

LEGAL AND ETHICAL ISSUES ARISING FROM THE APPLICATION OF DATA ANALYTICS AND ARTIFICIAL INTELLIGENCE TO TRADITIONAL SPORTS

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In 2002, the Oakland Athletics' front office took a leap of faith . . . or rather the exact opposite. It went against the tide and challenged the well-established system of baseball scouting, by relying on data-analytics in decision-making. It pioneered a cross-discipline movement aimed at the further integration of data analytics and artificial intelligence ("AI") into sports.

This research dives into the legal, regulatory, and ethical concerns that arise from this data revolution in the world of sports. It focuses on the disciplines of traditional sports, excluding the novel industry of e-sports (or competitive video-gaming), which would entail a further analysis into a different regulatory system. It also adopts a non-exhaustive approach into the potential risks raised by tech's integration into sports, accepting that new challenges can emerge as developments continue in the field. The research sheds the spotlight on data-oriented topics, whether in terms of the technologies relied upon or the legal challenges encountered. It proceeds by clarifying the technical functioning of the relevant technologies, for a clearer understanding of the respective regulatory implications that are subsequently analyzed. The essay mainly focuses on the E.U. and U.S. frameworks (both on a sports and regulatory level), often relying on practical applications and short case studies.

Several considerations can be derived from the research conducted.

- The use of wearable devices and the AI-powered processing of players' metrics can be deployed for purposes ranging from performance enhancement to team-wide decision-making (in scouting, recruiting, and coaching). But this competitive*

* LL.M. (Bocconi University, 2021)

advantage comes at a cost, and sports organizations must consider the legal implications—in terms of data protection, cybersecurity, intellectual property, labor and contracting matters.

- *Integrating emerging technologies into stadium premises, instead, can revolutionize the sporting experience. By enabling the optimization of broadcasting methods, customization of advertising to consumer preferences, and tailoring of sponsorship packages to organizations' needs, AI systems are transforming the sporting entertainment landscape. This implies a complete reevaluation of the sponsorship model, along with the accompanying data-protection concerns. Indeed, the enhanced involvement of fans in the sporting experience requires an increased processing of their personal data, which can often come clashing with the regulations in place. This is reinforced by the controversial use of facial recognition methods — which can be highly intrusive with regards to privacy (and biometric data processing), but also quite useful in identifying dangerous individuals on stadium premises.*

- *The application of data analytics and AI-powered means extends to other disciplines that require specific, reinforced regulation. One instance is the deployment of these techniques by Sports Governing Bodies in the exercise of their authoritative powers. This can encompass adjudication by sports federations, but also the support of anti-doping initiatives led by organizations such as the World Anti-Doping Agency. Once again, the integration of intrusive, innovative measures can threaten the protection of sensitive data. But the implementation of data analytics does not only affect the sports industry in itself — it also leaves its footprint on sports betting, a rather controversial industry. Indeed, the legal and ethical challenges that are intrinsically present in sports gambling are further strengthened by the integration of tech into this contended framework.*

It can thus be concluded that a careful legal analysis is required to find a proper equilibrium between the benefits of the sports/technology mix and the regulatory risks it entails. This assessment should account for the specificity of the sports system, its international dimension implicating several jurisdictions, and the ever-evolving trait of technology.

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I. INTRODUCTION

“Economics and baseball. You’re funny Pete.”¹ In the movie *Moneyball*,² based on real events, this is the initial reaction of the Oakland Athletics’ general manager, Billy Beane, upon discovering the application of data science to sports.³ He would soon collaborate with Paul DePodesta, or Peter Brand in the case of the movie, to pioneer the combination of data analytics and sports.⁴ They would leverage saber metrics, which is the empirical analysis of baseball statistics, to come up with an innovative approach to scouting and coaching—leading the Oakland Athletics to a record twenty-game winning streak in the 2002 season, despite significant budget constraints.⁵ Prior to the *Moneyball* phenomenon, baseball had once been responsible for the first appearance of data analytics in sports, with the recording of the first box score in the 1870s.⁶ Yet, the more recent revolution—which this essay will tackle—is the integration of state-of-the-art data mining and machine learning techniques into sports.⁷

Indeed, it is not uncommon for sports teams to pursue trophies by investing in expensive contracts.⁸ In the past, these expensive contracts have been reserved for athletes and coaches, however, today teams have been increasingly offering them to data experts.⁹ For example, a recent addition to football club Manchester City FC is former astrophysicist and HM Treasury Policy Adviser, Laurie Shaw. The goal of these data analytics

¹ MONEYBALL (Columbia Pictures 2011).

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ Robert Skorochocki, “*Moneyball*” Review: Does It Work?, BLEACHER REP. (Jan. 28, 2009), <https://bleacherreport.com/articles/116510-moneyball-review-does-it-work>.

⁶ Mike Pesca, *The Man Who Made Baseball’s Box Score A Hit*, NPR (July 30, 2009, 12:02 AM), <https://npr.org/templates/story/story.php?storyId=106891539>.

⁷ See Hristo Novatchkov & Arnold Baca, *Artificial Intelligence in Sports on the Example of Weight Training*, J. SPORTS SCI. MED. 12, 27-37 (2013); see also Joao Gustavo Claudino et al., *Current Approaches to the Use of Artificial Intelligence for Injury Risk Assessment and Performance Prediction in Team Sports: A Systematic Review*, 5 SPORTS MED. – OPEN (2019), <https://sports-medicine-open.springeropen.com/track/pdf/10.1186/s40798-019-0202-3.pdf>.

⁸ See Fred Bowen, *Are Pro Athletes Overpaid?*, THE N.Y. TIMES UPFRONT (Apr. 1, 2019), <https://www.washoeschools.net/cms/lib/NV01912265/Centricity/Domain/1104/Are%20Pro%20Athletes%20Overpaid.pdf>.

⁹ Justin Harper, *Data Experts Are Becoming Football’s Best Signings*, BBC NEWS (Mar. 5, 2021), <https://bbc.com/news/business-56164159>.

teams is to leverage information about player performance and opposing teams in the hopes of increasing the club's chances at victory.¹⁰ Another key moment in the field was Arsenal F.C.'s 2012 deal with performance-analytics firm StatDNA (which Arsenal's manager at the time, Arsène Wenger, tried to sign to exclusivity) as part of an effort to create a movement in football similar to that of baseball.¹¹

Sports stakeholders resort to emerging technologies, including connected devices and venues, to achieve various business and athletic goals such as, the monitoring and enhancement of results, performance, talent scouting, fan involvement, etc.¹² This is possible thanks to the significant quantity of data available for processing in the realm of sports.¹³ For example, approximately 15 million datasets will be produced in the usual ninety-minute football match.¹⁴ But it is often said that “with big data and big money come big legal issues.”¹⁵ Indeed, developments in technology, such as predictive analytics and automated decision-making, can generate increased risk and legal issues.¹⁶

This essay will discuss the regulatory challenges that arise when data analytics and artificial intelligence are deployed in sports. It will focus on *traditional* sports as opposed to the emerging e-sports—the discipline of competitive gaming that raises its own fair share of legal challenges.¹⁷ For the sake of completeness, it should be noted that the continuous technological advancements in sports also give rise to transformations in the media rights framework, however, this

¹⁰ Harper, *supra* note 9.

¹¹ David Hytner, *Arsenal's 'Secret' Signing: Club Buys £2m Revolutionary Data Company*, THE GUARDIAN (Oct. 17, 2014), <https://theguardian.com/football/2014/oct/17/arsenal-place-trust-arsene-wenger-army-statdna-data-analysts>.

¹² See Michael Proman, *The Future of Sports Tech: Here's Where Investors are Placing Their Bets*, TECHCRUNCH (Oct. 1, 2019, 4:00 PM), <https://techcrunch.com/2019/10/01/the-future-of-sports-tech-heres-where-investors-are-placing-their-bets>.

¹³ Andy Nolan & Lauren Steele, *Sports Technology and the GDPR: Data Privacy Concerns in Sports Analysis*, LEXOLOGY (June 24, 2020), <https://lexology.com/library/detail.aspx?g=38355c57-547b-4e76-b575-e600d9519d2a>.

¹⁴ *Id.*

¹⁵ *See id.*

¹⁶ *See id.*

¹⁷ *See generally* Jas Purewal & Isabel Davies, *The eSports Explosion*, 9 LANDSLIDE (2016) https://americanbar.org/groups/intellectual_property_law/publications/landslide/2016-17/november-december/esports-explosion-legal-challenges-opportunities (discussing myriad of legal issues arising from e-sports).

research will focus on data-oriented matters. For each of the topics discussed, the dissertation will lay the groundwork for a technical understanding of the technologies at hand and their application to sports, then will proceed into the legal implications of such integration. This essay will proceed according to the domain in which data analytics and artificial intelligence are applied: first, in decision-making linked to strategy and tactics (*e.g.*, through performance-tracking devices); second, in the transformation of the sporting experience (*e.g.*, through connected venues and facial recognition); and lastly, in highly regulated fields (*e.g.*, adjudication, anti-doping initiatives, and sports betting).

Technical Framework:

Before diving into the core of the subject, which will explore the technical aspects of each relevant technology, it is crucial to have a prior understanding of three main principles:

- Data analytics is the science of analyzing raw data, that may be collected from past events, to draw insights and identify trends, with the aim of improving informed decision-making.¹⁸ This principle can be applied to any industry and organization, including sports, to infer data-driven conclusions from the various types of encompassed analytics: descriptive, diagnostic, predictive, and prescriptive.¹⁹ The complex field of data analytics increasingly relies on the integration of automated techniques into mechanical processes, specialist software, and algorithms.²⁰
- AI has been a topic of discussion since the works of Alan Turing. In *Computing Machinery and Intelligence*,²¹ he proposed the question, “[c]an machines think?,”²² along with a test, known as the Turing test, to distinguish between machine and human answers.²³ Since then AI has continued to evolve, reaching what the European Union (“EU”) Commission defines as “systems that display intelligent behavior by analyzing their environment and taking actions—with some degree of

¹⁸ Jake Frankenfield, *Data Analytics*, INVESTOPEDIA (June 27, 2022), <https://investopedia.com/terms/d/data-analytics.asp>.

¹⁹ *Id.*

²⁰ *Id.*

²¹ A. M. Turing, *Computing Machinery and Intelligence*, 49 MIND 433, 460 (1950).

²² *Id.*

²³ *Id.* at 454–54.

autonomy—to achieve specific goals.”²⁴

- Machine Learning (“ML”) can be considered as a branch or application of AI.²⁵ In 1959, AI-pioneer Arthur Samuel defined ML as “the field of study that gives computers the ability to learn without explicitly being programmed,”²⁶ which is a definition that has been confirmed despite significant improvements in the technology.²⁷ Indeed, the approach adopted by ML is that of “letting computers learn to program themselves through experience,”²⁸ by adapting to the inputted data without the need for human intervention.²⁹ As such, the built-in computer program gradually improves its accuracy and updates along with its environment.³⁰

When studying the legal impact of deploying these technologies into the realm of sports, it is equally important to set a basis for the appreciation of the sports system’s characteristics:

- Its international dimension entails the necessity to comply with different levels of regulations (e.g., international rules and various national ones).³¹
- Its specificity implies the need for additional, specific rules—recognized as crucial for the application of EU law to the sport system. This is codified into Article 165 of the Treaty on the Functioning of the European Union (“TFEU”).³²

Thus, the resulting sports law is a mix of regulations combining both, ordinary law that encompasses several different fields of the law and sports rules, through self-regulation from entities like Sports Governing Bodies (“SGBs”).³³

²⁴ *Communication from the Commission to the European Parliament Concerning Artificial Intelligence for Europe*, at 1, COM (2018) 237 final (Apr. 25, 2018).

²⁵ *Id.* at 4, 7.

²⁶ Mariette Awad & Rahul Khanna, *Efficient Learning Machines*, SPRINGER LINK (Apr. 27, 2015), https://doi.org/10.1007/978-1-4302-5990-9_1.

