/htg6-ylfb>].

13. Torres, *supra* note 11.

14. *Id.*

I. INTRODUCTION

Tattoos offer a wealth of information gleaned through a simple visual examination.¹⁵ This visualization can help police evaluate the tattoo's location, design, colors, and any other physical characteristics to identify the person captured on video surveillance. Tattoos are also helpful in identifying a corpse where more traditional tools such as facial features or fingerprints are unsuitable.¹⁶ Criminals are known to cut off hands, feet, or heads to hinder traditional identification methods. They may also bury, dump, or otherwise attempt to mutilate the body.¹⁷ Conventional databases, such as fingerprints, facial images, DNA profiles, and dental records, are of limited use if the victim or culprit does not have a profile on record. A person's tattoos, however, are frequently recognized by many people, whether a family member, acquaintance, co-worker, or tattoo artist.¹⁸

An inking may also become an integral part of eyewitness identification,¹⁹ and the tattoo's composition offers valuable investigative clues. For instance, a tattoo's chemical makeup can help ascertain the ink's age, quality, or prevalence.²⁰

II. HISTORY OF TATTOOS

A tattoo is a mark, figure, design, or word fixed or positioned on the skin.²¹ The oldest inking was accidentally discovered on a body frozen in ice in 1991. The mummy, dubbed Ötzi, named after the valley where he was found, is believed to be 5,300 years old.²² The decedent had over fifty lines and crosses tattooed on his corpse, most of them located on his spine, knee, and ankle joints.²³ These markings surprised scientists because many

15. *Inkspector: The Forensic Analysis of Tattoos and Ink*, 4TH WALL (May 12, 2017), <https://www.the4thwall.net/blog/2017/2/8/inkspector> [https://perma.cc/T5GQ-UK3P].

16. *Id.*

17. *Id.*

18. *Id.*

19. *Id.*

20. *Inkspector*, *supra* note 15.

21. *Tattoo*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/tattoo> [https://perma.cc/D4R2-2PWQ].

22. *What is the History of Tattoos?*, MCGILL UNIV. (Mar. 20, 2017), <https://www.mcgill.ca/oss/article/history-you-asked/what-history-tattoos#:~:text=have%20us%20believe-.Ethnographic%20and%20historical%20texts%20reveal%20that%20tattooing%20has%20been%20practiced,criminals%20and%20slaves%20with%20tattoos> [https://perma.cc/NP72-3XFS].

23. *Id.*

of them are linked to traditional Chinese acupuncture points, particularly those used to remedy back pain and stomach issues.²⁴

Before Ötzi thrust his head through the ice, the earliest tattoos were traced to the Egyptian mummies discovered in the Great Pyramids from more than four thousand years ago.²⁵ Evidence, however, suggests that the art of tattooing is much older and more widespread than the mummies would suggest. Ancient texts demonstrate that body art has been an accepted part of cultures throughout ancient times.²⁶ Greeks and Romans around the eighth to sixth centuries BC believed that body art was associated with being a barbarian or an outcast from society.²⁷ The Greeks learned the craft from the Persians and used tattoos to identify slaves and criminals if they escaped.²⁸ Soldiers and arms manufacturers liked to be tattooed, and this practice continued into the ninth century. Slaves were also tattooed in ancient Rome to show they had paid their taxes.²⁹

With the Age of Discovery and the emergence of worldwide trade routes, the negative association with tattoos began to fade. Explorers like Sir Martin Frobisher, William Dampier, and Captain James Cook often returned home with indigenous people from places they explored, and these natives were often tattooed.³⁰ This art form started to gain favor among sailors and members of the “lower classes.” Eventually, they become more socially acceptable. As the art movement developed again in Europe, tattooing became a pastime of the aristocracy who had the financial ability to hire professionals to provide these body inkings.³¹

This fascination among the rich did not last. Tattoos were once again seen as reserved for people of the lower classes. They would retain this stigma until the 1960s when it again became an acceptable practice.³² Tat-

24. *Id.*

25. *Id.*

26. *Id.*

27. Amy Olson, *A Brief History of Tattoos*, WELLCOME COLLECTION (Apr. 13, 2010), https://wellcomecollection.org/articles/W9m2QxcAAF8AFvE5?utm_source=Google&utm_medium=adgrant&utm_campaign=Stories_Apr20&gclid=CjwKCAiAhbeCBhBcEiwAkV2cY9jdxLaV0mZiC10LoySjcY3BtHQb5pLmJUioAVQDyIQ4rrRdgHco5BoCOdMQAvD_BwE [https://perma.cc/DF5K-EKC2].

28. *Id.*

29. *History and Origins of Tattoos*, MARKED BY INKED (Jan. 6, 2020), <https://markedbyinked.com/blogs/news/history-origin-of-tattoos> [https://perma.cc/P252-NEZK].

30. Christopher McFadden, *The Very Long and Fascinating History of Tattoos*, INTERESTING ENG'G (Apr. 5, 2019), <https://interestingengineering.com/the-very-long-and-fascinating-history-of-tattoos> [https://perma.cc/73ZQ-UBZ7].

31. *Id.*

32. *Id.*

tooning is now a booming business, with one out of every seven individuals in the United States having an inking.³³ This social acceptance has helped the tattooing industry grow exponentially. From the artists behind today's tattoos to the ink and tools that make their artwork imaginable, the sky is the limit for those who desire to have their bodies turned into a canvas.³⁴ This twenty-first century acceptance is linked to tattoos being openly displayed by celebrities, athletes, people within the fashion industry, and the awareness-building done by tattoo artists.³⁵ Today, tattoos are commonly found on both sexes, people of all economic statuses, and varying ages.³⁶

A. WHY DO PEOPLE GET TATTOOS?

Growth in reality television, social media, and sanitation advances have helped tattoos become more “mainstream.”³⁷ As the stigma against tattoos has declined, it bears asking why people get tattoos in the first place. One source noted that “[w]hen you ask tattooed people about why they decided to [get a tattoo], you’ll discover that there is no one reason for doing it.”³⁸ However, this same source noted several common themes related to why people elected to tattoo their bodies. These motives include (i) cultural reasons, (ii) personal purposes, (iii) attraction to the aesthetics of a tattoo, (iv) a means of expressing individuality, (v) to be rebellious, (vi) cosmetic reasons, and (vii) addiction to the pain or process of tattooing.³⁹

Body art has been around for centuries,⁴⁰ and different cultures have established rituals centered on these markings.⁴¹ Some believed tattoos represented rites of passage or signs of status and rank.⁴² While these cultural tattoos have likely changed from their more traditional imagery and mean-

33. *What is the History of Tattoos?*, *supra* note 22.

34. Jodie Michalak, *Why Has the Popularity of Tattoos Grown?*, BYRDIE (May 26, 2021), <https://www.byrdie.com/why-are-tattoos-popular-3189518> [<https://perma.cc/3PDU-H4BP>].

35. *Id.*

36. *History of Tattoos – Meaning and Origin*, HIST. OF TATTOOS, <http://www.historyoftattoos.net/#:~:text=So%20tattoos%20were%20known%20around,society%20but%20also%20a%20punishment> [<https://perma.cc/K6VU-CB3P>].

37. *How Tattoos Have Changed Decade to Decade*, INKBOX (Sept. 15, 2017), <https://inkbox.com/blog/post/how-tattoos-have-changed-decade-to-decade> [<https://perma.cc/QNC9-UDRL>].

38. Dan Hunter, *Why Do People Get Tattoos?*, AUTH. TATTOO (Nov. 28, 2020), <https://authoritytattoo.com/why-do-people-get-tattoos/> [<https://perma.cc/Z8S4-KS65>].

39. *Id.*

40. *What is the History of Tattoos?*, *supra* note 22.

41. Hunter, *supra* note 38.

42. *Tattoo Culture*, VANISHING TATTOO, http://www.vanishingtattoo.com/tattoos_culture.htm [<https://perma.cc/CNP9-HYQR>].

ing, many people continue to wear tattoos as symbols of their past and present ethos.⁴³

Others select tattoos for personal reasons.⁴⁴ They often signify something significant in the recipient's life, whether it be the birth of a child, the death of a loved one, song lyrics, or a slogan that the person finds meaningful.⁴⁵ Similarly, some tattoo their bodies to display their individuality or just because they like the aesthetics of a tattoo on their skin.⁴⁶ Others find tattoos beautiful and perceive them as a piece of art. They select inkings based upon what they believe looks best against their skin, like how people apply makeup and select clothing.⁴⁷ A tattoo also provides an avenue for rebellion as tattoos help them "defy cultural norms, family expectations, or push the envelope in professional settings."⁴⁸ A number of people are addicted to the pain associated with being inked.⁴⁹ One person equated this euphoric feeling of being tattooed with that of a "runner's high."⁵⁰

There is even a medical justification for obtaining a tattoo. It can hide imperfections on the skin.⁵¹ The body art can cover scars, stretch marks, or cellulite.⁵² For example, some women elect to obtain "mastectomy tattoos" after breast cancer surgery.⁵³ These tattoos can (i) allow women to feel more confident after their breast cancer surgery, (ii) create a personal sentiment, and (iii) cover scars from the surgery.⁵⁴

These reasons for why people acquire body art are not exhaustive, but they provide insight into some of the more common explanations for obtaining a tattoo in the twenty-first century. Regardless of the justification, the process by which a person is tattooed is pretty consistent.

43. Hunter, *supra* note 38.

44. *Id.*

45. *Id.*

46. *Id.*

47. Emilia Brooks, *Why Do People Get Tattoos?* | *Review with Reasons*, EMOZZY.COM, <https://emozzy.com/why-do-people-get-tattoos/> [https://perma.cc/5EMB-585H].

48. Hunter, *supra* note 38.

49. *Id.*

50. *Id.*

51. *Id.*

52. *Id.*

53. *Decorative Tattoos After Breast Cancer Surgery*, BREAST CANCER NOW, <https://breastcancernow.org/information-support/facing-breast-cancer/living-beyond-breast-cancer/your-body/decorative-tattoos-after-breast-cancer-surgery> [https://perma.cc/4K6U-3NLU].

54. *Id.*

B. THE TATTOOING PROCESS

In 1890, Samuel O'Reilly, a New York tattoo artist, invented and patented the first electric tattooing machine.⁵⁵ Modern-day equipment is “relatively unchanged” from the machine invented by Mr. O'Reilly.⁵⁶ Today's tattooing process uses the following items: (i) a sterilized needle, (ii) a tube system, (iii) an electric motor, and (iv) a foot pedal.⁵⁷

Tattoo machines are used to inject ink into the recipient's skin based upon a previously drawn sketch.⁵⁸ This hand-held device operates very much like a sewing machine, with one or more of the needles entering the skin repeatedly.⁵⁹ The equipment punctures the recipient's outer layer of skin with a needle fifty to three thousand times per minute.⁶⁰ With each puncture, the tiny needle will deposit insoluble ink droplets into the second layer of skin: the dermis.⁶¹

The body sends immune system cells to each puncture site in response to the needle puncture.⁶² Macrophage cells arrive at those sites and attack the dye deposited by the needle in an attempt to “clean up” the inflammation caused by the piercing.⁶³ However, some of the deposited particles are “too big to be eaten by the [macrophage].”⁶⁴ Dye that is not destroyed by the macrophage is then “soaked up” by skin cells called fibroblasts.⁶⁵ Both the fibroblasts cells and many of the macrophage cells that remain are embedded in the dermis permanently.⁶⁶

55. Steve Gilbert, *Tattoo History Source Book: England*, WAYBACK MACH., <https://web.archive.org/web/20081120134212/http://www.tattoos.com/jane/england.htm> [https://perma.cc/XPF5-NTM3].

56. Tracy V. Wilson, *How Tattoos Work*, HOWSTUFFWORKS (Feb. 12, 2021), <https://health.howstuffworks.com/skin-care/beauty/skin-and-lifestyle/tattoo.htm> [https://perma.cc/U4RX-EDCP].

57. *Id.*

58. *Id.*

59. *Tattoos: Understand Risks and Precautions*, MAYO CLINIC (Feb. 28, 2020), <https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/tattoos-and-piercings/art-20045067> [https://perma.cc/26LG-YXE5].

60. Wilson, *supra* note 56; *How Does Tattooing Work?* PREMIUM TATTOO REMOVAL, <https://www.premiumtattooremoval.com/how-does-tattooing-work> [https://perma.cc/9PKP-CYJD].

61. Wilson, *supra* note 56; *How Does Tattooing Work?*, *supra* note 60.

62. *How Does Tattooing Work?*, *supra* note 60.

63. *Id.*

64. Carley Lintz, *FYI: What Makes Tattoos Permanent*, POPULAR SCI. (June 13, 2013), <https://www.popsoci.com/science/article/2013-06/fyi-what-makes-tattoos-permanent/> [https://perma.cc/4G8W-WVV3].

65. *How Does Tattooing Work?*, *supra* note 60.

66. *Id.*

C. HEALTH RISKS ASSOCIATED WITH TATTOOING

Despite the popularity of tattoos, many health risks associated with the process persist. The skin is a protective barrier to the outside environment, and any breach of the skin can place the person at risk for an infection or allergic reaction.⁶⁷ Some of these potential problems include allergic reactions, skin infections, inflammation, keloids, blood borne diseases, and interference with magnetic resonance imaging (MRI) testing.⁶⁸

For instance, a recipient can develop an allergic reaction to the dye used in the tattooing process.⁶⁹ These reactions generally occur at the puncture site and can involve itching, burning, swelling, or redness.⁷⁰ Any ink may trigger an allergic reaction but henna and mercury-containing, red tattoo pigments are a frequent cause.⁷¹ The American Academy of Dermatology reports that an allergic reaction can happen immediately, weeks later, and even years afterward.⁷² For instance, joint replacement surgery or the start of treatment for HIV can activate a subsequent reaction.⁷³

More serious skin infections involve symptoms similar to an allergic reaction, but the areas infected can spread to parts of the body other than the tattoo site.⁷⁴ Skin infections can include both staph contaminations and cutaneous tuberculosis.⁷⁵ When the infection spreads to a surrounding area, it is known as cellulitis. It can even seep into the bloodstream, causing sepsis.⁷⁶ Individuals with a compromised immune system, diabetes, heart disease, or poor circulation are particularly at risk.⁷⁷

Studies differ as to whether being tattooed increases the recipient's risk of developing hepatitis C. The consensus seems to be that the environment where one is tattooed and the safety precautions that a tattoo artist

67. *Think Before You Ink: Health Risks Associated with Tattoos*, DRUGS.COM (Apr. 4, 2020), <https://www.drugs.com/slideshow/tattoo-health-risks-1233> [<https://perma.cc/S5Y2-S938>].

68. *Tattoos: Understand Risks and Precautions*, *supra* note 59; Valencia Higuera, *Getting Tattooed or Pierced*, HEALTHLINE (Aug. 31, 2020), <https://www.healthline.com/health/beauty-skin-care-tattoos-piercings> [<https://perma.cc/5A5K-TMV9>].

69. *Id.*

70. Tim Jewell, *How to Identify and Treat a Tattoo Allergy*, HEALTHLINE (Jan. 7, 2021), <https://www.healthline.com/health/tattoo-allergy> [<https://perma.cc/9BEF-5865>].

71. *Think Before You Ink: Health Risks Associated with Tattoos*, *supra* note 67.

72. Sandee LaMotte, *Red Is the Most Risky Ink Color, and Other Health Issues from Tattoos*, CNN (Oct. 29, 2019), <https://www.cnn.com/2019/10/28/health/tattoo-healing-risks-and-tips-wellness/index.html> [<https://perma.cc/35EW-HNX5>].

73. *Id.*

74. Jewell, *supra* note 70.

75. Higuera, *supra* note 68.

76. *Think Before You Ink: Health Risks Associated with Tattoos*, *supra* note 67.

77. *Id.*

takes play a paramount role in keeping the person safe.⁷⁸ The chances of contracting a blood-borne disease from a tattoo can be diminished if the artist (i) uses clean needles, (ii) is licensed, (iii) washes his or her hands, (iv) sterilizes the equipment, and (v) cleans the work area from any germs.⁷⁹ Aside from hepatitis C, the recipient of a tattoo is at risk for contracting other blood-borne diseases such as methicillin-resistant *Staphylococcus aureus* (MRSA), hepatitis B, HIV, or tetanus.⁸⁰ These infection risks caused the American Association of Blood Banks to mandate a one-year delay between receiving a tattoo and blood donation.⁸¹

A person should also not underestimate the discomfort associated with the process or how much the site will bleed.⁸² The tattoo causes pain both during the application and healing process. Certain areas of the body, such as the hands, neck, face, back of the knees, and genital region, contain a concentration of nerve endings.⁸³ These locations will experience more discomfort than the shoulder or hips. They also have a much richer blood supply, so there will be more bleeding during the inking.⁸⁴

A little-appreciated complication involving tattoos is their interference with magnetic resonance imaging.⁸⁵ Some of the inks used in tattooing contain trace amounts of metal that can generate an electrical current during the MRI.⁸⁶ This process can elevate the skin's temperature enough to burn it.⁸⁷

III. THE USE OF BIOMETRICS BY LAW ENFORCEMENT

Digital technology has transformed most aspects of daily life. Law enforcement agencies and identity management organizations are no different. They are increasingly employing automated biometric technologies to help

78. Charles Daniel, *The Risk of Viral Hepatitis from Tattoos*, VERY WELL HEALTH (May 19, 2020), <https://www.verywellhealth.com/color-me-yellow-1759985> [<https://perma.cc/T99Y-R9K2>].

79. *Id.*

80. *Tattoos: Understand Risks and Precautions*, *supra* note 67; Higuera, *supra* note 68.

81. Iliana A. Rahimi, Igor Eberhard, & Erich Kasten, *Tattoos-What Do People Really Know About the Medical Risks of Body Ink?*, 11 J. CLINICAL & AESTHETIC DERMATOLOGY 3, 30-35 (2018), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5868782/> [<https://perma.cc/Y697-MEAH>].

82. *Think Before You Ink: Health Risks Associated with Tattoos*, *supra* note 67.

83. *Id.*

84. *Id.*

85. *Id.*

86. *Id.*

87. *Think Before You Ink: Health Risks Associated with Tattoos*, *supra* note 67.

identify or verify personal identities and solve crimes.⁸⁸ From border security, criminal investigations, and background checks, all aspects of law enforcement rely upon exchanging biometric data such as fingerprints, facial recognition technology, and automated license plate readers.⁸⁹

A. BIOMETRICS

The FBI defines biometrics as “the measurable biological (anatomical and physiological) or behavioral characteristics used for identification of an individual.”⁹⁰ The term is derived from the Greek “bio” and “metric,” which mean “life” and “measure,” respectively.⁹¹ The power of biometrics rests on the fact that biometric identifiers are unique from person to person.⁹² Their distinctiveness is what makes biometric identifiers a dependable source for identification.⁹³

Biometric identification is a technique by which a statistical analysis is applied to an individual’s biological characteristics for identification purposes.⁹⁴ The types of measurements used are referred to as biometric modalities.⁹⁵ In turn, they are classified as either physiological or behavioral.⁹⁶ While fingerprints are perhaps the most commonly recognized physiological biometric modality, other forms have gained prevalence over the years.⁹⁷ These identification markers include the iris, face, and ridges on one’s fingers, voice recognition, and DNA.⁹⁸ Behavioral biometric identifiers include a person’s signature, gait, and keystrokes when typing.⁹⁹

88. *Biometric Standards for Law Enforcement*, NIST, <https://www.nist.gov/industry-impacts/biometric-standards-law-enforcement> [https://perma.cc/BK6S-AGAN].

89. *Id.*

90. *Fingerprints and Other Biometrics*, FBI, <https://www.fbi.gov/services/cjis/fingerprints-and-other-biometrics> [https://perma.cc/TJ2V-33XK].

91. Alexander S. Gillis, *Biometrics*, TECHTARGET, <https://searchsecurity.techtarget.com/definition/biometrics> [https://perma.cc/RSR9-BUK8].

92. Rawlson King, *What Are Biometrics?*, BIOMETRIC UPDATE.COM, <https://www.biometricupdate.com/201601/what-are-biometrics-2> [https://perma.cc/S8JS-A2E2].

93. *See Biometric Identification Technology – A Primer*, BLINK IDENTITY, <https://blinkidentity.com/what-is-biometric-identification/> [https://perma.cc/AEK7-KML9].

94. *Id.*

95. *Id.*

96. *Id.*

97. *Id.*

98. *Fingerprints and Other Biometrics*, *supra* note 90.

99. *Id.*

B. USE OF BIOMETRICS BY LAW ENFORCEMENT

Criminal identification techniques first emerged in the late nineteenth century. They were generated by the creation of the Henry System of fingerprint classification.¹⁰⁰ This technique classifies fingerprints by physiological characteristics and anthropometrics, in which dimensions are acquired from suspects and filed of record.¹⁰¹ England started employing biometrics for identification in 1901. Its first application in the United States was performed by the New York police one year later.¹⁰² Within twenty years, the FBI had established its first identification department, creating a central storehouse of criminal identification data for law enforcement agencies.¹⁰³

Today, law enforcement uses biometrics for multiple purposes.¹⁰⁴ First, the police use the technology to identify known suspects or criminals.¹⁰⁵ Biometric traces left behind at crime scenes are used to identify individuals involved with a crime,¹⁰⁶ and to identify victims of an offense.¹⁰⁷ Biometrics can even help law enforcement with surveillance and security tasks.¹⁰⁸

100. *Automated Fingerprint Identification System (AFIS) Overview – A Short History*, THALES (June 18, 2021), <https://www.thalesgroup.com/en/markets/digital-identity-and-security/government/biometrics/afis-history> [<https://perma.cc/2QHP-7HVQ>].

101. *Id.*

102. *Id.*

103. *Id.*

104. Mehedi Hassan, *How Law Enforcement Agencies are Using Biometrics?*, M2SYS BLOG

(Mar. 7, 2017), <https://www.m2sys.com/blog/biometric-hardware/law-enforcement-agencies-biometrics/> [<https://perma.cc/2LMV-6QSV>]. In 1892, an Argentinian mother came home to find her six and four-year-old children stabbed to death. Initially, the police identified a man named Velasquez as a suspect for the murders. The police arrested and tortured Velasquez for multiple weeks, all the while Velasquez continued to maintain his innocence. The police later discovered a bloody fingerprint on the bedroom door when they returned to the crime scene for further examination. The police were then able to match the bloody fingerprint to the fingerprint of the murdered children's mother. Shortly thereafter, the mother confessed to killing her children. *A Bloody Fingerprint Elicits a Mother's Evil Tale in Argentina*, HIST., <https://www.history.com/this-day-in-history/a-bloody-fingerprint-elicits-a-mothers-evil-tale-in-argentina> [<https://perma.cc/V454-HUWS>].