²⁷ *Id.*

²⁸ Sarah Brown, *Machine Learning, Explained*, MIT MGMT. SLOAN SCH. (Apr. 21, 2021), <https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained>.

²⁹ *Id.*

³⁰ Jake Frankenfield & Amilcar Chavarria, *Machine Learning*, INVESTOPEDIA (Jan. 16, 2022), <https://investopedia.com/terms/m/machine-learning.asp>.

³¹ Consolidated Version of the Treaty on the Functioning of the European Union art. 165, Sept. 5, 2008, 2008 O.J. (C 115) 120-21, http://data.europa.eu/eli/treaty/tfeu_2008/art_165/oj.

³² *Id.*

³³ *See generally* IAN S. BLACKSHAW, INTERNATIONAL SPORTS LAW: AN INTRODUCTORY GUIDE 1–149 (T.M.C. Asser Press, 2017) (providing an overview

Relying on the above framework as a starting-point, this essay can proceed into an analysis of the legal considerations that arise at the intersection of data-oriented technologies and traditional sports.³⁴

II. DATA ANALYTICS AND AI FOR STRATEGIC OR TACTICAL DECISION-MAKING IN SPORTS

A. Technologies Relevant to Strategic and Tactical Decision-Making

1. Wearable Technologies and Performance Data

The use of wearable technology, which generates individual data that can be aggregated to derive insight on teams and leagues,³⁵ has been increasingly widespread in a myriad of sports, including European football, tennis, the four major American leagues of professional sports (*i.e.*, the National Football League (“NFL”), National Basketball Association (“NBA”), National Hockey League (“NHL”), and Major League Baseball (“MLB”)), and even collegiate sports teams.³⁶ The wearable technology in question encompasses monitoring devices used for fitness, health purposes, and injury prevention via data-enabled medical analysis, as well as personal action cameras aimed at documenting sports and capturing performances.³⁷ A notable instance is the 2017 NFL Players Association (“NFLPA”) partnership with fitness tracker manufacturer, WHOOP,³⁸ a landmark deal allowing players to fully access, own, and commercialize their performance and health data.³⁹ The NBA has

of international sports law and its governing principles).

³⁴ See BLACKSHAW, *supra* note 33.

³⁵ WHOOP Strikes Landmark Deal as the Officially Licensed Recovery Wearable of the NFL Players Association, NFLPA (Apr. 24, 2017), <https://nflpa.com/partners/posts/whoop-strikes-landmark-deal-as-the-officially-licensed-recovery-wearable-of-the-nfl-players-association>.

³⁶ W. Scott Kim & Peter A. Nelson, *Wearable Technology Fits into Professional Sports*, DATA SEC. L. BLOG (May 14, 2018), <https://www.pbwt.com/data-security-law-blog/wearable-technology-fits-into-professional-sports>.

³⁷ Joe Lemire, *In Plain Sight: Optical Tracking of Player Performance, Game Action Fueling the Businesses of Broadcasting, Sports Betting and Training*, SPORTTECHIE (Feb. 15, 2022), <https://sporttechie.com/in-plain-sight-optical-tracking-of-player-performance-game-action-fueling-the-businesses-of-broadcasting-sports-betting-and-training>.

³⁸ NFLPA, *supra* note 35.

³⁹ *Id.*

also established similar partnerships with other providers of data tracking and analytic services, including partnerships with: (i) Second Spectrum, which provides player and ball optical tracking systems to be used by players, coaches, fans, and broadcasters; and (ii) Sportsradar US, which provides data integrity, collection, analytic, and dissemination services to be used by sports leagues, sports betting bookmakers, and media companies around the globe.⁴⁰

The methods of collecting data in sports are numerous, and in the analytics revolution player movement tracking data is definitely gaining ground.⁴¹ Optical and sensor-based player tracking locates players' positions on the field with respect to the ball and to all other players—capturing data on every event of the game.⁴² The use of tracking devices, such as radio-frequency identification (“RFID”) chips embedded in NFL players' equipment, can provide coaches with valuable insights on scouting and game strategy analysis because RFID chips generate a wide range of data for each play of every player, such as location, speed and velocity variations, ball flight path, and so on.⁴³

Smaller clubs resort to more accessible alternatives in line with their budget, such as off-the-shelf software based on video footage and ball-related data for players' shots, passes, and turnovers.⁴⁴ Teams that can afford it resort to advanced and personalized tools, aimed at analyzing defensive stability, pitch control, off-ball scoring opportunities, and specific domains.⁴⁵ More generally, algorithms can be used to detect patterns in

⁴⁰ Douglas N. Masters, *How Technology Is Improving The Fan Experience – And Creating Legal Challenges For Clubs And Leagues*, LAWINSPORT (Feb. 22, 2019), <https://lawinsport.com/topics/item/how-technology-is-improving-the-fan-experience-and-creating-legal-challenges-for-clubs-and-leagues>.

⁴¹ *Wearable Devices in Sports Market – Growth, Trends, COVID-19 Impact, and Forecasts (2022-2027)*, MORDOR INTEL., <https://mordorintelligence.com/industry-reports/wearable-devices-in-sports-market> (last updated Aug. 2022).

⁴² Lemire, *supra* note 37.

⁴³ Drew Pringle, *How the NFL's On-Player RFID Tags are Quietly Revolutionizing Football*, DIGIT. TRENDS (Feb. 6, 2021), <https://digitaltrends.com/outdoors/zebra-nfl-rfid-next-gen-stats>.

⁴⁴ *How Video Analysis Software Creates Tomorrow's Leading Sports Clubs*, SPORTS PROMEDIA (Feb. 5, 2019), <https://sportspromedia.com/categories/technology/emerging-technology/how-video-analysis-software-creates-tomorrows-leading-sports-clubs>.

⁴⁵ *See id.* (discussing the use of advanced sports video recording and analysis using specialized software).

games, or scout talent among players and coaches.⁴⁶ Wearable devices are an increasingly useful element of training, as they allow teams to manage the fitness of players by providing metrics for player workload and fatigue.⁴⁷ Biometric data of athletes, as well as physiological measurements, ensure the optimization of training protocols while respecting the health of individuals.⁴⁸ Another commonly-measured metric is Expected Goals (“xG”) which evaluates the quality of shots at both the individual and group-wide level.⁴⁹ Ever since Premier League teams have been resorting to xG, which demonstrates a low productivity in long-range shots, the average distance of a shot has been decreasing in each season of the league.⁵⁰

This processing of players’ personal data is accompanied by several legal issues controlled by various regulatory tools,⁵¹ ranging from media rights agreements that are signed by sports organizations and their media partners,⁵² to collective bargaining agreements that are signed by players associations and sports leagues.⁵³

2. AI-Powered Technologies in Scouting, Recruitment, and Coaching

AI-powered systems can also be deployed for purposes linked to tactical decision-making, ranging from coaching to player scouting and recruitment.⁵⁴

Several examples provide quite a good picture.⁵⁵ SkillCorner’s

⁴⁶ Jonathan J. Shaw, *Artificial Intelligence: The New Driving Force Behind Sports Performance and Entertainment*, LEWIS SILKIN (Feb. 13, 2019), <https://lewissilkin.com/en/insights/artificial-intelligence-the-new-driving-force-behind-sports-performance-and-entertainment>.

⁴⁷ *Id.*

⁴⁸ Barbara Osborne & Jennie L. Cunningham, *Legal and Ethical Implications of Athlete’s Biometric Data Collection in Professional Sport*, 28 MARQ. SPORTS L. REV. 37, 45 (2017).

⁴⁹ See Johnny Whitmore, *What Are Expected Goals (xG)?*, THE ANALYST (July 24, 2021), <https://theanalyst.com/na/2021/07/what-are-expected-goals-xg/>.

⁵⁰ Mark Carey, *How Shot Locations Have Changed in The Premier League*, THE ATHLETIC (Feb. 24, 2022), <https://theathletic.com/3145563/2022/02/24/how-shot-locations-have-changed-in-the-premier-league>.

⁵¹ Masters, *supra* note 40.

⁵² *Id.*

⁵³ *Id.*

⁵⁴ Shaw, *supra* note 46.

⁵⁵ See, e.g., Andrew Cohen, *Liverpool F.C. Partners With SkillCorner’s AI Platform to Extract Data From Matches*, SPORTTECHIE (Oct. 19, 2019), <https://sporttechie.com/liverpool-fc-skillcorner-ai-platform-soccer-data-sports->

AI systems are leveraged by Liverpool FC to trace the location of the ball and players, giving coaches a clear understanding of the team's on-field weaknesses.⁵⁶ Another algorithm is being developed through a collaboration between SciSports and researchers at Katholieke Universiteit Leuven ("KU Leuven") that would enable the AI system to assess a player's total impact on the game, providing football coaches with metrics for a thorough analysis of player strengths and weaknesses—which can be used to create individualized, player-specific training programs.⁵⁷ In competitive automobile racing, stress monitoring systems, such as BioRICS, are aimed at enhancing driving performance by notifying decision-makers when it is time to change racecar drivers.⁵⁸

When used in sports, these technologies can also provide teams with new methods of coaching.⁵⁹ For example, the AI system developed by the University of Southampton analyzes numerous teamwork metrics in football with the aim of overall team optimization.⁶⁰ By studying player combinations by providing metrics for their teamwork contributions and weighting the most essential teamwork metrics, the system lets coaches identify optimal team line-ups and select the recruits which would best fit their team.⁶¹

AI-powered technologies can rely on historical data, which is abundant in sports, to estimate a player's potential performance ceiling and their market value.⁶² This information can improve decision-making in talent acquisition and, specifically, investing decisions related to ideal player contract structures and optimal design of recruit offers. A player's performance can be quantified with objective metrics, interpreted as indicators of potential success, and fit with a team.⁶³ Much like their ancestor in the

tech; Jan De Bruyne & Michael Fierens, *Towards a New Research Line on Artificial Intelligence and Sports at CiTiP: General Overview*, CiTiP BLOG (June 18, 2020), <https://law.kuleuven.be/citip/blog/towards-a-new-research-line-on-artificial-intelligence-and-sports-at-citip-general-overview>.

⁵⁶ Cohen, *supra* note 55.

⁵⁷ De Bruyne & Fierens, *supra* note 55.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² Hasan Selman, *AI & Big Data Are Changing the Sports for Good*, DATAONOMY (Apr. 28, 2022), <https://dataconomy.com/2022/04/artificial-intelligence-in-sports>.

⁶³ *Id.*

Moneyball phenomenon, these technologies are increasingly used in baseball and football.⁶⁴ As for Sportlogiq's AI-system, it enables scouts in ice hockey to identify new talent that would have otherwise been difficult to spot.⁶⁵ Indeed, scouting assessments take into consideration numerous performance metrics that range from obvious ones, like home runs, passes, and goals, to more complex statistics accounting for multiple player performance factors.⁶⁶ Accurate recording, measuring, and assessment of the latter are usually difficult for humans due to perceptual limitations—a process rendered easier through the use of AI.⁶⁷

Leagues are also leveraging data-driven innovations in the hopes of gaining a competitive edge in football, by improving on-pitch performances and operations and providing fans with an enhanced version of products and experience.⁶⁸ A crucial example is that of the *Lega Serie A* and its collaboration with Math & Sport, leading to the 2019 launch of the Football Virtual Coach.⁶⁹ The Football Virtual Coach is a data-analytics software, installed on a tablet and provided to each team in the league.⁷⁰ It extracts significant data from ML video-tracking automatized algorithms and processes it in a fast, automated, and efficient manner; and through AI, it generates strategic insights, aiding decision-makers.⁷¹ This bolsters coaches' expertise by allowing them to seek optimal tactics, including offsetting the opposing team's tactics.⁷² Indeed, this method can be applied to all three phases of a sports competition: before, during, and after thanks to real-time data-processing and statistical analysis and suggestions to optimize performance.⁷³ The customization possibilities offered by

⁶⁴ Selman, *supra* note 62.

⁶⁵ De Bruyne & Fierens, *supra* note 55.