105. *A Bloody Fingerprint Elicits a Mother's Evil Tale in Argentina*, *supra* note 104.

106. Danny Thakkar, *Biometric Identification for Law Enforcement Agencies: From Local Crimes to National Security*, BAYOMETRIC, <https://www.bayometric.com/biometric-identification-law-enforcement-agencies/> [<https://perma.cc/ET9N-6UXP>].

107. Bryan T. Johnson & John Riemen, *Digital Capture of Fingerprints In A Disaster Victim Identification Setting: A Review And Case Study*, 4 FORENSIC SCI. RSCH. 299-302 (2019).

108. Hassan, *supra* note 104.

Biometric technologies are used for two primary purposes: (i) to identify an individual, and (ii) verify that a person is who they claim to be.¹⁰⁹ When the technology is used to identify an individual, the method will be utilized to conduct a one-to-many comparison. Conversely, when used to verify the identity of an individual, the technology will use a one-to-one comparison of two separate images.¹¹⁰ Accordingly, one-to-many matching is referred to as “identification,” while one-to-one matching is dubbed “verification.”¹¹¹ In one-to-one verification, a biometric matching system will help to ascertain whether the subject is the person who they say they are.¹¹² The biometric system will compare the individual’s biometric trait(s) against a profile that already exists in a database to see if there is a match.¹¹³ In a one-to-many identification, a system will aim to recognize an unknown person.¹¹⁴ This type of use will compare a generated biometric characteristic against all of the biometric traits stored in a database in hopes of finding a match.¹¹⁵

These comparison tools will use a “live” image of a person’s body and compare it to an already stored image.¹¹⁶ In addition to the development and use of traditional biometric technologies, such as fingerprinting and facial recognition, researchers and law enforcement officials have begun to look at “soft” biometric traits to identify individuals.¹¹⁷ Tattoos are among these “soft” biometric traits.¹¹⁸

IV. TATTOO RECOGNITION TECHNOLOGY

Tattoos are a valuable method for person identification in forensics.¹¹⁹ They frequently provide helpful information, such as gang affiliation, reli-

109. Fabio Bacchini & Ludovica Lorusso, *A Tattoo is Not a Face. Ethical Aspects of Tattoo-Based Biometrics*, 16 J. INFO. COMM’N AND ETHICS IN SOC’Y 110 (2017).

110. *Id.*

111. John Trader, *The Difference Between 1:N, 1:1, and 1:Few and Why it Matters in Patient ID*, RIGHT PATIENT (Sept. 23, 2015), <https://www.rightpatient.com/blog/the-difference-between-1n-11-and-1few-and-why-it-matters-in-patient-id/> [<https://perma.cc/CV87-LRKV>].

112. Stephen Mayhew, *Explainer: Verification vs. Identification Systems*, BIOMETRIC UPDATE.COM, <https://www.biometricupdate.com/201206/explainer-verification-vs-identification-systems> [<https://perma.cc/GLX9-9A3Q>].

113. *Id.*

114. *Id.*

115. *Id.*

116. *Id.*

117. Bacchini & Lorusso, *supra* note 109.

118. *Id.*

119. ANIL K. JAIN, JUNG-EUN LEE, & RONG JIN, TATTOO-ID: AUTOMATIC TATTOO IMAGE RETRIEVAL FOR SUSPECT AND VICTIM IDENTIFICATION 256-65 (Horace H.-S. Ip et al. eds., 2007).

gious beliefs, prior convictions, and years spent in jail.¹²⁰ Digital technology now provides the police with the ability to identify individuals by taking an image of their tattoos and identifying groups of people from others who have the same body art.¹²¹ This method is dubbed “Tattoo Recognition Technology” (“TRT”), and it is an “emerging field in biometrics.”¹²² The Electronic Frontier Foundation (“EFF”) has described the technique as a method that “uses images of people’s tattoos to identify them, reveal information about them[,] such as their . . . political beliefs, and associate them with people with similar tattoos.”¹²³

A. FACIAL RECOGNITION TECHNOLOGY ANALOGY

TRT works similarly to facial recognition technology.¹²⁴ Because of this resemblance, it is instructive to first examine the more developed facial recognition technology functions. The securing of an image of a person’s face is the first step in the process.¹²⁵ This is accomplished by a camera that captures the image of faces as they pass by.¹²⁶ The next step is the facial recognition component.¹²⁷ This stage involves an examination of the captured image by the facial recognition software.¹²⁸ The operational system analyzes the geometry of the face captured by the camera.¹²⁹ The information is then converted into digital information according to the person’s facial features.¹³⁰ A unique face print is created during this step as the individual’s face is “essentially turned into a mathematical formula.”¹³¹ Finally, the print created from the captured image will be compared in a database that stores other known face prints to find a match.¹³²

120. *Id.*

121. David Reutter, *Tattoo Recognition: Law Enforcement’s Newest Identification Tool*, PRISON LEGAL NEWS (Oct. 9, 2017), <https://www.prisonlegalnews.org/news/2017/oct/9/tattoo-recognition-law-enforcements-newest-identification-tool/> [https://perma.cc/64BK-2YQA].

122. Bacchini & Lorusso, *supra* note 109.

123. *Tattoo Recognition*, ELEC. FRONTIER FOUND., <https://www.eff.org/pages/tattoo-recognition> [https://perma.cc/47GJ-D8W4].

124. *See id.*

125. *What Is Facial Recognition – Definition and Explanation*, KASPERSKY, <https://www.kaspersky.com/resource-center/definitions/what-is-facial-recognition> [https://perma.cc/BX43-6DFD].

126. *Id.*

127. *Id.*

128. *Id.*

129. *Id.*

130. *What Is Facial Recognition – Definition and Explanation*, *supra* note 125.

131. *Id.*

132. *Id.*

TRT operates similarly.¹³³ The first step is to capture a picture of the tattoo.¹³⁴ This depiction is then processed in the computer system, where the recognition software creates a mathematical representation of the inking.¹³⁵ This depiction is compared to the images in the database for a match.¹³⁶

B. NATIONAL INSTITUTE ON STANDARDS AND TECHNOLOGY

The National Institute on Standards and Technology (NIST) has created a “Best Practices” list for taking pictures of tattoos for use with TRT.¹³⁷ These recommendations require taking two tattoo images: one focusing on the body art itself and another that displays where tattoos are situated on the body.¹³⁸ NIST urges law enforcement to capture the entire image for large tattoos, followed by images of specific interest points in the inking.¹³⁹ When a person is incarcerated, pictures of tattoos may be taken of the entire body, encompassing parts that would not be ordinarily observable, such as upper legs, chests, and genital areas.¹⁴⁰

These tattoos are frequently marked with metadata, such as the body position and ink color.¹⁴¹ This recommended tagging system is known as ANSI/NIST-ITL Standard (Standard).¹⁴² This setup has dozens of codes to classify the tattoo imagery, varying from general groupings like political symbols and sports icons to focused pictures, such as a cross or the American flag.¹⁴³ The Standard assigns categorical keyword labels to tattoos.¹⁴⁴

133. *Tattoo Recognition*, *supra* note 123.

134. *Id.*

135. *Id.*

136. *Id.*

137. *Id.* NIST is a non-regulatory federal agency within the United States Department of Commerce. *NIST General Information*, NIST, <https://www.nist.gov/director/pao/nist-general-information> [https://perma.cc/TG32-WK2F] (last updated Feb. 1, 2021). The mission of NIST is “to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.” *Id.*

138. *Tattoo Recognition*, *supra* note 123.

139. *Id.*

140. *Id.*

141. *Id.*

142. There are four variations of this tattoo identification software. The first version was issued in 1993 and the second version was released in 1997. The next version was issued in 2000 by combining the years 1993 and 1997 into what became known as ANSI/NIST ITL 1-2000. This edition contains fingerprint, facial scars, marks, and tattoos. Eventually, a 2011 version was issued. CHRISTINA SMITH, 21ST CENTURY IDENTIFICATION AND INFORMATION SHARING THESIS (2015), <https://vc.bridgew.edu/theses/9/> [https://perma.cc/HN8G-5KH9].

143. *Id.*

They start out by defining eight major classes: (i) human, (ii) animal, (iii) plant, (iv) flag, (v) object, (vi) abstract, (vii) symbol, and (viii) other.¹⁴⁵ The protocol then provides seventy subclasses for categorizing these tattoos.¹⁴⁶

This approach has a variety of drawbacks.¹⁴⁷ They include “the limited number of class labels to describe the wide variety of new tattoo designs, the need for multiple keywords to sufficiently describe some tattoos, and subjectivity in the human annotation as the same tattoo can be labeled differently by officers.”¹⁴⁸ These limitations have prompted researchers and investigators to improve the process for identifying and matching tattoos.¹⁴⁹ Advances in learning technology and the establishment of organized tattoo datasets have led to more automated and streamlined procedures than the traditional keyword labeling approach.¹⁵⁰

C. DATABASES

With the FBI and the Department of Homeland Security’s support, in 2014, NIST began a multi-part process that sought to enhance machine learning algorithms to identify better and match people based on their tattoos.¹⁵¹ The system initiated by NIST is known as the Tattoo Recognition Technology Program.¹⁵² The activities under this program are: (i) Tatt-C, (ii) Tattoo Recognition Technology—Best Practices (“Tatt-BP”), and (iii) Tattoo Recognition Technology—Evaluation (“Tatt-E”).¹⁵³

Tattoo-ID is one of the first known systems used for tattoo-image identification, matching, and retrieval.¹⁵⁴ Researchers began experimenting with this system in 2015.¹⁵⁵ This database offers the ability to distinguish features of a tattoo query image (i.e., color, shape, texture) and, a “near-

144. MEI NGAN ET AL., *TATTOO RECOGNITION TECHNOLOGY – EVALUATION (TATT-E) PERFORMANCE OF TATTOO IDENTIFICATION ALGORITHMS* (U.S. Dep’t of Com., 2018), <https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.8232.pdf> [<https://perma.cc/D7ST-HZBY>].

145. JUNG-EUN LEE ET AL., *IMAGE RETRIEVAL IN FORENSICS: TATTOO IMAGE DATABASE APPLICATION 4* (IEEE Computer Society, 2012), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.389.9399&rep=rep1&type=pdf> [<https://perma.cc/V93S-HM4U>].

146. *Id.*

147. NGAN ET AL., *supra* note 144, at 1.

148. *Id.* at 1.

149. *Id.*

150. *Id.*

151. *NIST Tattoo Recognition Technology Program FOIA*, ELEC. FRONTIER FOUND., <https://www.eff.org/cases/nist-tattoo-recognition-technology-program-foia> [<https://perma.cc/DUM8-BNMZ>].

152. NGAN ET AL., *supra* note 144, at 1.

153. *Id.*

154. *Id.*

155. *Id.*

duplicate” tattoo image is retrieved from a database if it exists.¹⁵⁶ A database of nearly 100,000 images of tattoos has been assembled,¹⁵⁷ and it has “a top-20 retrieval accuracy of 90.5 percent.”¹⁵⁸ The Tattoo-ID system was eventually licensed to MorphoTrak.¹⁵⁹ This company offers biometric and identity management solutions to law enforcement, border control, driver licenses, civil identification, and facility/IT security.¹⁶⁰ This software was subsequently used in the National Institute of Standards and Technology’s Tattoo Recognition Technology—Challenge (“Tatt-C”).¹⁶¹

Tatt-C was created in 2015.¹⁶² It is described on the NIST website as a “challenge to the commercial and academic community in advancing research and development into automated image-based tattoo matching technology.”¹⁶³ In total, nineteen research institutions, universities, and private companies signed up to participate in the endeavor.¹⁶⁴ Those lending a hand received a dataset of fifteen thousand images of tattoos to test the recognition software.¹⁶⁵ “[S]till images of tattoos captured . . . by law enforcement agencies” were provided to participants “to provide a basis for developing TRT system for different use cases.”¹⁶⁶ Participants in Tatt-C ran their tattoo identification algorithms on the provided dataset.¹⁶⁷ The participants then provided their outputs to NIST for scoring.¹⁶⁸ This scoring was based upon five use criteria: (i) identification, (ii) a region of interest, (iii) mixed media, (iv) similarity, and (v) detection.¹⁶⁹ The MorphoTrak system was the top-performing algorithm for identification, region of interest, and detection.¹⁷⁰

156. LEE ET AL., *supra* note 145, at 4.

157. *Id.* at 2.

158. *Id.*

159. *Id.* at 4.

160. *MorphoTrak*, SECURITYINFOWATCH.COM, <https://www.securityinfowatch.com/home/company/10983642/morpho-trak> [https://perma.cc/EL8V-4K4P].

161. MEI NGAN ET AL., TATTOO RECOGNITION TECHNOLOGY – CHALLENGE (TATT-C) OUTCOMES AND RECOMMENDATIONS REVISIONS 1.0 (U.S. Dep’t of Com., 2016).

162. Bacchini & Lorusso, *supra* note 109.

163. *Tattoo Recognition Technology – Challenge (Tatt-C)*, NIST (Nov. 2, 2016), <https://www.nist.gov/programs-projects/tattoo-recognition-technology-challenge-tatt-c> [https://perma.cc/6W6L-KJAB].

164. Elec. Frontier Found. v. Dep’t of Com., at ¶ 17, (No. 1:17-cv-02567).

165. Lisa Vaas, *NIST Shared Dataset of Tattoos That’s Been Used to Identify Prisoners*, NAKED SEC. (Mar. 19, 2020), <https://nakedsecurity.sophos.com/2020/03/19/nist-shared-dataset-of-tattoos-thats-been-used-to-identify-prisoners/> [https://perma.cc/DQC6-5BGQ].

166. Bacchini & Lorusso, *supra* note 109.

167. NGAN ET AL., *supra* note 161.

168. *Id.*

169. *Id.*

170. *Id.*

Tatt-E was launched in 2016, and it is considered to be the “follow-on” to Tatt-C.¹⁷¹ NIST described the purpose of Tatt-E as “assess[ing] and measur[ing] the capability of systems to perform automated image-based tattoo recognition.”¹⁷² In total, twelve tattoo recognition algorithms were evaluated as part of this new system.¹⁷³ The algorithms tested images collected from incarcerated individuals provided by the Michigan State Police and the Pinellas County Sheriff’s Office in Florida.¹⁷⁴ The MorphoTrak algorithm matched separate tattoo images to the correct match 67.9 percent of the time.¹⁷⁵

In 2016, NIST issued the *Tattoo-Recognition Technology – Best Practices (Tatt-BP) Guidelines for Tattoo Image Collection*.¹⁷⁶ Tatt-BP and its supplemental materials “provide[d] best practice guideline material . . . for the proper tattoo images to support image-based tattoo recognition.”¹⁷⁷ As of 2017, Tatt-BP was considered to be in its infancy stage of development and use.¹⁷⁸ Multiple universities continue to develop TRT for law enforcement agencies and private companies. Indemia, for example, is a private vendor for biometric identification technology that is working on TRT in conjunction with the University of Michigan.¹⁷⁹

D. USE OF TATTOOS BY LAW ENFORCEMENT

The police use tattoos to identify suspects, and prison officials employ body markings to recognize gang members.¹⁸⁰ While more than forty-five million Americans have tattoos, these inkings can provide vital information in the criminal justice system. For instance, if a suspect refuses to provide

171. Elec. Frontier Found. v. Dep’t of Com., 1:17-cv-02567 (D.D.C. 2017), Complaint at ¶ 19; NGAN ET AL., *supra* note 161.

172. *Tattoo Recognition Technology-Evaluation (Tatt-E)*, NIST (Apr. 30, 2019), <https://www.nist.gov/programs-projects/tattoo-recognition-technology-evaluation-tatt-e> [<https://perma.cc/Q88V-HUAN>].

173. NGAN ET AL., *supra* note 144.

174. Dave Maass, *Federal Researchers Complete Second Round of Problematic Tattoo Recognition Experiments*, ELEC. FRONTIER FOUND. (Nov. 13, 2018), <https://www.eff.org/deeplinks/2018/11/federal-researchers-complete-second-round-problematic-tattoo-recognition> [<https://perma.cc/A7GA-QG5F>].

175. *Id.*

176. MEI NGAN ET AL., *TATTOO RECOGNITION TECHNOLOGY – BEST PRACTICES (TATT-BP) GUIDELINES FOR TATTOO IMAGE COLLECTION REVISION 1.0* (U.S. Dep’t of Com., 2016), <https://nvlpubs.nist.gov/nistpubs/ir/2016/NIST.IR.8109.pdf> [<https://perma.cc/D72U-2THL>].

177. *Id.*

178. *Tattoo Recognition*, *supra* note 123.

179. *Id.*

180. Amy L. Edwards, *Inflammatory Ink: Law Enforcement Takes Advantage of Suspects’ Tattoos*, ORLANDO SENTINEL (Aug. 15, 2010, 8:01 PM), <https://www.orlandosentinel.com/news/breaking-news/os-inked-criminals-20100815-story.html> [<https://perma.cc/JX78-WRSY>].

their name or uses an alias, tattoos can help law enforcement learn the truth. If more than one person has the same name, body art can help tell them apart.¹⁸¹ Even a witness who catches a glimpse of a tattoo during a crime can describe it to a sketch artist who can then run the drawing through a tattoo database.¹⁸² A law enforcement official who spots an inking that correlates to a gang symbol can compare the image to street graffiti.¹⁸³ In other words, the possibilities are endless.

Despite incredible technological advances, there are still circumstances where primary biometric traits are not accessible, are challenging to capture, or where the properties of the images are poor.¹⁸⁴ In these cases, “soft” biometric traits such as tattoos, scars, and marks can help identify the person.¹⁸⁵ These characteristics may contain discriminatory data that helps reduce the possibilities.¹⁸⁶ This is why the police gather and store this type of demographic information in their databases. Among the many soft biometric methods, tattoos are particularly useful in forensics.¹⁸⁷

For example, an image of a person’s face may be of poor quality, or a suspect may leave only a partial fingerprint at a crime scene.¹⁸⁸ This is where tattoos can augment the identification process. As of 2018, tattoos were considered the second-best way (behind fingerprints) to identify a suspect.¹⁸⁹ Police have also used tattoos to help “map out” subcultures, gangs, and hate groups.¹⁹⁰ While tattoos can help police identify a suspect or narrow a suspect pool, a less obvious use of tattoos by law enforcement is the ability to identify a decedent.¹⁹¹

181. *Id.*

182. Aaron Mackey et al., *5 Ways Law Enforcement Will Use Tattoo Recognition Technology*, ELEC. FRONTIER FOUND. (June 2, 2016), <https://www.eff.org/deeplinks/2016/05/5-ways-law-enforcement-will-use-tattoo-recognition-technology> [<https://perma.cc/655F-AUAP>].

183. *Id.*

184. Anil Jain & Jung-Eun Lee, *Scars, Marks, and Tattoos: A Soft Biometric for Identifying Suspects and Victims*, SPIE (June 15, 2009), <https://spie.org/news/1282-scars-marks-and-tattoos-a-soft-biometric-for-identifying-suspects-and-victims?SSO=1> [<https://perma.cc/FA7Z-86E3>].

185. *Id.*

186. *Id.*

187. *Id.*

188. Jain, Lee, & Jin, *supra* note 119.

189. CNN Wire, *Tattoos Helping Police Solve Crimes More Often*, Fox13 Now (Nov. 10, 2018, 11:16 PM), <https://www.fox13now.com/2018/11/10/tattoos-helping-police-solve-crimes-more-often> [<https://perma.cc/X9DE-JLFW>].

190. Mackey et al., *supra* note 182.

191. *Id.*

The medical examiner is charged with determining the identity of a body during a postmortem examination.¹⁹² That can sometimes be a daunting task since a corpse can decompose rapidly, especially in challenging climate conditions, causing face or fingerprint identification limitations. A tattoo can overcome these challenges since the ink pigments are deeply embedded in the skin; even third-degree burns frequently do not obscure tattoos.¹⁹³ Tattoos have even proven helpful in identifying bodies from mass casualty events such as September 11th and the 2004 tsunami in Thailand.¹⁹⁴

E. CURRENT AND PROJECTED USES OF TATTOO RECOGNITION TECHNOLOGY

While the total extent of law enforcement's use of TRT remains to be determined, the EFF noted that while Tatt-C and Tatt-E "were largely academic research exercises, law enforcement is already deploying the technology."¹⁹⁵ As one example, EFF noted that law enforcement agencies in Indiana are using "GARI," a graffiti and tattoo matching application.¹⁹⁶ This acronym stands for "Gang Graffiti/Tattoo Automatic Recognition and Interpretation."¹⁹⁷ The application was developed by the Indiana Intelligence Fusion Center and Purdue University to capture, store, and analyze images of graffiti and tattoos for recognition and identification purposes.¹⁹⁸ Additionally, companies such as MorphoTrak have begun including tattoo recognition functionality in the biometric software packages they sell.¹⁹⁹

192. *Postmortem Identification*, CRIME MUSEUM, <https://www.crimemuseum.org/crime-library/forensic-investigation/postmortem-identification/> [https://perma.cc/SFX8-WMB2].

193. Mich. State Univ., *New System Helps Police Match Tattoos to Suspects*, SCI. DAILY (June 20, 2008), <https://www.sciencedaily.com/releases/2008/06/080619133057.htm> [https://perma.cc/V8XF-HH4N].

194. Richard S. Ehrlich, *Tattoos Help Identify Tsunami Victims' Bodies*, SCOOP (Jan. 18, 2005), <https://www.scoop.co.nz/stories/HL0501/S00131/tattoos-help-identify-tsunami-victims-bodies.htm?from-mobile=bottom-link-01> [https://perma.cc/8K7Z-YT6M]; Eric Lipton & James Glanz, *Limits of DNA Research Pushed to Identify the Dead of Sept. 11*, N.Y. TIMES (Apr. 22, 2002), <https://www.nytimes.com/2002/04/22/nyregion/limits-of-dna-research-pushed-to-identify-the-dead-of-sept-11.html> [https://perma.cc/LJ8X-DDGR].

195. Mackey et al., *supra* note 182.

196. *Id.*

197. *Image/Video Analytics and Recognition*, PURDUE UNIV., <https://www.purdue.edu/discoverypark/vaccine/research/image-video-analytics.php> [https://perma.cc/8R6L-BKGJ].