⁶⁶ Zachary D. Rymer, *The Evolution of the Scouting Process in Major League Baseball*, BLEACHER REPORT (May 29, 2013), <https://bleacherreport.com/articles/1655613-the-evolution-of-the-scouting>.

⁶⁷ Selman, *supra* note 62.

⁶⁸ See *supra* notes 36–49 and accompanying text; see also *supra* notes 54–63 and accompanying text; notes 68–73 *infra* and accompanying text; see generally Masters, *supra* note 40 (discussing the role of technology to improve the fan experience to attract new followers and retain current fans).

⁶⁹ *Lega Serie A Launches a Data-Driven Innovation Initiative to Enhance the Game of Football in Italy*, N3XT SPORTS (Feb. 26, 2021), <https://n3xtsports.com/lega-seriea-launches-data-drive-initiative>.

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

Football Virtual Coach allow coaches to receive relevant data that would best serve their strategic interests, which has drastically improved each team's real-time analysis capabilities.⁷⁴

*B. Legal Implications of Such Technologies Based on
Performance-Data*

1. Data Protection and Cybersecurity Concerns

- *Data protection and the GDPR:*

Wearable technology is evolving at a fast pace and enabling the collection of athlete data ranging from heart rate, hydration level, glucose level, and breath rate to pace, distance, injury, and weariness.⁷⁵ Underlying this information, and upon its aggregation, more sensitive data can appear linked to an athlete's identity, location, or health status.⁷⁶ The boom of the wearable technology industry is transforming the sports landscape in terms of training, performance, and fan engagement, and creating uncharted legal territory leading to regulatory issues that challenge the existing legal framework, which are yet to be resolved.⁷⁷ It is accompanied by a myriad of potential perks, but also by considerable concerns in terms of data privacy and security.⁷⁸ Privacy risks and the concomitant compliance obligations are faced by different actors, such as athletic organizations at all levels, upon their collection and processing of athletes' personal data.⁷⁹ These compliance duties—including the implementation of an up-to-date data protection plan—are critical for risk management.⁸⁰ They are set out by the law, which seeks to fill the existing gap between the regulatory framework on one side, and technology, cybercrime, and public awareness on privacy matters the other side.⁸¹ Athletic organizations should dedicate care and attention to tackling the

⁷⁴ N3XT SPORTS, *supra* note 69.

⁷⁵ Joseph J. Lazzarotti et al., *As Wearable Technology Booms, Sports and Athletic Organizations At All Levels Face Privacy Concerns*, JACKSONLEWIS: WORKPLACE PRIV., DATA MGMT. & SEC. REP. (Apr. 5, 2019), <https://workplaceprivacyreport.com/2019/04/articles/health-information-technology/as-wearable-technology-booms-sports-and-athletic-organizations-at-all-levels-face-privacy-concerns>.

⁷⁶ *Id.*

⁷⁷ *See id.*

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

regulatory risks that arise from the processing of athletes' data through wearable device programs and AI systems: indeed, the latter generates concerns of privacy and security to which a variety of data protection legislation may apply.⁸²

The use of AI systems in performance analysis and monitoring entails the collection and processing of athletes' personal data and that data's analysis through different means, thus requiring several considerations regarding data protection.⁸³ An increasing number of laws have emerged to regulate these matters, for instance, in the EU it is necessary to comply with the provisions of the General Data Protection Regulation ("GDPR"),⁸⁴ which came into effect in May 2018 and sets forth rules regarding the processing and sharing of personal data for the protection of natural persons.⁸⁵ It also sets out severe remedies in the case of non-compliance.⁸⁶ Applying the GDPR to the AI context encompasses all phases of AI, from the development of the AI model and its training with personal data to its implementation for data analytics and decision-making; a tricky task that gives rise to several issues, notably in sports-related fields.⁸⁷ Several challenges lie in applying the GDPR's six fundamental principles⁸⁸ during the development and use of AI systems in sports. They are set forth as follows:

- Regarding the accuracy principle, personal data is required to be accurate and up to date to be of sufficient quality to avoid biases in the AI's output and to prevent inaccurate decisions concerning performance.⁸⁹ But when the AI system measures player performance through historical data of past records and events it should also account for the impact caused by specific conditions on the player's performance, such as a particular coach, work environment, or personal difficulties.⁹⁰
- Moreover, the principle of data minimization requires the

⁸² Lazzarotti et al., *supra* note 75.

⁸³ *Id.*

⁸⁴ Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance), 2016 O.J. (L 119) 679 [hereinafter GDPR].

⁸⁵ *Id.* at 1.

⁸⁶ *See id.* at 80–83.

⁸⁷ De Bruyne & Fierens, *supra* note 55.

⁸⁸ GDPR, *supra* note 84, at 35–36.

⁸⁹ De Bruyne & Fierens, *supra* note 55.

⁹⁰ *Id.*

adequacy of personal data, its relevance, and its storage to be limited to what is ‘necessary’ for data processing purposes.⁹¹ This principle comes crashing with the huge amounts of data needed to train and develop the AI models.⁹² It also implies that an athlete’s personal data should be deleted upon their retirement or transfer.⁹³

- Furthermore, processing an athlete’s data must be lawful, fair, and transparent. Transparency sets forth information obligations to ensure compliance with the right to be informed (including Arts. 12-14).⁹⁴ With automated decision-making⁹⁵ this implies the disclosure of meaningful information on the logic and decision-making process of AI systems to athletes, so they can understand why a particular decision was reached—a rather controversial issue.⁹⁶ Other rights of athletes encompass, among other things, the right to access all personal data held with a one-month limit for the holder of the information to deal with the request.⁹⁷

Personal data processing also requires a valid lawful basis.⁹⁸ This can be done by establishing consent, for example, through an athlete’s contract,⁹⁹ or in the absence of such a clause, by showing that the processing of the athlete’s personal data is either “necessary for the performance of the contract”¹⁰⁰ or in their “legitimate interests.”¹⁰¹

But for many of the above-mentioned purposes related to improving tactical decision-making and monitoring athletes’ fitness and fatigue, the data inputs utilized by these AI systems consist of a “special category” of data under the GDPR (*i.e.*, health, genetic, and biometric data),¹⁰² which is unlawful to process unless, *inter alia*, the data subject provides their “explicit” consent to the processing of their data.¹⁰³ Consent refers

⁹¹ De Bruyne & Fierens, *supra* note 55.

⁹² GDPR, *supra* note 84, at 35.

⁹³ *Id.*

⁹⁴ *Id.* at 7.

⁹⁵ *See id.* at 46.

⁹⁶ *Id.*

⁹⁷ *Id.* at 11.

⁹⁸ *Id.* at 36.

⁹⁹ *Id.* at 13.

¹⁰⁰ *Id.*

¹⁰¹ *Id.* at 21.

¹⁰² *Id.* at 38.

¹⁰³ *Id.* (Article 9.2 of the GDPR sets forth other exceptions for when this “special category” of data may be processed).

to “any freely given, specific, informed and unambiguous indication of the data subject’s wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her”¹⁰⁴ and such explicit consent needs to be stated clearly.¹⁰⁵ Some issues could arise in the context of “freely-given” consent when a power imbalance in employment relationships may push some athletes to sacrifice data protection at the benefit of better contract terms or enhanced performance metrics.¹⁰⁶ This issue of unintentional peer pressure has also been recognized by the European Data Protection Board in its 2019 Guidelines when it provided that “[w]here a sports club takes the initiative to monitor a whole team . . . consent will often not be valid, as the individual athletes may feel pressured into giving consent so that their refusal of consent does not adversely affect teammates.”¹⁰⁷

Consequently, it is sometimes claimed that consent should be avoided as a basis for processing an athlete’s health data through AI systems, with alternative grounds favored—especially in instances of consent withdrawal.¹⁰⁸ This can happen with anti-doping agencies when processing athletes’ data by using forbidden products and withdrawing their consent. Here, alternative grounds could include: (1) the exercise of obligations and rights in the employment law context, thanks to national rules enabling data processing for anti-doping aims; (2) the assessment of someone’s “working capacity”, provided it is conducted by an individual subject to the responsibility of maintaining professional secrecy; or (3) the protection of the data subject’s vital interests, like cardiovascular risk assessments. It is worth noting that modifying the legal basis—especially from consent—further down the line is forbidden without good reason.

Additionally, when the risk resulting from some data processing activity which affects rights and freedoms of individuals is likely to be high, a data protection impact

¹⁰⁴ GDPR, *supra* note 84, at 34.

¹⁰⁵ *Id.* at 6.

¹⁰⁶ *Id.*

¹⁰⁷ Andy Nolan, *Sports Technology and the GDPR: Data Privacy Concerns in Sports Analysis*, BRODIES: OUR INSIGHTS (June 24, 2020), <https://brodies.com/insights/media-broadcasting-and-sports/sports-technology-and-the-gdpr-data-privacy-concerns-in-sports-analysis>.

¹⁰⁸ Melanie Forcier et al., *Integrating Artificial Intelligence into Health Care Through Data Access: Can the GDPR Act as a Beacon for Policymakers?* 6 J. L. BIOSCI. 317, 327 (2019).

assessment (“DPIA”) must be implemented by the organization processing the data.¹⁰⁹ This requirement applies particularly to certain circumstances, such as the large-scale processing of special data categories, or even to some processing involving novel technology or novel applications thereof, as with AI systems.¹¹⁰

Additional provisions for profiling and automated decision-making are crucial to AI system assessments to provide players with information about these AI systems and to conduct regular maintenance checks of these systems. Article 22 of the GDPR stipulates an athlete’s “right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her.”¹¹¹ This applies to decision-making processes that have significant effects (a blurry area) and are entirely, “solely” automated—leaving no room for substantial, active human involvement impacting the outcome.¹¹² In the context of automated decision-making in sports, the interaction between AI models and human influence from coaches, analysts, or medical staff thus raises compelling questions: to what degree has AI impacted the final decision of these individuals?¹¹³ This is especially relevant because of automation bias as people, including coaches, tend to excessively trust AI system outputs without challenging their accuracy.¹¹⁴

The GDPR’s prohibition on automated decision-making allows for certain exceptions, such as an athlete’s explicit consent or the protection of their rights, freedoms, and legitimate interests through the establishment of appropriate safeguards.¹¹⁵ The particular case of children – and thus of young athletes – is detailed in Recital 71 of the GDPR and in the WP29 Guidelines: the latter recommends to avoid using the Article 22.2 exceptions to support the processing of children’s personal data.¹¹⁶

¹⁰⁹ GDPR, *supra* note 84, at 53.

¹¹⁰ *Id.*

¹¹¹ *Id.* at 46.

¹¹² *Id.*

¹¹³ *Id.*

¹¹⁴ See Kaveh Waddell, *In AI We Trust—Too Much*, AXIOS (Oct. 19, 2019), <https://axios.com/2019/10/19/ai-automation-bias-trust>.

¹¹⁵ GDPR, *supra* note 84, at 46.

¹¹⁶ See generally *id.* at 7, 15; Jan De Bruyne & Michael Fierens, *Towards a New Research Line on Artificial Intelligence and Sports at CiTiP: Some Preliminary Legal and Ethical Issues*, CiTiP BLOG (June 23, 2020), <https://law.kuleuven.be/citip/blog/towards-a-new-research-line-on-artificial->

Exceptional circumstances allowing for the processing of this data include the protection of young players' welfare.¹¹⁷ But this can only be valid in the presence of explicit consent—the age varies across member states, leading to opinion discrepancies on guardian consent requirements.¹¹⁸

Illegally gathering sensitive data can have high financial damage, with penalties amounting to a maximum of €20 million.¹¹⁹ To minimize these risks, teams should put in place the appropriate safeguards of data protection—especially data anonymization and encryption—to shelter players' personal information from any breaches, which would have significant repercussions on a team, both in terms of reputation and finances.¹²⁰ If the organization acts solely as a data controller delegating to a third-party data processor, additional issues should be considered including third-country transfers, for instance: does the national law of the country in which the processor operates offer the appropriate legal protection for players and their data?¹²¹

Data-Economy: between privacy and confidentiality, data ownership and use:

Issues arising from processing athletes' data collected through wearable technology can relate to privacy and confidentiality, the ownership, use, and sharing of the collected data, including both an individual athlete's information and aggregated data of teams and leagues.¹²² Who is accountable for the secure storage,

intelligence-and-sports-at-citip-some-preliminary-legal-and-ethical-issues [hereinafter De Bruyne & Fierens 2].