198. *Id.*

199. Mackey et al., *supra* note 182. MorphoTrak's biometric identification system is called MorphoBIS. *MorphoBIS, Next Generation AFIS*, OFFICER.COM (June 7, 2013), <https://www.officer.com/investigations/forensics/fingerprint-identification->

V. LEGAL ISSUES WITH TATTOOS AND TATTOO RECOGNITION TECHNOLOGY

TRT raises a host of legal issues. For instance, freedom of religion is protected under the Constitution.²⁰⁰ Therefore, it is improper for the police to target a person based upon their religious beliefs, which in the case of tattoos might involve looking at those with a cross or a Star of David etched on their bicep.²⁰¹ Tattoos may not represent the same thing to one individual as they do to another.²⁰² If a detective views a similar tattoo on multiple people, it doesn't mean those individuals have a shared interest. The pattern might have a distinctive connotation for each person.²⁰³

Using TRT to infer a commonality of interests also ignores time considerations. Even if the police identify a subject with a known gang tattoo on their body, the person may no longer be a member of that organization.²⁰⁴ The former gang member may simply lack the funds to remove the tattoo, or desire to have the inking eliminated. These examples merely expose some of the legal issues presented by TRT.²⁰⁵ The courts will ultimately decide these questions, and at least one privacy advocacy organization has already sued the Commerce, Justice, and Homeland Security departments of the federal government for information about its research into the technology that can scan the tattoos of individuals to link the wearer to a gang.²⁰⁶ The lawsuit alleged that the technology allows law enforcement to “rapidly scan anyone’s tattoos and make a myriad of assumptions about them, including falsely associating them with criminal activity.”²⁰⁷

A. LESSONS LEARNED FROM FACIAL RECOGNITION TECHNOLOGY

Tattoo recognition software is still in its infancy, and the legal issues involved with this technology have not been fully explored. Therefore, it is useful to examine facial recognition software legal issues because the tech-

equipment/product/10952493/morphotrak-morphobis-next-generation-afis [https://perma.cc/RV7G-A2V9].

200. *Id.*

201. David Bisson, *Tattoo Recognition Technology Raises Privacy, Legal Concerns*, STATE OF SEC. (June 12, 2016), <https://www.tripwire.com/state-of-security/off-topic/tattoo-recognition-technology-raises-privacy-legal-concerns/> [https://perma.cc/UR9X-4GEZ].

202. *Id.*

203. *Id.*

204. *Id.*

205. *Id.*

206. Mohana Ravindranath, *Government Sued Over Tattoo Recognition Technology*, NEXTGOV (Dec. 1, 2017), <https://www.nextgov.com/policy/2017/12/government-sued-over-tattoo-recognition-technology/144237/> [https://perma.cc/9S7G-2YQN].

207. *See Elec. Frontier Found. v. Dep't of Com.*, 2017 WL 5903486 (D.D.C. Nov. 30, 2017).

nologies are similar. They include privacy concerns, the law of search and seizure, freedoms of expression and religion, racial profiling, and the Fifth Amendment. One area with TRT that differs from facial recognition software is the possibility of a false identification due to two people having nearly identical tattoos.

A false identification occurs with facial recognition software when it matches a face with an image in the database, but that association is incorrect.²⁰⁸ This type of mistake occurs with facial recognition software when an officer “submits an image of ‘Joe,’ but the system erroneously tells the officer that the photo is of ‘Jack.’”²⁰⁹ The repercussions of such a misidentification can be dramatic.

As noted by the EFF, NIST failed to test or measure the false positivity rate in its research connected with facial recognition technology.²¹⁰ In its Tatt-E report, NIST stated that “[f]alse positive identification rates are not documented in this report. Tattoos cannot be used as a *primary* biometric as an arbitrary number of people can have nearly identical tattoos.”²¹¹ The second area of concern related to TRT, also prevalent in facial recognition technology, is the possibility for racial bias.

According to Alex Najibi, a PhD candidate at Harvard University, the use of facial recognition technology creates “significant racial bias, particularly against Black Americans.”²¹² As Najibi recognized, facial recognition technologies have shown “divergent error rates” concerning different demographic groups.²¹³ These error rates are highest with eighteen-to-thirty-year-old Black females.²¹⁴ The researcher goes on to note that the mere utilization of face recognition technology poses a risk to cause racial discrimination because the technology may “disproportionately harm[] the Black community in line with existing racist patterns of law enforcement.”²¹⁵ While this unequal treatment of racial minorities posed by TRT has not yet been addressed at any great length, one paper notes:

208. *Face Recognition*, ELEC. FRONTIER FOUND. (Oct. 24, 2017), <https://www.eff.org/pages/face-recognition> [<https://perma.cc/Y46W-2K8H>].

209. *Id.*

210. Dave Maass, *Federal Researchers Complete Second Round of Problematic Tattoo Recognition Experiments*, ELEC. FRONTIER FOUND. (Nov. 13, 2018), <https://www.eff.org/deeplinks/2018/11/federal-researchers-complete-second-round-problematic-tattoo-recognition> [<https://perma.cc/HU3Q-EXJE>].

211. NGAN ET AL., *supra* note 144.

212. Alex Najibi, *Racial Discrimination in Face Recognition Technology*, HARV. UNIV. SCH. OF ARTS & SCI. (Oct. 24, 2020), <https://sitn.hms.harvard.edu/flash/2020/racial-discrimination-in-face-recognition-technology/> [<https://perma.cc/8HYN-RZfv>].

213. *Id.*

214. *Id.*

215. *Id.*

The use of biometric tools and databases amplify the effects of racist policing practices. Because policing practices in the US disproportionately surveil and target people of color and immigrants, a disproportionate number of Black people and non-Black people of color and immigrants are in these databases, which in turns means the technology is disproportionately used on Black and brown people.²¹⁶

In addition to the substantive issues with the deployment and use of TRT by law enforcement, the EFF has criticized the methods by which Tatt-C and Tatt-E were conducted.²¹⁷ The EFF has sued the Department of Commerce (including the NIST), the Department of Justice (including the FBI), and the Department of Homeland Security in federal court for their deeply troubling research practices.²¹⁸ The lawsuit is premised upon a claim under the Freedom of Information Act.²¹⁹ A subsequent investigation by the EFF revealed these tattoo-related government programs “exploit[ed] inmates, with little regard for the research’s implications for privacy, free expression, religious freedom, and the right to associate.”²²⁰

The database of fifteen thousand tattoo images that NIST provided to private institutions and public universities to conduct Tatt-C testing included images of tattoos that the FBI obtained.²²¹ Most of these pictures were from prisoners.²²² Many of these detainees were not aware that their images were being used in this project, preventing them from providing proper

216. *Surveillance Tools*, OHCHR, <https://www.ohchr.org/Documents/Issues/Racism/SR/Call/nyu.pdf> [<https://perma.cc/W2NA-TW2M>].

217. See *NIST Tattoo Recognition Technology Program FOIA*, *supra* note 151.

218. Complaint at 2-5, *Elec. Frontier Found. v. Dep’t of Com.*, *supra* note 164; Dave Maass, *Documents Bare How Federal Researchers Went to Absurd Lengths to Undo Problematic Tattoo Recognition Research*, ELEC. FRONTIER FOUND. (Aug. 21, 2018), <https://www.eff.org/deeplinks/2018/08/eff-bares-how-federal-researchers-went-absurd-lengths-undo-problematic-tattoo> [<https://perma.cc/T5XP-6Y6J>].

219. Complaint at 1, *Elec. Frontier Found. v. Dep’t of Com.*, *supra* note 164.

220. Aaron Mackey & Dave Maass, *Tattoo Recognition Research Threatens Free Speech and Privacy*, ELEC. FRONTIER FOUND. (June 2, 2016), <https://www.eff.org/deeplinks/2016/06/la-investigacion-sobre-el-reconocimiento-de-tatuajes-atenta-contrala-libertad-de> [<https://perma.cc/X3LE-PVH3>].

221. Complaint at 17, *Elec. Frontier Found. v. Dep’t of Com.*, *supra* note 164.

222. Eric Weiss, *EFF Raises Ethical Concerns About NIST’s Tatt-C Tattoo Recognition Database*, FIND BIOMETRICS (Mar. 19, 2020), <https://findbiometrics.com/eff-raises-ethical-concerns-about-nists-tatt-c-tattoo-recognition-database-031901/> [<https://perma.cc/C4DM-6BJT>].

consent.²²³ This failure is considered to be a violation of the federal rules for ethical research.²²⁴ Additionally, the EFF contends that NIST failed to protect the personal information of those whose tattoos were shared in the dataset by failing to “scrub people’s personal information” such as their names, faces, and birth dates from the photographs.²²⁵

B. FIRST AMENDMENT CLAIMS

The First Amendment safeguards individuals from attempts by the government to regulate expression.²²⁶ Fundamental to a free society is the conviction that each member can choose, unencumbered from government meddling, what opinions to express.²²⁷ “Freedom of expression would not truly exist” if it could only be exercised subject to the whim of a “benevolent government.”²²⁸ However, not everything is free speech. Some opinions have “such slight social value . . . that any benefit that may be derived from [it] is clearly outweighed by the social interest in order and morality.”²²⁹ Instances of unprotected communications include fighting words, obscenity, and defamation.²³⁰

Tattoos frequently depict important moments or events in a person’s life, memorialize rites of passage, demonstrate religious affiliations, or espouse feelings about others.²³¹ Obtaining a tattoo permits a person to make “permanent that which is fleeting.”²³² The First Amendment forbids laws abridging the freedom of speech.²³³ The Supreme Court has interpreted this terminology as protecting not only political statements, but also nontraditional communicative media such as dance, film, music, and expressive

223. *Id.*

224. Janus Rose, *US Government Used Prisoners to Train Tattoo Recognition Algorithms*, VICE (June 2, 2016), <https://www.vice.com/en/article/4xan33/us-government-used-prisoners-to-train-a-tattoo-recognition-algorithm> [<https://perma.cc/T7WN-DH65>].

225. Weiss, *supra* note 222.

226. Matthew Alan Cherep, *Comment, Barbie Can Get A Tattoo, Why Can't I?: First Amendment Protection of Tattooing In a Barbie World*, 46 WAKE FOREST L. REV. 331 (2021).

227. *Id.*

228. *Id.*

229. *Id.*

230. *Id.*

231. Jordie Bacon, *Tattoo Rights Inked Into the Constitution: Why Tattoos Are Protected Speech Under the First Amendment*, U. CIN. L. REV. (May 18, 2016), <https://uclawreview.org/2016/05/18/tattoo-rights-inked-into-the-constitution-why-tattoos-are-protected-speech-under-the-first-amendment/> [<https://perma.cc/849K-D8F9>].