¹¹⁷ *Guidelines on Automated Individual Decision-Making and Profiling for the Purposes of Regulation 2016/679*, EURO. COMM'N: NEWSROOM, at 26 (Aug. 22, 2018), <https://ec.europa.eu/newsroom/article29/redirection/document/49826>.

¹¹⁸ *Consent to Use Data on Children*, E.U. AGENCY FOR FUNDAMENTAL RTS. (Apr. 24, 2018), <https://fra.europa.eu/en/publication/2017/mapping-minimum-age-requirements-concerning-rights-child-eu/consent-use-data-children>.

¹¹⁹ GDPR, *supra* note 84, at 82–83.

¹²⁰ See generally Bob Hohler, *Players Rip MLL After Data Breach Exposes Private Information*, BOSTON GLOBE (Aug. 29, 2017, 7:32 PM), <https://bostonglobe.com/sports/2017/08/29/players-rip-ml-ml-after-data-breach-exposes-private-information/jfc9huGZa2PQxtpBHRJEEK/story.html> (describing an accidental data breach that potentially exposed the confidential information of more than 1,000 players).

¹²¹ See generally GDPR, *supra* note 84, at 62 (explaining that Article 46 is transferred subject to appropriate safeguards which include that of third-country transfers).

¹²² Brian R. Socolow & Ieuan Jolly, *Game-Changing Wearable Devices that Collect Athlete Data Raise Data Ownership Issues*, WORLD SPORTS ADVOC., July 2017, at 15, 16, (available at <https://loeb.com/-/media/files/publications/2017/07/>

protection, and rightful use of the data? Who owns the athletes' data generated from various sources, such as wearable technologies and movement data, medical, fitness, and drug test information, and injury treatments? With the involvement of several stakeholders, such as teams, athletes, and AI developers in the data processing, some of these questions remain unanswered.¹²³

In many aspects, the concerns regarding professional athletes' data gathered by teams and leagues mirror the concerns regarding personal employee data gathered by any employer.¹²⁴ The ownership of a player's data depends on who collects it; usually, the leagues and teams gathering the data own at least the raw data inputs and any aggregation or analysis they engage in with that data.¹²⁵ How can leagues and teams make sanctioned use of the data is another issue: to what extent can athletes' personal data be used before their privacy rights are violated? Can players have reasonable expectations of confidentiality in their personal data, including those collected by teams or leagues? Other questions are particular to professional sports and extend beyond the traditional employer-employee relationship in data collection.¹²⁶ Taking the example of analytical data regarding individual athletes: can it be used in video games or disclosed, with or without confidentiality protections, to sports analysts, commentators, broadcast partners, and participants in fantasy sports? The NFL seems to answer positively to all the parts of this question, while recognizing the need to be cautious when sharing the information in terms of data types, quantities, and recipients due to the numerous possibilities of dividing the collected data in smaller

gamechanging-wearable-devices-that-collect-athlete.pdf).

¹²³ De Bruyne & Fierens, *supra* note 55; see Tom Worville, *Inside De Bruyne's Data Report: Sancho Comparison and Impact of Playmaker's Possible City Exit Crucial to New Deal*, THE ATHLETIC (Apr. 12, 2021), <https://theathletic.com/2509349/2021/04/12/inside-de-bruyne-data-report-sancho-comparison-and-impact-of-playmakers-possible-city-exit-crucial-to-new-deal>.

¹²⁴ Karin Kashi, *Collecting Employee Information? It's Time to Wake Up*, JD SUPRA (Jan. 12, 2021), <https://jdsupra.com/legalnews/collecting-employee-information-it-s-6974458>.

¹²⁵ Heather Zeiger, *The Ethics of Tracking Athlete's Biometric Data*, MED. L. Xpress (Jan. 18, 2017), <https://medicalxpress.com/news/2017-01-ethics-tracking-athletes-biometric.html>.

¹²⁶ Compare Kashi, *supra* note 124, at 1, with Julia Powles et al., *Getting Ahead of the Game: Athlete Data in Professional Sport*, AUSTRAL. ACAD. SCI. 1, 19 (2022), <https://science.org.au/files/userfiles/support/reports-and-plans/2022/getting-ahead-of-the-game-athlete-data-in-professional-sport.pdf>.

sets, and the many other potential applications, such as the enhancement of intelligence possessed by their opponents.¹²⁷

The significant amount of detailed information processed by professional teams and leagues leads to an increased risk of data breaches—whether by accidental leaks or intentional hacks—as such information could be targeted by stalkers and hackers, inadequately handled by employers, claimed by insurers, or even subjected to discovery in litigation.¹²⁸ In the context of sports in the U.S., it remains unsettled which regulatory scheme would protect against these risks threatening the data generated from wearable fitness devices because: (1) the scope of protected information covered by the Health Insurance Portability and Accountability Act (“HIPAA”)¹²⁹ does not include this particular type of data; (2) the lack of regulation on the Internet of Things (“IoT”) persists despite the Federal Trade Commission’s (“FTC”) novel endeavors; and (3) it is unclear which cybersecurity laws would provide effective protection.¹³⁰

Cybersecurity:

As AI systems are gaining ground in the field of sports, implementing suitable cybersecurity is becoming more and more urgent due to the risks emanating from the lack thereof or from a hacked platform.¹³¹ Hacked scouting platforms can also profoundly impact the competition, as athletes’ personal and health statistics risk becoming public, such as when Manchester City’s Scout7 scouting system was supposedly hacked by its competitor, Liverpool, in 2013, and ended in a £1 million settlement.¹³² Higher cyberattack risks are also due to a particular phenomenon, as clubs are increasingly relying on

¹²⁷ Bernard Marr, *How The NFL Is Using Big Data*, FORBES (Oct. 6, 2015, 2:22 AM), <https://forbes.com/sites/bernardmarr/2015/10/06/how-the-nfl-is-using-big-data>.

¹²⁸ Anthony Studnicka, *The Emergence of Wearable Technology and the Legal Implications for Athletes, Teams, Leagues, and Other Sports Organizations Across Amateur and Professional Athletics*, 16 DEPAUL J. SPORTS L. & CONTEMP. PROBS. 195, 210 (2020).

¹²⁹ Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191, 110 Stat. 1936 (1996).

¹³⁰ Barbara Osborne & Jennie L. Cunningham, *Legal and Ethical Implications of Athletes’ Biometric Data Collection in Professional Sport*, 28 MARQ. SPORTS L. REV. 37, 47–49 (2017).

¹³¹ Studnicka, *supra* note 128.

¹³² Steve McCaskill, *Liverpool and Man City ‘Scout Hack Settlement’ Epitomizes a Modern Soccer Rivalry*, FORBES (Sept. 27, 2019, 10:19 AM), <https://forbes.com/sites/stevemccaskill/2019/09/27/liverpool-and-man-city-scout-hack-settlement-epitomizes-a-modern-soccer-rivalry>.

performance monitoring through the deployment of IoT including wearable technology, which along with their cloud platforms, often present weaknesses in security.¹³³ To counter these effects, EU-wide cybersecurity certification schemes for information and communication technology (“ICT”) have recently been introduced by the new Cybersecurity Act.¹³⁴ As for IoT device manufacturers, there would already be the possibility to comply with basic requirement standards, such as the European Telecommunication Standards Institute European Standards (“ETSI EN”) 303 and 645, or to acquire the Eurosmart IoT Certification¹³⁵ under the relevant scheme.¹³⁶

Sporting Regulations

As sports law encompasses both ordinary law and self-regulation through sports rules, leagues and SGBs have delivered regulations on the deployment of wearable technology.¹³⁷ Two notable instances are:

- Schedule 3 of the World Rugby Handbook, which provides for several binding requirements applying to the availing of “player monitoring devices”.¹³⁸ Setting out these standards aims at promoting athlete welfare and minimizing injury risk “without seeking to compromise the form or appeal of the game.”¹³⁹
- FIFA rules, which condition the use of electronic performance and tracking systems (“EPTS”) in official competition matches on some specifications: the EPTS must

¹³³ Melinda L. McLellan et al., *Wearables in Sports*, 35 ENT. SPORTS L. 3, 4–5 (2019); see also *What is IoT? IoT Basics for Your Business*, TELENOR IoT (2021), <https://iot.telenor.com/iot-insights/what-is-iot-security/#>.

¹³⁴ Commission Regulation 2019/881 of Apr. 17, 2019, on ENISA (the European Union Agency for Cybersecurity) and on Information and Communications Technology Cybersecurity Certification and Repealing Regulation (EU) No 526/2013 (Cybersecurity Act), 2019 O.J. (L151) 15, 15.

¹³⁵ *Eurosmart IoT Certification Scheme*, EUROSMT, <https://eurosmart.com/eurosmart-iot-certification-scheme> (last visited Sept. 20, 2022).

¹³⁶ *Id.*; *ETSI EN 303 645 Cybersecurity Standard for Consumer IoT Devices*, INTERTEK, <https://intertek.com/cybersecurity/etsi-en-303-645/#:~:text=ETSI%20EN%20303%20645%20is,mandatory%20requirements%20and%2035%20recommendations> (last visited Sept. 20, 2022).

¹³⁷ Ani Ghazikhanian & Sean Cottrell, *A Comparison of Sports Regulations on the Use of Wearable Technology & Data Collection*, LAWINSPO (Feb. 9, 2018), <https://lawinsport.com/topics/item/a-comparison-of-sports-regulations-on-the-use-of-wearable-technology-data-collection>.

¹³⁸ *PMD Specification*, WORLD RUGBY, <https://www.world.rugby/the-game/facilities-equipment/equipment/specifications/pmds> (last visited Sept. 20, 2022).

¹³⁹ Shaw, *supra* note 46.

comprise certain badges and be free of danger, and the data transmitted from it are prohibited to circulate or be processed in the area of a live match.¹⁴⁰

New technologies are increasingly being used in football for the collection of athletes' well-being data and performance metrics.¹⁴¹ The changes in the data collection landscape of professional football not only concern the increase in the amount of data gathered, but also the reinforced sensitive character of personal data—namely, data linked to athletes' health and performance.¹⁴² Having recognized the needs emerging from this trend, FIFA and FIFPro have collaborated for the development of a data protection framework governing the management of personal player performance data in relation to FIFA competitions.¹⁴³ This framework sets out active measures and best practices rooted in the GDPR and the Swiss legal system.¹⁴⁴ The framework stipulates a standard for the processing of athletes' personal data, with safeguards aiming to prevent missteps leading to the violation of personal and privacy rights and a charter providing for a list of athletes' rights to be applied in accordance with the GDPR.¹⁴⁵

2. Intellectual Property and Labor Concerns

Intellectual Property Issues:

Intellectual Property ("IP") matters are relevant at the intersection of performance metrics and other technologies.¹⁴⁶ Personal information also refers to the likeness and image of individuals.¹⁴⁷ Similar to other fields, in the world of sports, and

¹⁴⁰ *Electronic Performance and Tracking Systems (EPTS)*, FIFA, <https://fifa.com/technical/football-technology/standards/epts> (last visited Oct. 15, 2022).

¹⁴¹ See, e.g., *id.* (highlighting the use of technology as a mechanism to track data and performance metrics).

¹⁴² *FIFA and FIFPRO Develop Standards on Management of Personal Player Performance Data*, FIFA (June 28, 2022), <https://football-technology.fifa.com/en/media-tiles/fifa-and-fifpro-develop-standards-on-management-of-personal-player-performance-data>.

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ See *Name, Image, Likeness, And Interplay With Intellectual Property*, JD SUPRA (July 8, 2021), <https://jdsupra.com/legalnews/name-image-likeness-and-interplay-with-5098268/>.

¹⁴⁷ See *id.* ("Common examples of [name, image, and likeness] in the professional sports space include the usage of an athlete's name on a jersey for sale, an athlete making an appearance on a commercial or advertisement,

especially with the continuous rise of social media and tech deployments, organizations and individuals have to be careful about protecting their IP and publicity rights, which are both significant sources of revenue.¹⁴⁸ Related lawsuits have been on the rise, and the following are two of the main recent ones.¹⁴⁹ When fantasy football companies, Draft Kings and FanDuel, made unlicensed uses of the names, likenesses, and statistics of former University of Illinois players, those players filed a lawsuit for infringement.¹⁵⁰ However, it was found that under the Illinois publicity rights statute college athletes' information was deemed newsworthy, and thus the companies were allowed to use the information.¹⁵¹ In contrast, when Electronic Arts Inc. ("E.A.") used the likeness of retired NFL players without permission in its Madden NFL video game, the athletes filed an action against the company for infringement of publicity rights under California law.¹⁵² The U.S. Supreme Court, by refusing to consider the case, upheld the Ninth Circuit ruling that E.A. could not avoid the class action by relying on the First Amendment.¹⁵³

Another issue affects wearable technology companies seeking to protect their investment and IP—namely, their patents and trade secrets.¹⁵⁴ Indeed, a surge in litigation can be observed: Jawbone, for instance, has filed separate actions against Fitbit

and a computer-generated image of an athlete appearing in a video game."); see also Laura Lee Stapleton & Matt McMurphy, *The Professional Athlete's Right of Publicity*, 10 MARQ. SPORTS L. J. 23, 24 (1999) ("The right of publicity protects athletes' and celebrities' marketable identities from commercial misappropriation by recognizing their right to control and profit from the use of their names and nicknames, likenesses, portraits, performances (under certain circumstances), biographical facts, symbolic representations, or anything else that evokes this marketable identity . . . any trait that uniquely identifies celebrities or athletes implicates their marketable identities and should therefore be protected.") (citing Pamela Edwards, *What's the Score?: Does the Right of Publicity Protect Professional Sports Leagues?*, ALB. L. REV., 579, 581 (1998)).

¹⁴⁸ See *Intellectual Property of Professional Athletes*, SCHNEIDER & ONOFRY (May 2, 2021), <https://soarizonalaw.com/blog/intellectual-property-of-professional-athletes-4>; see also Stapleton & McMurphy, *supra* note 147, at 24 (explaining that the main reason an athlete may profit off of the commercial value of his name and likeness is due to of the right of publicity).

¹⁴⁹ See notes 148-51 *infra* and accompanying text (elaborating upon two recent cases related to intellectual property in sporting matters).

¹⁵⁰ *Daniels, et al. v. FanDuel Inc.*, 909 F.3d 876, 877 (7th Cir. 2018).

¹⁵¹ *Id.* at 878.

¹⁵² *Davis, et al. v. Electronic Arts, Inc.*, 775 F.3d 1172, 1181 (9th Cir. 2015).

¹⁵³ See *Electronic Arts, Inc. v. Davis, et al.*, 577 U.S. 1215 (2016) (cert. denied).

¹⁵⁴ See *infra* notes 153-58 and accompanying text.

for trade secret theft and infringement of patents including one for “a wellness application using data from a data-capable band.”¹⁵⁵ Jawbone also filed a petition to the U.S. International Trade Commission (“ITC”), seeking an investigation into six alleged patent infringements by Fitbit.¹⁵⁶ Another notable lawsuit is that of Savint Technologies, which sued several defendants, including Adidas, for patent infringement over various products including the Adidas miCoach training shirt.¹⁵⁷ Similar litigation will likely continue to increase.¹⁵⁸ Litigation concerning technology firms collaborating with professional sports teams could negatively affect the rate at which wearable technology evolves and is integrated into organizations’ activities.¹⁵⁹

Labor Concerns:

Contract and salary negotiations have always been based on available metrics used to predict performance.¹⁶⁰ Historically, these statistics have been limited to measurable past performance, age, basic health data, and past injuries.¹⁶¹ With the current growth of data availability, analytics are now capable of uncovering previously undetectable information that could be used in contract negotiations, for instance, if the data were to reveal predictable declines in the performance of peaking athletes.¹⁶² This previously-unknown data can range from biometric data or minute changes in athletic capacities to metrics predicting long-term health or future injury inclinations.¹⁶³ The matter of adopting data tracked by wearable technology in contract negotiations has been raised by the NBA Players Association (“NBPA”), which founded its argument by citing team reports.¹⁶⁴

¹⁵⁵ Brian Socolow, *Wearable Tech Will Change Pro Sports – And Sports Law*, LAW360 (Sept. 17, 2015, 10:21 AM) <https://www.law360.com/articles/701415/wearable-tech-will-change-pro-sports-and-sports-law>.

¹⁵⁶ See Alaina Lancaster, *Prosecutors Drop Remaining Charges in Jawbone-Fitbit Trade Secret Fight*, THE RECORDER (Feb. 14, 2021, 6:37 PM), <https://law.com/therecorder/2020/02/14/prosecutors-drop-remaining-charges-in-jawbone-fitbit-trade-secret-fight/?slreturn=20210830165716>.

¹⁵⁷ Socolow, *supra* note 155.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ *Id.*

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.*

The NFL authorizes teams to leverage chip data while negotiating contracts, and it is within a team's discretion whether to grant players full access to their data.¹⁶⁵ Here, it is crucial to note the ongoing debate regarding the true owner of this data. Athletes want to be informed about the data storage location and conditions, processing and disclosure capabilities, access authorizations and protection safeguards, which are all concerns that were tackled in the 2017–2021 Collective Bargaining Agreement (“CBA”) of the MLB and the MLB Players Association,¹⁶⁶ which is specifically addressed in Attachment 56. Such CBAs and player contracts should deal with the question of athlete data derived through wearable technology that is collected by teams and leagues, such as what can be done with the data, who can access each kind of data, whether players or their representatives are entitled to their data, etc.

Contract Lifecycle:

AI has the potential to prove useful at each stage of a contract's lifecycle.¹⁶⁷ The NFL uses a system to provide teams with insights on players' salaries and whether they are unjustifiably high.¹⁶⁸ Players' data, including outputs of AI-powered technologies, can be leveraged in player contracts; for example, to push for more favorable terms and salary during contract negotiations, or instead in contract termination when actual performance may diverge too far from performance predictions.¹⁶⁹

This can give rise to several concerns regarding the use of automatic, AI-driven decision-making in employment relationships.¹⁷⁰ To address these regulatory challenges, the NBA published a collective labor agreement prohibiting the use of data collected by wearable technology in contract negotiations in

¹⁶⁵ See Kevin Seifert, *NFL Players Grab a Data Equalizer in Era of Wearable Technology*, ESPN (Apr. 24, 2017), https://espn.com/blog/nflnation/post/_id/235806/nfl-players-grab-a-data-equalizer-in-era-of-wearable-technology; Libby Plumber, *NFL Players Will Soon Be Able to Sell Their Own Fitness Data*, WIRED (Apr. 26, 2017, 9:00 AM), <https://wired.co.uk/article/nfl-players-sell-data>.

¹⁶⁶ See MLB, Collective Bargaining Agreement 2017-2021, MLB PLAYERS (2017), https://www.mlbplayers.com/_files/ugd/b0a4c2_95883690627349e0a5203f61b93715b5.pdf.

¹⁶⁷ See Stefan Grundmann & Philipp Hacker, *Digital Technology as a Challenge to European Contract Law*, 13 EUROPEAN L. REV. OF CONT. L. 225, 276-86 (2017).

¹⁶⁸ See Eddie Moran, *Now Evaluating NFL Contracts? AI*, FRONT OFFICE SPORTS, (Jul. 29, 2019, 11:55 AM) <https://frontofficesports.com/ai-evaluating-nfl-player-contracts>.

¹⁶⁹ See De Bruyne & Fierens, *supra* note 55.

¹⁷⁰ See *id.*

2017.¹⁷¹ When already-existing norms suffice to tackle similar concerns, they often have to be adjusted or even entirely reevaluated and redesigned to adapt to the current landscape.¹⁷²

Another area of sports contracting in which AI can prove effective is assistance with player drafting and team management.¹⁷³ It can help account for all the interests of the various stakeholders (e.g., teams, managers, and sponsors) by drafting initial contract clauses to minimize the likelihood of triggering litigation or a prolonged negotiation process, and pinpoint invalid or unfair clauses.¹⁷⁴

Contract negotiation - Focus on the NHL and on Pierre-Alexandre Parenteau:

A discipline in which these advanced analytics methods have undoubtedly been relevant for contract negotiation over the past decade is demonstrated by professional ice hockey.¹⁷⁵ In the summer between the 2013-2014 season, many NHL teams resorted to the capabilities of data experts in their player scouting and recruitment process.¹⁷⁶ This led up to the league's formal recognition of enhanced statistics in February 2015, during which the NHL also made public a partnership with the company, SAP, to manage their website's enhanced statistics.¹⁷⁷ Several enhanced metrics can have huge impacts on contract negotiation.¹⁷⁸

Like many other organizations, the NHL has instituted limitations to the evidence that can be used in salary negotiation.

¹⁷¹ NBA, *Collective Bargaining Agreement*, NBPA, <https://nbpa.com/cba> (last visited Sept. 22, 2022).

¹⁷² See, e.g., *id.* (demonstrating the reevaluation of the NBA collective bargaining agreement in relation to wearable data usage).

¹⁷³ See Stefan Grundmann & Philipp Hacker, *Digital Technology as a Challenge to European Contract Law*, 13 EUROPEAN L. REV. CONT. L. 225, 280 (2017).

¹⁷⁴ De Bruyne & Fierens 2, *supra* note 116.

¹⁷⁵ See generally Matt Larkin, *How Advanced Stats are Changing NHL Contract Negotiations*, THE HOCKEY NEWS (June 29, 2015), <https://thehockeynews.com/news/how-advanced-stats-are-changing-nhl-contract-negotiations>.

¹⁷⁶ *Id.*

¹⁷⁷ NHL, *SAP Partnership to Lead to Statistical Revolution*, NHL (Feb. 20, 2015), <https://nhl.com/news/nhl-sap-partnership-to-lead-statistical-revolution/c-754184>.

¹⁷⁸ See Ryan Lake, *Why Enhanced Statistics are a Game Changer for NHL Contract Negotiations*, LAWINSPORT (Sept. 29, 2015), <https://lawinsport.com/topics/item/why-enhanced-statistics-are-a-game-changer-for-nhl-contract-negotiations>.

The NHL's January 2013 CBA, which was signed by the NHL and the NHL Players Association ("NHLPA"), includes a section that lists the statistics that are admissible in the process of "salary arbitration,"¹⁷⁹ which occurs when players, agents, and the team owning a player's rights cannot agree on the terms of the contract—provided certain requirements are met.¹⁸⁰ During the arbitration process, both sides usually quantify the player's impact for the team via objective metrics.¹⁸¹ Since the NHL's 2015 formal recognition of enhanced statistics, these metrics have become admissible in salary arbitration, which increases their relevance in contract negotiations, and can be particularly useful for players with better performance results in less traditional statistics.¹⁸²

The impact of such enhanced metrics in contract negotiations is well illustrated by the instance of a one-year, \$1.5 million contract signed by Pierre-Alexandre Parenteau—on the very first day of free agency—whose traditional statistics in the 2014-2015 season were lower than expected (sometimes due to injuries) with the Toronto Maple Leafs—a team coincidentally at the leading edge of the enhanced statistics revolution.¹⁸³ A claim could be made that the Maple Leafs managed to sign an impact player at a price significantly lower than his expected market value.¹⁸⁴ This raises the question of how a player's market value is determined. The factors considered are complex and multi-sided, and common factors of comparison are crucial in setting a benchmark with respect to other players around the league.¹⁸⁵ Both traditional and enhanced metrics can be used to support the claim of a player's market value.¹⁸⁶ Enhanced statistics could have been leveraged by Parenteau to leverage contract negotiations in his favor to obtain better terms.¹⁸⁷

The following two are measures of (individual-based or team-based) puck possession in ice hockey, relying on the proven metric of shot attempts during a game: (1) Corsi For Percentage

¹⁷⁹ See *Collective Bargaining Agreement*, NHLPA (2012), <https://nhlpa.com/the-pa/cba>.