232. *Id.*

233. Ryan J. Walsh, *Painting on a Canvas of Skin: Tattooing and the First Amendment*, 78 U. CHI. L. REV. 1063 (2011).

action. These actions include such things as burning the American flag or refusing to stand for the playing of the National Anthem.²³⁴

The Court has also opined with little clarification that the First Amendment protects “artistic expression.”²³⁵ As Justice Souter noted, “[i]t goes without saying that artistic expression lies within this First Amendment protection.”²³⁶ Against this backdrop, courts are split over whether tattooing is a protected artistic medium.²³⁷ Many courts reject their artistic merit and deny tattoos protection under the First Amendment.²³⁸ Others have ruled that body ink is a First Amendment protected right.²³⁹

Is a tattoo pure speech or not speech at all? Is it expressive or non-expressive behavior? The answers to these questions are contingent on whether body art is separated from the tattoo itself or if the practice of this form of expression is intimately linked to the tattoo.²⁴⁰ Courts that separate the tattoo procedure from the tattoo find that there is no First Amendment guarantee.²⁴¹ Those that deem the tattooing process interrelated with the tattoo provide First Amendment protections. Thus, the judiciary is split on whether body ink is pure speech or behavior with a mere expressive aspect.²⁴² Most of the recent decisions, however, have recognized tattoos as a form of free speech.²⁴³ As noted in *Anderson v. City of Hermosa Beach*, “[t]here appears to be little dispute that the tattoo itself is pure First Amendment ‘speech,’”²⁴⁴ an “activity fully protected by the First Amendment.”²⁴⁵

In *Coleman v. City of Mesa*, the plaintiff was denied a permit to operate a tattoo parlor, so he sued, asserting that his rights to freedom of speech were violated.²⁴⁶ The court defined tattooing as:

234. *Id.*

235. *Id.*

236. Nat’l Endowment for the Arts v. Finley, 524 U.S. 569, 602 (1998) (Souter, J., dissenting).

237. Walsh, *supra* note 233, at 1064.

238. *Id.*

239. *Id.*

240. See Kelly-Ann Weimar, Comment, *A Picture is Worth a Thousand Words: Tattoos and Tattooing Under the First Amendment*, 7 ARIZ. SUMMIT L. REV. 719 (2014).

241. *Id.* at 720; See also David L. Hudson, Jr., *Tattoos*, FIRST AMEND. ENCYC., <https://www.mtsu.edu/first-amendment/article/1149/tattoos> [<https://perma.cc/M62E-CGQ2>] (Examples of cases that have not found tattoos to be protected under the First Amendment are: State *ex rel.* Med. Licensing Bd., 492 N.E.2d 34 (Ind. Ct. App. 1986) and Yurkew v. Sinclair, 495 F. Supp. 1248 (D. Minn. 1980)).

242. Weimar, *supra* note 240, at 720.

243. David L. Hudson, Jr., *Tattoos*, FIRST AMEND. ENCYC., <https://www.mtsu.edu/first-amendment/article/1149/tattoos> [<https://perma.cc/M62E-CGQ2>].

244. *Anderson v. City of Hermosa Beach*, 621 F.3d 1051, 1060 (9th Cir. 2010).

245. *Id.*

246. *Coleman v. City of Mesa*, 284 P.3d 863 (Ariz. 2012) (en banc).

mark[ing] the skin with any indelible design, letter, scroll, figure, symbol or any other mark that is placed by the aid of needles or other instruments upon or under the skin with any substance that will leave color under the skin and that cannot be removed, repaired or reconstructed without a surgical procedure.²⁴⁷

To ascertain if a person's First Amendment rights have been violated, the court must ascertain whether tattooing is a constitutionally safeguarded expression.²⁴⁸ The court employs the terms "purely expressive activity" and "pure speech" to reference not only written or spoken words but also other mediums whose principal purpose is to articulate thoughts, emotions, or ideas.²⁴⁹ If tattooing is classified as actions with an expressive part, it will be protected under the First Amendment if it is "sufficiently imbued with elements of communication."²⁵⁰ In other words, there is "[a]n intent to convey a particularized message" and "the likelihood [is] great that the message [will] be understood" by observers.²⁵¹ In this regard, several courts have ruled that the art of tattooing is pure speech and protected by the First Amendment. After all, the tattoo includes expressive parts outside those represented in "a pen-and-ink" drawing.²⁵² It demonstrates the artist's abilities and the self-expression of the individual exhibiting the tattoo's permanent display.²⁵³

Public employees, on occasion, have maintained that the First Amendment protects their tattoos as a form of free speech.²⁵⁴ The law provides that if these workers express an opinion as a citizen on a matter of public interest, the employer may not punish the employee unless the

247. *Id.* at 867.

248. *Id.* at 868.

249. *Id.* at 869.

250. *Id.*

251. *Coleman*, 284 P.3d at 869.

252. *Id.* at 870.

253. *Id.*

254. Stephen Allred, *Rejecting the Tattooed Applicant, Disciplining the Tattooed Employee: What Are the Risks?*, 67 LAB. L.J. 475, 477 (2016), <https://scholarship.richmond.edu/cgi/viewcontent.cgi?article=2326&context=law-faculty-publications> [<https://perma.cc/2GYG-KRFZ>].

speech is overly disruptive of the employer's business.²⁵⁵ This protection, however, does not apply to private employers.²⁵⁶

In *Medici v. City of Chicago*,²⁵⁷ police officers in Chicago challenged a directive requiring those “representing the Department, whether in uniform, conservative business attire or casual dress,” to conceal tattoos on their hands, face, neck, and other areas not covered by clothing, with skin tone bandages or covers.²⁵⁸ The plaintiffs asserted that this policy violated their First Amendment rights.²⁵⁹

The court disagreed and opined that the plaintiffs' tattoos are a personal expression and not a type of speech on a public matter. On-duty police are not part of the general population but government officials whose speech may be restricted.²⁶⁰ Their tattoos do not involve citizens commenting on matters of public concern. The defendant's interest in preserving a professional and uniform police department significantly overshadows the interest of the police officers in personal expressions by showing their body art while on duty.²⁶¹

An unusual twist involving a tattoo and freedom of speech claim arose in *Martin v. State*.²⁶² The appellant was considered a gang leader and was indicted for the murder of another gang member.²⁶³ The government introduced a picture of his tattoo during the trial. The body art showed an image of a rat with its mouth taped shut. Next to the rat was the drawing of a woman holding her index finger to her lips, along with a depiction of the murder.²⁶⁴ The defense argued that it was improper to admit this picture into evidence since it was not relevant or probative and only served to prejudice the jury.²⁶⁵ The defendant claimed that there is a no-snitch mentality among young people and that the tattoo was prejudicial because it depicted a call for informants not to cooperate with the police.²⁶⁶

The court disagreed and opined that the tattoo was relevant since it demonstrated that the defendant was involved with the murder, and it was

255. *Id.*

256. Kira Goldring, *The Perspective on Tattoos*, PERSP., <http://dev.theperspective.com/debates/living/the-perspective-on-tattoos/> [https://perma.cc/TL3H-L3XX].

257. *Medici v. City of Chicago*, 144 F. Supp. 3d 984 (N.D. Ill. 2015).

258. *Id.* at 986.

259. *Id.*

260. *Id.* at 988.

261. *Id.*

262. *Martin v. State*, 570 S.W.3d 426 (Tex. App. 2019).

263. *Id.* at 432.

264. *Id.* at 433.

265. *Id.* at 436.

266. *Id.*

highly probative of the events surrounding the killing.²⁶⁷ It could also be viewed as a confession to the killing. The defendant then claimed that body art was an expression of his cultural feelings and opinion concerning snitches and was thus protected by the First Amendment.²⁶⁸ The court again disagreed and noted that while a tattoo may be shielded as free speech, the guarantee does not bar its evidentiary use to prove motive or the elements of a crime.²⁶⁹ In this case, the tattoo was relevant.²⁷⁰

C. FOURTH AMENDMENT CLAIMS

The use of TRT can cause privacy, safety, and civil rights concerns.²⁷¹ As with the more advanced and widely used facial recognition software,²⁷² there are no federal laws or framework that currently regulate this tattoo technology. The Constitution, however, should provide some restrictions on the use of these computer applications by law enforcement agencies at the federal, state, and local levels.²⁷³ One such safeguard is the protection of citizens under the Fourth Amendment. This guarantee is intended to protect against unreasonable searches and seizures, and other safeguards obtained from legislation and case law.²⁷⁴

Katz v. United States is the seminal case involving the reasonable expectation of privacy standard under the Fourth Amendment.²⁷⁵ This matter involved whether taking a picture or video of a person in a public place implicated the protections offered by the Fourth Amendment.²⁷⁶ As the Supreme Court noted, “[w]hat a person knowingly exposes to the public, even in his own home or office, is not subject of Fourth Amendment protection.”²⁷⁷ In affirming the dismissal of plaintiffs’ constitutional claims, the Court of Appeals of Michigan stated, “we cannot reasonably declare that

267. *Martin*, 570 S.W.3d at 437.

268. *Id.* at 439.

269. *Id.*

270. *Id.*

271. See Nicole Martin, *The Major Concerns Around Facial Recognition Technology*, FORBES (Sept. 25, 2019), <https://www.forbes.com/sites/nicolemartin1/2019/09/25/the-major-concerns-around-facial-recognition-technology/?sh=43cdb6004fe3> [<https://perma.cc/DHU4-F77R>].

272. See KELSEY Y. SANTAMARIA, FACIAL RECOGNITION TECHNOLOGY AND LAW ENFORCEMENT: SELECT CONSTITUTIONAL CONSIDERATIONS 7 (Cong. Rsch. Serv. 2020), <https://crsreports.congress.gov/product/pdf/R/R46541> [<https://perma.cc/4NNL-MY57>].

273. See *id.* at 3.

274. Samuel D. Hodge, Jr., *Big Brother is Watching: Law Enforcement's Use of Digital Technology in the Twenty-First Century*, 89 U. CIN. L. REV. 30, 34 (2020).

275. *Katz v. United States*, 389 U.S. 347 (1967).

276. *Id.*

277. *Id.* at 351.

the taking of a photograph of plaintiffs that merely depicts them as they appeared in public to be a search under the Fourth Amendment.”²⁷⁸

Ever since *Katz*, courts have grappled with the subjective and objective workings of a reasonable expectation of privacy that people will understand.²⁷⁹ A tattoo exposed to the public because it is not covered by clothing should be considered visible to the general public,²⁸⁰ and not subject to the Fourth Amendment’s privacy protections.²⁸¹ However, one researcher pondered two “less established Fourth Amendment theories” that could potentially be used to challenge TRT.²⁸²

Andrew Wright, an associate professor at Savannah Law School, asserted that, “a mosaic theory approach to reasonableness could potentially establish [Fourth Amendment] constitutional limits on tattoo recognition.”²⁸³ A traditional Fourth Amendment analysis initially involves assessing whether each act is a search by itself.²⁸⁴ Next, the alleged act is examined for reasonableness.²⁸⁵ Conversely, “under [the] mosaic theory, a series of government acts of surveillance would be analyzed as a whole.”²⁸⁶

This scholar also addressed the line of cases where courts had recognized that a search for Fourth Amendment purposes had occurred when technology was used “that transcend[ed] human sensory capacity.”²⁸⁷ But, it would likely be challenging to establish that photographing a publicly visible tattoo would transcend human vision.

United States v. Anthony considered whether the government’s taking a picture of the defendant’s tattoo, to show to the jury, would violate his Fourth Amendment privacy protections.²⁸⁸ The defendant asserted that the search of his body for tattoos constituted an unjustified intrusion into his privacy.²⁸⁹ In considering the reasonableness of a physically intrusive search, the court “must balance the government’s need for the particular search against the invasion of personal rights entailed by the search.”²⁹⁰ The court had previously held that searching for a tattoo not openly visible to

278. *Johnson v. VanderKooi*, 948 N.W.2d 650, 653, 663 (Mich. Ct. App. 2019).

279. Andrew McCause Wright, *Civil Society and Cybersurveillance*, 70 ARK. L. REV. 745, 755-56 (2017).

280. *Id.* at 756.

281. *Id.* at 767.

282. *Id.*

283. *Id.*

284. McCause Wright, *supra* note 279, at 767.

285. *Id.*

286. *Id.* at 758.

287. *Id.* at 767.