¹⁸⁰ See *id.*

¹⁸¹ See Lake, *supra* note 178.

¹⁸² *Id.* at 5–7.

¹⁸³ *Id.*

¹⁸⁴ *Id.*

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

¹⁸⁷ *Id.*

("CF%"), where the metric aggregates shots on goal, shots blocked, and shots missed; and (2) Fenwick For Percentage ("FF%"), where blocked shots is not encompassed in the metric because blocking shots is considered a measurable skill.¹⁸⁸ Indeed, studying the FF% metric against the CF% metric offers considerable insight into the effectiveness of a team or player at blocking shots.¹⁸⁹ Benchmarked to a previously determined pool of comparable players, a player can display further strengths or weaknesses through the use of these advanced metrics.¹⁹⁰ For instance, Parenteau had strong possession numbers for that 2014-2015 season, as evidenced by both his CF% and FF% when benchmarked against comparable players.¹⁹¹ These values demonstrate that during the 2014-2015 season, Parenteau's team was in possession of the puck for a majority of the time while he was in-play on the ice.¹⁹²

This example relies on just two of numerous statistics relevant to a player's performance in ice hockey, but it provides an overview of the disrupting technical means available in contract negotiation.¹⁹³ In this instance, factors that need to be accounted for are whether Parenteau had a reason for accepting this below-market offer, or whether he was really undervalued in his contract with the Maple Leafs having all the required baggage in enhanced statistics to recognize such a player for his true value.¹⁹⁴

The advanced analytics revolution, initiated in 1964 by Earnshaw Cook, promises to fundamentally transform the way players are evaluated and thus empowers players to negotiate more favorable contract terms with their teams, their sponsorship, and in their endorsement deals.¹⁹⁵ It also has the potential to enhance fan experiences across countries and disciplines.¹⁹⁶ The movement to begin tracking enhanced analytics in sports that first began in the MLB—now cemented

¹⁸⁸ See Evan Sporer, *Primer: Get to know new enhanced stats on NHL.com*, NHL INSIDER (Feb. 20, 2015), <https://nhl.com/news/primer-get-to-know-new-enhanced-stats-on-nhl-com/c-754260>.

¹⁸⁹ See Lake, *supra* note 178.

¹⁹⁰ See Sporer, *supra* note 188.

¹⁹¹ *Id.*

¹⁹² *Id.*

¹⁹³ *Id.*

¹⁹⁴ *Id.*

¹⁹⁵ *Id.*

¹⁹⁶ *Id.*

as a crucial element in the MLB contract negotiation and salary arbitration process—was recently adopted by the NHL and NFL, which can be expected to give rise to more legal issues surrounding storing, processing, and sharing players' data.¹⁹⁷

The legal unknowns concerning wearable technology, whether in professional sports or the purely consumer context, are abundant.¹⁹⁸ With specific regulations governing wearable technology remaining scarce and litigation surrounding this technology on the rise, existing areas of the law in the fields of labor, privacy, and IP will likely be impacted by the continued emergence of these technologies.¹⁹⁹ But if professional sports teams persist in their use of wearable technology despite the legal uncertainties, it is due to the benefits these technologies offer from the enhancement of fan engagement and experience to the improvement of athletic performance, and the protection of players' health, for instance, through injury prevention.²⁰⁰

III. INTEGRATION OF TECHNOLOGY INTO THE OVERALL SPORTING AND STADIUM EXPERIENCE

A. Connected Venues and AI Revolutionizing the Sporting Experience

1. Technology in Sporting Entertainment: Implications on Sponsorship

Leagues also invest in data analytics and rely on AI-generated insights to analyze potential changes in the league's rules and to create new content.²⁰¹ Providing supporters with facts and statistics—whether about the past or immediate present of the organization—enables leagues to reinforce the connection

¹⁹⁷ See Lake, *supra* note 178.

¹⁹⁸ See Mary Costigan et. al., *As Wearable Technology Booms, Sports and Athletic Organizations At All Levels Face Privacy Concerns*, JD SUPRA (Apr. 5, 2019), <https://jdsupra.com/legalnews/as-wearable-technology-booms-sports-and-97565>.

¹⁹⁹ See *id.*

²⁰⁰ See Tony Luczak et. al., *State-of-the-Art Review of Athletic Wearable Technology: What 113 Strength and Conditioning Coaches and Athletic Trainers from the USA Said About Technology in Sports*, 15 INT. J. SPORTS SCI. & COACHING 26, 26 (2020).

²⁰¹ See David Jarvis & Kevin Wescott, *The hyperquantified athlete: Technology, measurement, and the business of sports*, DELOITTE (Dec. 7, 2020), <https://www.deloitte.com/x/en/insights/industry/technology/technology-media-and-telecom-predictions/2021/athlete-data-analytics.html>.

between both, fans and their teams and fans and the leagues.²⁰² A collaboration between the National Collegiate Athletic Association (“NCAA”) and Google Cloud has enabled the establishment of detailed databases, facilitating the search and analysis of data for all stakeholders involved, from organizations, leagues, and teams alike.²⁰³ The NBA, like many other leagues, has implemented a digital platform aimed at sharing curated written and visual content, such as tweets, articles, photos, and videos so that its media partners can publish the content via traditional or social media platforms.²⁰⁴

AI also has the potential to transform the sporting entertainment landscape to the advantage of many stakeholders:

- The media can rely on game play video from significantly more cameras and camera angles, with the aim of providing better broadcasts to fans.²⁰⁵ Thanks to the NBA’s aforementioned partnership with Second Spectrum, broadcasters (such as the Entertainment and Sports Programming Network (“ESPN”) and ESPN’s Full Court Press digital broadcasting) can provide NBA fans with four viewing modes to choose from: Player mode, Mascot mode, Coach mode, or another option of analysis broadcasting.²⁰⁶ Broadcasters can refine video content by analyzing the insights drawn from the collection of bigger, much larger masses of raw data.²⁰⁷ Thanks to AI technologies relying on deep-learning models, media companies and broadcasters can optimize the production process of live events through the automation of tasks and analysis, and the creation of audiovisual content such as replays, highlights, and captivating collections of camera angles that are able to be disseminated in real-time.²⁰⁸ For

²⁰² Jarvis & Wescott, *supra* note 201.

²⁰³ See *Google Cloud Named Official Cloud of the NCAA*, NCAA (Dec. 19, 2017), <https://www.ncaa.com/news/ncaa/article/2017-12-19/google-cloud-named-official-cloud-ncaa>.

²⁰⁴ See *NBA and Broadband TV Launch Groundbreaking Multi-Platform Network: NBA Playmakers*, NAT’L BASKETBALL ASS’N, (May 17, 2016), <https://pr.nba.com/nba-broadbandtv-playmakers>.

²⁰⁵ See *id.*

²⁰⁶ See 21ST CENTURY SPORTS: HOW TECHNOLOGIES WILL CHANGE SPORTS IN THE DIGITAL AGE (Sacha L. Schmidt ed., Springer Int’l Publ’g 2020).

²⁰⁷ See Bogdan Batrinca & Philip C. Treleaven, *Social Media Analytics: A Survey of Techniques, Tools and Platforms*, 30 A.I. SOCIETY 89, 116 (2015).

²⁰⁸ See *A Developer’s Guide to Video Machine Learning & Video Deep Learning*, RIDGERUN, <https://ridgerun.com/video-based-ai> (last visited Sept. 22, 2022).

example, the IBM Watson supercomputer and its use at the Wimbledon tournament illustrates how emerging technologies can benefit broadcasters—because IBM Watson’s AI system has the ability to extract peak moments from the matches by screening through videotapes and identifying the moments with the highest emotional responses from the athletes and the crowd.²⁰⁹

- Rights-holders and advertisers can use AI and advanced ML algorithms to better serve consumers by presenting them with innovative and individually tailored services based on consumer’s own preferences and their consumption behavior.²¹⁰ Personalized content, such as consumer-customized advertisements, allows media companies to effectively engage with a wide variety of consumers in a single digital space.²¹¹

Sponsors are given new methods through which they can gather data regarding their campaigns and estimate the return on their video marketing investments by relying on brand-tracking, AI-powered technologies such as vBrand and IDenTV.²¹² By leveraging smart functions, ranging from automated speech recognition to textual semantic classifiers and computer vision, image recognition technology can gather a myriad of data on sponsorship campaigns, whether in the form of qualitative metrics, like the quality of exposure, or quantitative statistics, such as the number and duration of a brand’s display over a season’s worth of media exposure through all distribution channels.²¹³

Legal Issues Linked to Data Analytics and Sponsorship

Sport sponsorships have evolved rapidly over the past decade—most notably in the trend of growth in revenue (e.g., the global sports sponsorship market reached a size of 57 billion USD in 2020),²¹⁴ and brand usage of data-oriented technology to reach a

²⁰⁹ See *IBM Reveals New AI and Cloud Powered Fan Experiences for Wimbledon 2022*, IBM (June 21, 2022), https://newsroom.ibm.com/2022-06-21-IBM-Reveals-New-AI-and-Cloud-Powered-Fan-Experiences-for-Wimbledon-2022?mhsrc=ibmsearch_a&mhq=wimbledon.

²¹⁰ See *id.*

²¹¹ See *Personalized Ads: A Guide to Personalization Without Cookies*, IBM WATSON ADVERT. (June 22, 2021), <https://ibm.com/watson-advertising/thought-leadership/personalized-ads-guide-without-cookies>.

²¹² See Shaw, *supra* note 46.

²¹³ See *id.*

²¹⁴ See Christina Gough, *Size of Sports Sponsorship Market Worldwide in 2021 and 2030*, STATISTA (July 18, 2022), <https://statista.com/statistics/269784/revenue-from-sports-sponsorship-worldwide-by-region/>

target demographic of technology-savvy consumers in their sponsorship activation.²¹⁵ The evolving means of capturing audience behaviors are leading to challenges for both sponsors and rights-holders.²¹⁶ Indeed, the data analytics revolution has also provided an effective basis for decision-making, thus remodeling the way brands integrate sports sponsorships into their marketing strategy: brands can resort to tailor-made sponsorship packages (in addition to the promise of sponsorships in new sectors, such as electronic sports (“e-sports”) and new social media influencer roles for athletes).²¹⁷

Clubs, as rights-holders, can no longer offer to all brands a traditional sponsorship package with a linear menu of rights and deliverables which are identical in size and price, as activation requests include numerous requirements grounded upon the results of data analytics.²¹⁸ This is necessary for the monetization of brand exposure in all possible avenues linking sports consumers to a brand, especially on digital channels.²¹⁹ All of this has transformed the legal landscape of contract negotiation when it comes to sponsorship deals.²²⁰ Ramón Amich, director of Nielsen Sports in Spain and Portugal, explained: “In the last few years brands have really become aware of what they want, what they need. That has radically changed the way they interact with clubs, stakeholders and generally with all competitions.”²²¹ With the digitalization of media and the resulting transformation of broadcasting networks, brands looking to invest in sports expect to have the ability to customize sponsorship packages depending on their specific needs, target audience, and communication strategy: brands popular amongst the younger population that are active on social media would favor deals centered around social media content over those focused on standard exposure through traditional media such as television or static advertisements in venues.²²²

²¹⁵ See *Do More With Data*, TOWARDS DATA SCI. (Sept. 5, 2019), <https://towardsdatascience.com/do-more-with-data-6bc71f6eb4b3>.

²¹⁶ See *id.*

²¹⁷ See *id.*

²¹⁸ See Ramón Amich, *The Effectiveness of Data Analytics to Measure the Return on Sport Sponsorship*, JOHAN CRUYFF INST. (May 28, 2021), <https://johancruyffinstitute.com/en/blog-en/sport-marketing/data-analytics-on-sport-sponsorship>.

²¹⁹ See *id.*

²²⁰ See *id.*

²²¹ See Amich, *supra* note 218.

²²² See *id.*

To generate active engagement with consumers and direct personalized content of marketing campaigns toward each target group on the relevant platform, sponsors need to leverage the potential value of their data, namely that accessible through the rights-holders' databases.²²³ This is evidenced by recent sponsorship deals, namely Emirates' 2012 renewal of their partnership with Arsenal, of which the catalyst is believed to be the value that could potentially be derived from the club's customer relationship management ("CRM") system.²²⁴

All of these considerations have profound implications in terms of data protection, particularly the existence of novel legal risks for both sponsors and rights-holders.²²⁵ These parties are required to dedicate significant attention to ensure compliance with their obligations under the relevant data protection legislation, for instance, the EU-wide legislative framework, GDPR, details the responsibilities of data controllers and processors and spells out potential consequences in the event of a regulation breach.²²⁶ A regulation breach would likely result in the release of personal data such as names, digital or physical addresses, and other identifying information of consumers.²²⁷

Sponsors may have the right to carry out targeted campaigns by supporting competitions in which holders of a football match ticket—having provided their data to the team when buying the ticket—enter for a chance to win a meet-and-greet with athletes in return for purchasing the sponsor's product or service.²²⁸ Communicating that promotion to customers and disclosing the use of their personal information would trigger several obligations for data controllers under the EU regulatory framework.²²⁹

Under the EU framework, entities must ensure the lawfulness, fairness, and transparency of personal data processing is in accordance with the principles set out in the GDPR.²³⁰ This

²²³ See Amich, *supra* note 218.

²²⁴ See Seb Joseph, *Emirates: 'CRM Data Key to £150m Arsenal Deal'*, MARKETINGWEEK (Nov. 23, 2012), <https://marketingweek.com/2012/11/23/emirates-crm-data-key-to-150m-arsenal-deal>.

²²⁵ See Ashleigh van Kerckhoven et al., *Big Data Analytics & Privacy: How to Resolve This Paradox*, COMPACT, <https://compact.nl/en/articles/big-data-analytics-privacy-how-to-resolve-this-paradox> (last visited Sept. 9, 2022).

²²⁶ See *id.*

²²⁷ See *id.*

²²⁸ See *id.*

²²⁹ See *id.*

²³⁰ *What is GDPR, the EU's New Data Protection Law?*, GDPR EU,

means that the processing can only occur if legal permission exists or is or enabled through the explicit consent of the data subject.²³¹ Upon collection of personal data from customers, rights-holders should obtain consent to distribute such data to reliable and well-defined third parties, including sponsors, for marketing purposes and for the optimization of the data value.²³² This transfer of personal data must be governed by a contract between the team and the sponsor, with additional conditions for compliance if the transfer involves parties operating outside the EU, all of which will often be included in the sponsorship agreement detailing the rights and responsibilities of the parties dealing with the data.²³³ Sponsors should always account for any potential legal constraints when implementing their activation strategies, especially in terms of data protection.²³⁴ When data collection is generated by a sponsor's own marketing activities such as using hyperlinks that lead consumers to submit their information directly to them, these brands act as data controllers, which requires compliance with the relevant requirements.²³⁵ In joint marketing initiatives, however, data controllers are less easy to identify, thus pushing for requirements of clearer terms and conditions when it comes to privacy: in the case of a mobile application released for a tournament but branded by a title sponsor, who is the chief operator entitled to leverage the collected information? In any case, consent must be free, specific, informed, and unambiguous, so users can modify their privacy preferences at all times and request clear explanations on the processing of their data.²³⁶

Through the myriad of new data collection means, marketing channels, and consumer engagement opportunities, the technology revolution is a direct catalyst for the threats to data protection and privacy if compliance is not ensured.²³⁷ Connected stadia are emerging, allowing sponsors to leverage wireless beacons and Bluetooth connectivity to spectators in the stands, meaning brands can send marketing messages to fans'

<https://gdpr.eu/what-is-gdpr> (last visited Aug. 29, 2022).

²³¹ See GDPR EU, *supra* note 230.

²³² GDPR, *supra* note 84, at 41.

²³³ *Id.* at 60 (Article 44 of the GDPR sets the additional conditions for compliance when the data is transferred to a party operating outside of the EU).

²³⁴ *Id.* at 15.

²³⁵ *Id.* at 15.

²³⁶ *Id.* at 6.

²³⁷ *Id.* at 2.

smartwatches during halftime with the hopes of steering them towards purchase locations inside a venue.²³⁸ Two such instances include the San Francisco 49ers Levi's Stadium²³⁹ and the Barclays Center in Brooklyn, which was revolutionized by Cisco's "Connected Sports and Entertainment Solution."²⁴⁰

It is thus evident that embracing technological developments, especially in the field of data analytics, can have a huge positive impact for both sponsors and right-holders, particularly through the optimization of commercial revenues and return on investment ("ROI"), provided they acknowledge some practical considerations.²⁴¹ Right-holders can leverage data analytics to expand their portfolio of rights, enhance their understanding of the market and their customer base; and through these valuable findings, they can accurately target and attract brands and acquire a stronger position in sponsorship contract negotiations by proposing customized rights packages.²⁴² Brands, instead, benefit from these tailored packages by allowing them to customize their marketing strategies and reach their target audiences more efficiently.²⁴³ In view of these advantages of technology, it is sometimes suggested to use language favoring adaptability when drafting legal documents and sponsorship contracts, such that both parties can reap the benefits of emerging methods and means.²⁴⁴ Such language accommodates unpredictable technological instruments for delivering a right whether analogous—such as LED perimeter advertising boards instead of static ones or mobile-like apps instead of mobile optimized websites.²⁴⁵ Brands could benefit from a first option to negotiate the allocation of new rights deriving from new

²³⁸ Tim Bjarin, *Meet Levi's Stadium, the Most High-Tech Sports Venue Yet*, TIME (Aug. 18, 2014, 11:36 AM).

²³⁹ *Interesting Facts About Levi's Stadium WIFI, Mobile App, and Ninerds*, LEVI'S STADIUM (Sept. 8, 2014), <https://www.levisstadium.com/2014/09/progress-tk-interesting-facts-levis-stadium-wifi-mobile-app-ninerds>.

²⁴⁰ *Barclays Center Utilizes Cisco to Transform Fan Experience*, BARCLAYS CNTR. (Sept. 19, 2012), <https://barclayscenter.com/news/detail/barclays-center-utilizes-cisco-to-transform-fan-experience>.

²⁴¹ See Amich, *supra* note 218.

²⁴² See *id.*

²⁴³ See Amich, *supra* note 218.

²⁴⁴ Manali Kulkarni, *Key Sponsorship Trends in the Use of Technology and Data: Part 2 – Legal Considerations*, LAWINSPORT (Sept. 28, 2016), <https://lawinsport.com/topics/features/item/key-sponsorship-trends-in-the-use-of-technology-and-data-part-2-legal-considerations>.

²⁴⁵ *Id.*

technology.²⁴⁶ Finally, going back to the data protection and privacy concerns, these can be dealt with by ensuring compliance, transparency, and clarity regarding all elements of the data processing by employing the appropriate language in sponsorship contracts and consumer-facing terms and conditions.²⁴⁷

2. Connected Venues and Fan Experience: Implications on Fan Data

Innovative technology and media, as well as the ensuing partnerships with sports organizations, are revolutionizing the fan experience and expanding opportunities for fan participation—from improvements in statistical models and applications to cutting-edge uses of virtual reality (“VR”) and augmented reality (“AR”).²⁴⁸ Various initiatives are working to promote fan engagement from different perspectives and to different extents.²⁴⁹ Beyond electronic ticketing, other innovations can be employed to enhance the fan experience by creating more widespread WiFi-enabled venues, such as:

- Extended reality technologies that can be installed in stadiums to facilitate the broadcast of content such as games in VR and highlights in both AR and VR.²⁵⁰
- Systems like BriziCam, which are used at NBA games and Grand Slam tournaments, empower fans by giving them control over venue cameras through their smartphones and allowing them to share and upload pictures to their social media accounts.²⁵¹
- MLB has partnered with a biometric identity platform, CLEAR, to identify registered supporters by their fingerprints and allow them to access venues or pay at concessions with a simple swipe or tap of their cellphone.²⁵² It is important to note that the MLB is not necessarily a pioneer in leveraging biometrics for these organizational purposes, as other institutions have been using the identification method as a

²⁴⁶ See Kulkarni, *supra* note 244.

²⁴⁷ *Id.*

²⁴⁸ Masters, *supra* note 40.

²⁴⁹ See *id.*

²⁵⁰ Masters, *supra* note 40.

²⁵¹ *Id.* (citing *CLEAR Partners with Major League Baseball & Tickets.com to Introduce Biometric Ticketing*, BUS. WIRE (July 12, 2018, 9:00 AM), <https://businesswire.com/news/home/20180712005205/en/CLEAR-Partners-with-Major-League-Baseball-Tickets.com-To-Introduce-Biometric-Ticketing>).

²⁵² *Id.*

security measure for a while.²⁵³ There has been, however, a constant shift in the regulation of biometric data processing.²⁵⁴ Live viewers watching from the stands can also profit from an enhanced experience shaped by AI: facial recognition enables to locate people and security threats, manage access to venues, facilitate purchasing processes, and so on; AI chatbots (like AS Roma's Batistuta) can assist organizers in customer service and personalized communication.²⁵⁵ Wearable technology can also be proposed to fans. Smart wristbands are offered to supporters of the football club Manchester City to serve several functions: updating them on matches; enabling payment at concession stands and event access through electronic ticketing; and locating other individuals.²⁵⁶ Other kinds of wearable devices are meant to enhance the fan experience by allowing them to feel the action: sensor-embedded Jersey X, developed by Wearable X, wirelessly picks up real-time data from players and translates it into haptic vibrations, simulating players' sensations from on-field action such as touchdowns, interceptions, and fumbles in football games.²⁵⁷

- Fan-Controlled Football League ("FCFL")²⁵⁸ is the ultimate development of fan engagement. Using drones, helmet cams, and biometrics, the FCFL mixes real-life traditional sports with the fan involvement of fantasy sports.²⁵⁹ This technology playground puts supporters at the center of the game by giving them the decision-making status of general managers regarding coach selection, player rosters, and play calling ability.²⁶⁰ In the FCFL in-game play calling is voted for by fans

²⁵³ Masters, *supra* note 40.

²⁵⁴ See Jonathan Louis Newmark et. al., *Biometrics Regulations: Navigating US Biometric Laws*, GOODWIN PRIV. BLOG (Nov. 8, 2021), <https://www.goodwinprivacyblog.com/2021/11/08/biometrics-regulations-navigating-us-biometric-laws/>.

²⁵⁵ See Alex Tuck, *How AI Platforms Are Transforming Sports Fan Engagements*, TECH. MAG. (Mar. 17, 2022), <https://technologymagazine.com/ai-and-machine-learning/how-ai-is-transforming-sports-fan-engagement> ("An AI-assisted control centre with security personnel will oversee and monitor your safety."); *Introducing Botistuta, Roma's New Facebook Messenger Chatbot*, AS ROMA (Oct. 19, 2018), <https://www.asroma.com/en/news/2018/10/introducing-botistuta-roma-s-new-facebook-messenger-chatbot>.

²⁵⁶ See Masters, *supra* note 40.

²⁵⁷ *Id.*

²⁵⁸ See *FCF*, <https://www.fcf.io> (last visited Sept. 9, 2022).

²⁵⁹ See *WTF is FCF*, *FCF*, <https://fcf.io/how-it-works> (last visited Sept. 9, 2022).