288. *United States v. Anthony*, No. 18-cr-00012, 2019 WL 471984 (W.D. Va. Feb. 5, 2019).

289. *Id.*

290. *Id.*

the public would violate a person's constitutional rights.²⁹¹ But, suppose the pictures deal with the person's head, face, neck, arm, and hand. In that case, there is no intimate privacy interests since these areas are exposed regularly and represent no invasion of personal rights.²⁹²

Likewise, in *Garcia v. State*, a Texas court found that it did not violate the defendant's rights to privacy when tattoos located on the front of the neck, forearms, and calves are photographed.²⁹³ These are places that are openly visible to the public.²⁹⁴

On the other hand, a Fourth Amendment violation was found in *Pace v. City of Des Moines*.²⁹⁵ The facts show that the police received a call from a woman who asserted that she was assaulted by a man brandishing a knife. The victim's description of the assailant led an officer to suspect Mr. Pace.²⁹⁶ The policeman went to the plaintiff's house, pulled his gun, and told the man to come outside. When this occurred, he pushed the suspect up against a wall.²⁹⁷ The cop then ordered the plaintiff to take off his shirt so he could photograph the tattoo on the suspect's chest, and the man complied. The plaintiff maintained that this sequence constituted an unlawful search and seizure, since the officer had no probable cause and failed to secure a warrant before grabbing and photographing him.²⁹⁸

The officer claimed that detaining and photographing the plaintiff without his consent was allowed under the Fourth Amendment. The justification was that "the obtaining of physical evidence from a person involves a potential Fourth Amendment violation at two different levels—the 'seizure' of the 'person' necessary to bring him into contact with government agents . . . and the subsequent search for and seizure of the evidence."²⁹⁹ The officer further maintained that the directive for the suspect to remove his shirt was valid because he lacked a reasonable expectation of privacy concerning his upper body.³⁰⁰ The officer asserted "that on 'two or three' [prior] occasions" the suspect was seen in public wearing tank tops that partly displayed the tattoo on the suspect's chest.³⁰¹ Given this conduct, the cop claimed that the plaintiff could not have reasonably expected the area of his upper body, and especially his tattoo, be kept private.³⁰² The court

291. *Id.*

292. *Id.*

293. *Garcia v. State*, 239 S.W.3d 862, 868 (Tex. App. 1st Dist. 2007).

294. *Id.*

295. *Pace v. City of Des Moines*, 201 F.3d 1050, 1053 (8th Cir. 2000).

296. *Id.* at 1052.

297. *Id.*

298. *Id.*

299. *Id.*

300. *Pace*, 201 F.3d at 1053.

301. *Id.*

302. *Id.*

disagreed and opined that any reasonable officer would have concluded that the action of taking a picture of the tattoo under the circumstances violated the suspect's Fourth Amendment rights.³⁰³

A person's right to privacy is severely limited once that individual is incarcerated. While on parole, the defendant in *State v. Tiner* killed a person and disposed of the body in a wooded area.³⁰⁴ Because of an unrelated crime, he was sent to jail, where he associated with members of a white-supremacist group.³⁰⁵ Defendant's upper body displayed several tattoos signifying sympathy for white supremacy, including a swastika, and the words "White" and "Pride." He also used a Nazi symbol, SS lightning bolts, in a letter to his wife.³⁰⁶

The man was subsequently charged with the murder of the victim.³⁰⁷ While in jail awaiting trial, the State notified him that it wanted to take pictures of his tattoos. The defendant initially refused, but after the government told him that he had no choice, he allowed pictures to be taken of the tattoos on his upper body.³⁰⁸ The pictures were taken because the State wanted an expert to look at the body art to ascertain the defendant's affiliation with a white-supremacist gang.³⁰⁹ The defendant objected, asserting that taking photographs of his tattoos amounted to an unlawful search.³¹⁰ More specifically, he claimed that "[p]hotographing the skin on defendant's upper arms and stomach constitutes a search of defendant's person for it reveals that which is private and not knowingly exposed to the public: the skin underlying one's normal clothing."³¹¹ The court disagreed and opined that nothing in the United States Constitution mandates a search warrant before the government may take pictures of or inspect defendant's torso. Once he became a prisoner, the defendant had few rights regarding privacy.³¹² Among the guarantees that he lost was the right to keep his personal appearance, including any distinguishing marks, such as tattoos, from being discovered by the government.³¹³ Therefore, the prosecution could force the prisoner to remove his shirt so that they could photograph his tattoos without violating the Fourth Amendment.³¹⁴

303. *Id.*

304. *State v. Tiner*, 135 P.3d 305, 307 (Or. 2006).

305. *Id.*

306. *Id.*

307. *Id.*

308. *Id.* at 310.

309. *Tiner*, 135 P.3d at 310.

310. *Id.*

311. *Id.* at 312.

312. *Id.*

313. *Id.*

314. *Tiner*, 135 P.3d at 305.

D. FIFTH AMENDMENT CLAIMS

The Fifth Amendment is one of the most recognized protections under the Constitution, and it provides in part that no person “shall be compelled in any criminal case to be a witness against himself.”³¹⁵ This guarantee not only shields a person against being involuntarily called as a witness against herself in a criminal proceeding, but it also protects the person from having to answer questions in any other proceeding where the responses might implicate her in other criminal matters.³¹⁶ To qualify for this protection, “a communication must be testimonial, incriminating, and compelled.”³¹⁷ Not only does this guarantee apply to trials, but it also includes situations outside of the courtroom that involve the curtailment of personal liberties.³¹⁸

The Supreme Court has interpreted this guarantee to apply to testimony or communications but not physical evidence.³¹⁹ This means that evidence such as blood type, DNA results, weight, height, and fingerprints are not shielded.³²⁰ Several Fifth Amendment cases have arisen concerning tattoos. Permitting the government to introduce photographs of body tattoos of a suspect accused of perpetrating a hate crime has been ruled not to constitute an infringement of the Fifth Amendment guarantee against self-incrimination.³²¹

The issue in *People v. Slavin* was whether the government could introduce evidence of tattoos not pertinent to showing a person’s physical appearance, condition, or identity.³²² Instead, they were used for their “testimonial value” and in a “communicative context.”³²³ The facts reveal that the defendant and a co-conspirator enticed two Mexican “day laborers” into their car with the promise of work. They drove the immigrants to an abandoned building and brutally attacked them.³²⁴ The defendant was subsequently arrested. Over his objections, the police photographed his tattoos even though the victims never saw the body art during the assault.³²⁵ On the back of defendant’s neck, he had a tattoo with the letters “A.C.A.B.” (“All

315. U.S. CONST. amend. V.

316. JUSTICE ROBERT STEIGMANN & LORI A. NICHOLSON, 2 ILLINOIS EVIDENCE MANUAL § 15:1 (4th ed. 2020).

317. *Id.*

318. U.S. CONST. amend. V.

319. *Schmerber v. California*, 384 U.S. 757, 760-65 (1966).

320. *Ask the Lawyer: Tattoos and the Law*, DAILY BREEZE (Sept. 6, 2017, 7:52 AM), <https://www.dailybreeze.com/2012/02/13/ask-the-lawyer-tattoos-and-the-law/> [https://perma.cc/46JF-YLV8].

321. HATE CRIMES LAW § 2:16 (2020).

322. *People v. Slavin*, 807 N.E.2d 259 (N.Y. 2004).

323. *Id.* at 260.

324. *Id.* at 261.

325. *Id.*

Cops Are Bastards”), and on his right upper arm, the letters “F.T.W.” (“Fuck The World”).³²⁶ On his chest was a Nazi swastika, with a fist encircled by a Celtic cross.³²⁷

The government used the pictures of the tattoos to secure an indictment. The defendant objected and claimed that his Fifth Amendment rights had been violated and moved to dismiss the indictment. Failing that, he wanted to preclude the use of the photographs at trial.³²⁸ These motions were denied, and the prosecution introduced the pictures of the tattoos at trial through the testimony of the defendant’s friend.³²⁹ The government also called an expert in hate crimes who explained the meaning of the letters, symbols, and pictures depicted in the tattoos.³³⁰

The defendant was convicted and argued on appeal that the pictures were used to prove the motive for perpetrating a hate crime since the tattoos disclosed his subjective opinions and philosophies on race.³³¹ This, he claimed, represented compelled testimony prohibited by the Fifth Amendment.³³² The court disagreed and noted that the protection does not prevent a defendant from being forced to display physical characteristics.³³³ The Fifth Amendment does not prohibit requiring the production of evidence that a defendant created in the past, even if that evidence displays “incriminating assertions of fact or belief.”³³⁴ Nothing occurred that invoked the defendant’s rights against self-incrimination. The police lawfully took photographs of the tattoos that the defendant voluntarily created.³³⁵

The courts uniformly find that for reasons of identification, the defendant may be compelled to stand and face the jury or a witness without infringing upon his right against self-incrimination.³³⁶ Requiring the accused to face the fact-finder is not forcing him to provide evidence of guilt.³³⁷ Does this same approach apply to in-court identification of a tat-

326. *Id.*

327. *Slavin*, 807 N.E.2d at 261.

328. *Id.*

329. *Id.* at 262.

330. *Id.*

331. *Id.* at 263.

332. *Slavin*, 807 N.E.2d at 263.

333. *Id.*

334. *Id.* at 264.

335. *Id.*

336. *Evidence-Constitutional Law – Self Incrimination, Applied to Method of Identification*, 8 IND. L.J. 558 (1933), <https://www.repository.law.indiana.edu/ilj/vol8/iss9/7> [<https://perma.cc/Y8AH-ZQZE>].

337. *Id.* at 559.

too? After all, a witness will often remember a tattoo as an easy way of identifying a suspect.³³⁸

Tattoos as an identification tool are different from tattoos as evidence. Counsel occasionally desires to offer proof of an identifying physical characteristic of the opposing party. While such evidence is frequently not contested, such as the color of a person's hair or the presence of a scar, there can be times when an attempt to present such evidence raises a self-incrimination question.³³⁹ This can occur with the displaying of a tattoo as a means of an in-court identification. As the Second Circuit commented in a footnote in *United States v. McCarthy*, "cases are legion that an accused can be required, without violating his privilege against self-incrimination, to submit his bodily or other identifying features for inspection."³⁴⁰

Other recent cases have expanded upon this principle. *State v. Creamer* involved a defendant convicted of various crimes involving the theft of a purse and multiple attempts to use an automated teller machine card found in that purse.³⁴¹ The criminal was seen on surveillance videos at two different locations. At the time of trial, the district attorney learned that one of the bank tellers could identify the culprit by his tattoos. The defendant maintained that it was improper for this identifying testimony to be allowed.³⁴² The court ruled that it is permissible for a judge to tell the defendant to display his tattoos when they are relevant to identifying the perpetrator of the crime, and where the trial judge has weighed the probative value of such evidence against the danger of unfair prejudice.³⁴³ In the matter, the lower court did not abuse its discretion in allowing the tattoos for identification.³⁴⁴

Likewise, in *State v. Gallegos*, the court noted that physical characteristics, such as a tattoo, that help identify a suspect are non-testimonial evidence.³⁴⁵ Compelling such evidence does not implicate the Fifth Amendment because the guarantee against self-incrimination "is limited to disclosures that are 'communicative' or 'testimonial' in nature and does not include identifying physical features."³⁴⁶ While this was a case of first impression in New Mexico, other courts have found that tattoos used

338. *Tattoos: Body Art, Boast, Confession? When Body Ink Meets the Legal System*, NOVICK & ASSOC., <https://topbostoncriminallawyer.com/can-tattoos-used-evidence-2/#:~:text=Tattoos%20are%20nothing%20new%20in,things%20for%20many%20different%20reasons> [https://perma.cc/J7WC-UJQU].

339. KENNETH M. MOGILL & LIA N. ERNST, EXAMINATION OF WITNESSES, § 9:21 (2d ed. 2020).

340. *United States v. McCarthy*, 473 F.2d 300, 304 n.3 (2d Cir. 1972).

341. *State v. Creamer*, No. 11-0848, 2012 WL 3079158 (W. Va. Apr. 16, 2012).

342. *Id.*

343. *Id.*

344. *Id.*

345. *State v. Gallegos*, 853 P.2d 160 (N.M. App. 1993).

346. *Id.* at 161.

to identify an individual or rebut a witness's identification are allowed as demonstrative evidence.³⁴⁷

The Alabama Court of Criminal Appeals faced a similar question in *Walker v. State*.³⁴⁸ The appellant was convicted of possession of cocaine.³⁴⁹ On appeal, he argued that his Fifth Amendment right against self-incrimination was violated, because the trial court ordered him to display his tattoo.³⁵⁰ At trial, two witnesses testified that they could not tell the defendant apart from his twin brother unless the witnesses could see the distinguishing tattoo.³⁵¹ Accordingly, the trial court ordered the defendant to display his tattoo.³⁵² The appellate court opined that the Fifth Amendment did not protect the displaying of the tattoo because doing so was not "communicative or testimonial in nature."³⁵³

In *United States v. Greer*, the defendant maintained that the government had violated his Fifth Amendment right against self-incrimination "by using the name tattooed on his arm to link him to the car in which ammunition was found."³⁵⁴ After searching an unoccupied car, a detective found ammunition, a paystub and receipt with the defendant's name on them, and a car rental agreement which displayed the name "Tangela Hudson."³⁵⁵ After the police located the defendant, the detective identified a tattoo on his left arm that said "Tangela."³⁵⁶

On appeal, the defendant argued that his right against self-incrimination was violated when the government relied on his tattoo to link him to the vehicle.³⁵⁷ The Second Circuit found that the defendant's right against self-incrimination was not violated because "[t]he tattoo . . . was not compelled by the government."³⁵⁸ The court reasoned that the tattoo was not coerced, because the detective observed the tattoo on the defendant's arm after the arrest.³⁵⁹ Furthermore, the court stated that the tattoo would not be compelled even if the officers could only see the tattoo by applying

347. *Id.*

348. *Walker v. State*, 706 So. 2d 1303 (Ala. Crim. App. 1997).

349. *Id.* at 1304.

350. *Id.*

351. *Id.* The defendant's tattoo was of the letters "NW," while his brother's tattoo was of the letters "MW."

352. *Id.*

353. *Walker*, 706 So. 2d at 1304.

354. *United States v. Greer*, 631 F.3d 608, 610 (2d Cir. 2011).

355. *Id.* at 611.

356. *Id.*

357. *Id.*

358. *Id.* at 613.

359. *Greer*, 631 F.3d at 613.

physical force.³⁶⁰ As noted, “[i]n the absence of compulsion, Greer’s Fifth Amendment claim fails.”³⁶¹

E. EQUAL PROTECTION CLAUSE AND TITLE VII

There have been numerous reports, stories, and cases focused on tattoo-bearing applicants or employees being denied jobs, being disciplined, or being fired.³⁶² Public sector applicants for employment and workers have pursued claims for such employer conduct under the First and Fourteenth Amendments of the United States Constitution. On the other hand, private sector employees and applicants have resorted to seeking similar redress under Title VII of the Civil Rights Act or state discrimination laws.³⁶³

The Equal Protection Clause of the Fourteenth Amendment prohibits any state from “deny[ing] to any person within its jurisdiction the equal protection of the laws.”³⁶⁴ As described by one author, in the context of employment discrimination, the Equal Protection Clause prescribes equal treatment of all similarly situated employees.³⁶⁵ Accordingly, an applicant or employee bringing a Fourteenth Amendment claim must demonstrate that he or she is or was: (i) a member of a protected class, (ii) situated similarly to members of an unprotected class, and (iii) treated in a manner that was different from those members of the unprotected class.³⁶⁶ The writer identified two similar cases where police officers made Equal Protection challenges to their respective departments’ policies requiring them to cover their tattoos.³⁶⁷

In *Inturri v. City of Hartford*, five police officer plaintiffs brought suit against the City of Hartford, Connecticut, and its former chief of police as part of a constitutional challenge to the police department’s uniform and appearance regulations.³⁶⁸ The challenged regulations provided that “the Chief of Police has the authority to order personnel to cover tattoos that are deemed offensive and/or presenting an unprofessional appearance.”³⁶⁹

In affirming the trial court’s grant of the defendants’ summary judgment, the Second Circuit elected to apply a rational basis scrutiny standard

360. *Id.*

361. *Id.*

362. Stephen Allred, *Rejecting the Tattooed Applicant, Disciplining the Tattooed Employee: What are the Risks?*, 67 LAB. L. J. 475 (2016).

363. *Id.*

364. U.S. CONST. amend. XIV, § 1.

365. Allred, *supra* note 362, at 476.

366. *Id.*

367. *Id.*

368. *Inturri v. City of Hartford*, 365 F. Supp. 2d 240, 243 (D. Conn. 2005).

369. *Id.*

to the plaintiffs' equal protection claim.³⁷⁰ The court found "no difficulty in determining that it was rational for the police chief to require police officers to cover a tattoo which could reasonably have been perceived as a racist symbol."³⁷¹ The court further reasoned that because there was not a showing that other officers had tattoos that "could be interpreted as racist," the plaintiffs' Equal Protection claim failed to show how they had been treated any differently from officers in a similar situation.³⁷²

In a similar case, the District Court for the Northern District of Texas stated that it would apply a strict scrutiny analysis to a police officer's claim, because he "allege[d] discrimination . . . based on his race, sex, national origin, and his exercise of his fundamental right of free expression . . ."³⁷³ In *Riggs v. City of Fort Worth*, the plaintiff was notified that he was prohibited from wearing shorts or a short-sleeve shirt while on duty because of his "extensive tattoos."³⁷⁴

The court stated that "a law enforcement agency's '[c]hoice of organization, dress, and equipment for law enforcement personnel is a decision entitled to the same sort of presumption of legislative validity as are state choices designed to promote other aims within the cognizance of the State's police power."³⁷⁵ Accordingly, the court concluded that the police chief "had legitimate, nondiscriminatory reasons for requiring the only officer in the Fort Worth Police Department who has tattoos covering his legs and arms . . . to wear a uniform that is not required of other police officers."³⁷⁶

In *Roberts v. Ward*, a seasonal worker challenged a park director's "new professional appearance policy . . ."³⁷⁷ In part, the policy addressed hair length, body piercings, tattoos, and uniforms.³⁷⁸ The plaintiff alleged this policy violated the Equal Protection Clause, because it was "more onerous . . . on manual laborers . . . than it [was] on office workers."³⁷⁹ The Sixth Circuit affirmed the district court's grant of qualified immunity to the commissioner, because the policy applied to all park workers, and because the plaintiffs failed to show that they were members of a class that was "historically . . . the victim of discrimination or otherwise reflects invidious discrimination."³⁸⁰ Under Title VII of the Civil Rights Act, Congress has made it unlawful for:

370. *Inturri v. City of Hartford*, 165 F. App'x. 66, 69 (2d Cir. 2006).

371. *Id.*

372. *Id.* at 69-70.

373. *Riggs v. City of Fort Worth*, 229 F. Supp. 2d 572, 578 (N.D. Tex. 2002).

374. *Id.* at 574-75.

375. *Id.* (quoting *Kelley v. Johnson*, 425 U.S. 238, 247 (1976)).

376. *Id.* at 581-82.

377. *Roberts v. Ward*, 468 F.3d 963, 964-65 (6th Cir. 2006).

378. *Id.* at 964.

379. *Id.* at 970.

380. *Id.*

An employer . . . to fail or refuse to hire or to discharge any individual, or otherwise to discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, or national origin.³⁸¹

Title VII protects employees and applicants from various types of discrimination in the workplace. However, its protections have not successfully been extended to an individual's appearance at work.³⁸² As employment lawyer Keith Clouse noted, "[p]hysical appearance (including body art and tattoos) is simply not a protected category and thus can generally be controlled by an employer's policies without being considered workplace discrimination."³⁸³ Clouse did, however, recognize that cities such as Washington DC, Santa Cruz, Madison, and Urbana have enacted local statutes that prohibit discrimination in the workplace based on physical appearance.³⁸⁴ While physical appearance is not directly protected under Title VII, Clouse noted that "the line becomes blurred . . . when workplace appearance and dress code policies interfere with . . ." categories explicitly protected by Title VII.³⁸⁵ Courts may find the policies violate the Civil Rights Act if physical appearance standards in the workplace have a disparate impact on a class protected under Title VII.³⁸⁶

Some tattooed employees have brought Title VII claims against their employers alleging that they discriminate against them based on their religion.³⁸⁷ Stephen Allred, an employment lawyer, noted that with respect to the race and sex discrimination claims and employee-related tattoos, some cases "show[] that tattoos may be cited as indicative of a frame of mind or bias"³⁸⁸ However, the courts still require a showing of underlying motive.³⁸⁹

381. Civil Rights Act of 1964, 42 U.S.C. § 2000e-2(a)(1) (1964).

382. Keith Clouse, *Why Workplace "Tattoo Discrimination" Is (Generally) Legal*, SUBMIT MY PR (Dec. 14, 2017, 11:43 AM), https://newsroom.submitmypressrelease.com/2017/12/14/why-workplace-tattoo-discrimination-is-generally-legal_10986.html [<https://perma.cc/GRA6-SJ49>].

383. *Id.*

384. *Id.*

385. *Id.*

386. *Id.*

387. See Allred, *supra* note 362, at 479-81 (discussing four cases for which employees brought Title VII religion cases against their employers for requiring them to cover tattoos and piercings and one case where an employee alleged his supervisor created a hostile work environment after learning about the employee's religion because of his tattoo).

388. *Id.* at 482.

389. *Id.*

VI. CONCLUSION

The use of tattoos by law enforcement for identification purposes is not novel. Law enforcement has been using these markings to help identify suspects and victims and advance investigations for quite some time. As the popularity of tattoos has increased, researchers have begun focusing on these biometric identifiers as another tool to help solve crimes.

Like facial recognition and other biometric technologies, images of tattoos provide another valuable avenue to identify suspects and victims. While still in its infancy stage of development, TRT has been labeled an “emerging field in biometrics.”³⁹⁰ As research and programs like NIST’s continue to develop, one can expect these programs and technologies will become more common. At this time, the extent that TRT can and will be used remains unclear. However, as seen with NIST’s Tatt-C, Tatt-E, and Tatt-BP, these tattoo recognition programs will be met with legal and ethical resistance.

Challenges to the research methods and practices are likely to continue as this tattoo technology is refined and deployed. The Constitution, federal and state laws, and court decisions provide tattooed individuals with ample avenues to challenge identification technologies in court. Will these challenges derail or slow down technological advances with tattoo recognition software as a crime-solving tool? That chapter has not yet been written.

390. Bacchini & Lorusso, *supra* note 109.