²⁶⁰ See *id.*

through Twitch or FCFL's mobile application, which is instantly communicated to the players.²⁶¹

Fan data is also processed whether directly in sports venues or through digital interactions ranging from mobile applications to social media platforms.²⁶² This can have further legal implications, as publicity and privacy rights also apply to members of sports audiences: they can file actions in courts after the fact, but so far, they do not have a say in the implementation of fan engagement initiatives that involve the processing of their personal data and they have different protections from those of traditional players.²⁶³ Two categories of fans can be identified here: (1) live audiences inside the venue, who might have waived certain rights to some extent by accepting back-of-ticket contracts; and (2) fans outside of the stadium premises, who have been able to join the audience through innovative technological and interactive means, but whose rights remain unclear.²⁶⁴ All actors in the world of sports are affected by the technology revolution, but fans might be particularly impacted: their increasing engagement is vital to the industry, yet their official collective power and protections under existing law remain scarce.²⁶⁵ This could be improved through the involvement of protection groups, whether dedicated to consumer privacy or specifically to fans' rights. The Sports Fans Coalition ("SFC")²⁶⁶ has already done so for fan rights in the area of sports betting (even developing the Sports Bettors Bill of Rights) and could extend it to privacy and monetization matters.²⁶⁷ Since the processing of supporter personal data for fan engagement purposes generates increasingly significant revenues, fans might soon demand a cut of the profits.²⁶⁸ As for organizations implementing fan engagement initiatives, they could learn from

²⁶¹ See FCF, *supra* note 259.

²⁶² See Masters, *supra* note 40.

²⁶³ See *id.*

²⁶⁴ See *id.*

²⁶⁵ See *id.*

²⁶⁶ See *Sports Fans*, SPORTS FANS COAL. (last updated June 22, 2022), <https://www.sportsfans.org>.

²⁶⁷ See *Sports Bettors' Bill of Rights*, SPORTS FANS COAL., https://www.sportsfans.org/sports_bettors_bill_of_rights (last visited Sept. 9, 2022).

²⁶⁸ See Max Wittenberg & Declan Meany, *Stadium Analytics: Increasing Sports Fan Engagement With Data and AI*, DATABRICKS (Mar. 31, 2022), <https://databricks.com/blog/2022/03/31/stadium-analytics-increasing-sports-fan-engagement-with-data-and-ai.html>.

past mistakes, such as personal data breaches with millions of data subjects and lawsuits filed by individuals for the alleged unlawful use of their image and likeness.²⁶⁹

B. Facial Recognition in Sporting Venues

1. Technical Aspects and Practical Applications

In February 2020, Italy started contemplating the implementation of facial recognition technologies in football stadiums to counter the racist chants and slurs that were multiplying in sporting venues.²⁷⁰ The goal was to identify racist supporters in real time or restrict their access to stadium premises in the case of a previous ban.²⁷¹ It was Vincenzo Spadafora, Minister for Youth Policies and Sports, who announced the government's intention to deploy "new technologies to support the work of police forces" in football stadiums all over Italy.²⁷² The CEO of Lega Serie A, Luigi De Siervo, directly referred to facial recognition tools stating: "[w]e need to get all of the people who are ruining this wonderful sport, one by one. With face recognition, this is now possible."²⁷³

Gabriele Gravina, head of the Italian Football Federation ("FIGC"), corroborated the need for the project.²⁷⁴ The plan was to pair this with the adoption of sonic radars, which are sound surveillance systems used to "spot the source of a noise":²⁷⁵ this would encompass fans' private conversations on the premises to identify racist conversations, which would raise privacy concerns as Gravina himself noted.²⁷⁶ He also explained that using both

²⁶⁹ See Daniel A. Rozansky et. al., *Protecting Image and Likeness Through Trademark Law*, 11 NAT'L L. REV. 292 (2021), <https://natlawreview.com/article/protecting-image-and-likeness-through-trademark-law>.

²⁷⁰ See Fabio Chiusi, *In Italy, an Appetite for Face Recognition in Football Stadiums*, ALGORITHM WATCH (Sept. 16, 2020), <https://algorithmwatch.org/en/italy-stadium-face-recognition>.

²⁷¹ See *id.*

²⁷² *Id.*

²⁷³ See Gravina, "Riconoscimento Facciale per Combattere il Razzismo Negli Stadi", SKY SPORT (Jan. 16, 2020, 6:38 PM), <https://sport.sky.it/calcio/serie-a/2020/01/16/gravina-figc-razzismo-intervista>.

²⁷⁴ See *id.*

²⁷⁵ See Matteo Monti, *Gabriele Gravina: "A Sound Radar to Defeat Racists at the Stadium"*, LA REPUBBLICA (Oct. 20, 2019), https://repubblica.it/sport/2019/10/20/news/gabriele_gravina_un_radar_sonoro_per_sconfiggere_i_razzisti_allo_stadio_-301066408.

²⁷⁶ *Id.*

these technologies to spot the offenders would have deep legal ramifications.²⁷⁷ The FIGC was even considering the implementation of an “objective responsibility” regime, in which clubs adopting suitable technologies would be the sole ones to benefit from a liability shield for fans’ actions.²⁷⁸ This would also prevent club extortions by “ultra” fans, who often resort to threats of racism as a method of blackmail to reach their goals.²⁷⁹

But if the pandemic pulled a break on these efforts, clubs had still managed to test the use of face recognition in stadiums, with pilot deployments in Udine and Naples.²⁸⁰ In the fall of 2019, the use of such video surveillance at Naples’ San Paolo stadium allowed security personnel to identify, locate, and fine thirty-two fans who violated the stadium’s security regulations within a single month.²⁸¹ Earlier that year, in Udine’s Stadio Friuli, the pilot integrated “Sistema Automatico di Riconoscimento Immagini (‘S.A.R.I.’), an “automated system for image recognition” created by Puglia-based Reco 3.26 and initially employed by Italian police to arrest criminals.²⁸² It has both an “ENTERPRISE” function able to recognize already-identified individuals and a “REAL TIME” function, which uses live video feeds to carry out instant facial recognition.²⁸³ Its monitoring function was tested at the stadium’s entrance to keep banned individuals out of the premises.²⁸⁴ De Siervo later implied that S.A.R.I. would be implemented as a security measure in all football stadiums across Italy.²⁸⁵ When discussing the future

²⁷⁷ See Monti, *supra* note 275.

²⁷⁸ See Matteo Pinci, *Football, the FIGC Meets Spadafora: Reforms and Racism on the Table*, LA REPUBBLICA (Sept. 25, 2019), https://repubblica.it/sport/calcio/2019/09/25/news/razzismo_federcalcio_incontro_spadafora_riconoscimento_facciale-236877315/.

²⁷⁹ See *Juventus ‘Ultras’ Arrested Over Allegations They Blackmailed Officials for Tickets*, BBC (Sept. 16, 2019), <https://bbc.com/sport/football/49712955>.

²⁸⁰ See Chiusi, *supra* note 270.

²⁸¹ See *Naples, Sector Invasion at the San Paolo: 10 Daspo and 32 Fined*, TG24SKY (Oct. 29, 2019, 4:53 PM), <https://tg24.sky.it/napoli/2019/10/29/san-paolo-napoli-daspo>.

²⁸² See Matthew Spielkamp, *Automating Society Taking Stock of Automated Decision-Making in the EU*, ALGORITHM WATCH 6, 89–90 (2019), https://algorithmwatch.org/en/wpcontent/uploads/2019/02/Automating_Society_Report_2019.pdf.

²⁸³ *Id.* at 89.

²⁸⁴ *De Siervo (Lega Calcio): Neighbors With Facial Recognition in Stadiums*, LA SICILIA (Dec. 16, 2019), <https://lasicilia.it/video/video-dalla-rete/314369/de-siervo-lega-calcio-serie-a-de-siervo-vicini-a-riconoscimento-facciale-negli-stadi.html>.

²⁸⁵ *Id.* at 42.

Milanese stadium aimed at replacing San Siro, mainstream media have even portrayed S.A.R.I as the default security method to spot banned fans as well as “potential terrorists” according to *Corriere della Sera*.²⁸⁶ That same article claims that plans shared with the municipality by both Milanese clubs include “geolocalisation and sound sensors (and) software that is able to recognize abnormal behavior, such as loitering or the sudden presence of an object in a certain place.”²⁸⁷

- Although Italy is so far the only one to have done so to combat racism, facial recognition technology has been deployed in stadiums of other countries for a variety of purposes benefiting the different actors involved.²⁸⁸ Indeed, unlike other security solutions, AI-powered security measures constitute an investment with significant ROI, generated from the crucial data that allows for informed decisions regarding practices and strategies through consumer behaviors, business analytics, and traffic patterns.²⁸⁹

- Its business value encompasses the examination of crowd demographics and the provision of data for informed decision-making in: the creation of new marketing avenues (promotions and direct advertising),²⁹⁰ the enhancement and personalization of the fan experience, and the implementation of interactive or customized features (music, activities, and involvement of the social-media focused fans).²⁹¹ The identification of individuals in crowds comes with its fair share of legal challenges in terms of privacy rights and anonymity.²⁹²

- Its tangible benefits as a security measure include the localization of a lost person, recognition of known attendees,

²⁸⁶ Maurizio Giannattasio, *New San Siro Stadium, Hi-tech Controls: Facial Identikit Up to 60 Meters*, CORRIERE DELLA SERA (Sept. 17, 2019, 9:59 AM), https://milano.corriere.it/notizie/cronaca/19_settembre_17/nuovo-stadio-san-siro-controlli-hi-tech-identikit-facciali-fino-60-metri-a45c719a-d91f-11e9-8812-2a1c8aa813a3.shtml.

²⁸⁷ *Id.*

²⁸⁸ See Chiusi, *supra* note 270, at 42.

²⁸⁹ See *Stadiums and AI in the Aftermath of Covid*, PRO. FOOTBALL J. at 6, <https://professionalfootballjournal.fifa.com/pfj2-61-stadiums-and-ai-in-the-aftermath-of-covid>, (last visited Sept. 8, 2022).

²⁹⁰ See Richard L. Brand & Eva Pulliam, *Faces In The Crowd: Legal Considerations for Use of Facial Recognition Technology at Sports Arenas*, LAWINSPORT (Apr. 28, 2020), <https://lawinsport.com/topics/item/faces-in-the-crowd-legal-considerations-for-use-of-facial-recognition-technology-at-sports-arenas>.

²⁹¹ *Id.*

²⁹² See *id.*

athletes, or celebrities, the establishment of a protocol for restricted participation or expedited entry, and the limitation of access only to cleared individuals allowed inside the facilities.²⁹³ An example of more secure and efficient ticketing and admission is the 2018 partnership established by MLB with CLEAR for the use of biometric identity platform, which enables one-tap admission and effective payment method at concession stands.²⁹⁴

- Its security-related advantages also extend to the protection of employees, guests, and athletes by locating banned fans, tracking individuals responsible for security incidents, fending off potential threats or attacks, and aiding law enforcement in the identification of known high-risk criminals.²⁹⁵ This has been implemented in Benelux. Another major instance is that of the Danish football club Brøndby IF, which implemented facial recognition to replace the printed photos previously distributed to security staff in the identification process of blacklisted guests.²⁹⁶ But these surveillance capacities constitute infringements on the civil liberties and privacy rights of attendees, especially if the correct safeguards are not put in place to avoid abuse of the technology for unlawful purposes.²⁹⁷

AI and stadiums in the midst of a pandemic: impact of the Covid-19 health emergency

With clear transparency rules still missing from the legal landscape, there have been several trials and deployments of facial recognition in stadiums.²⁹⁸ But with Covid-19 pressing pause on competitions and the necessity of face masks upon the re-opening of stadiums, how accurate could these technologies still be, and could they be updated accordingly? Solutions to these issues, which have yet to be proven efficient, rely on a combination of facial recognition with thermal scanning and

²⁹³ See Brand & Pulliam, *supra* note 290, at 43.

²⁹⁴ See Logan Huff, *MLB Partnership Could Change the Way Fans Access Stadiums*, GLOB. SPORTS MATTERS (Mar. 27, 2019), <https://globalsportmatters.com/business/2019/03/27/mlb-targets-biometric-identification-nationwide>.

²⁹⁵ See *id.*

²⁹⁶ Adam Janofsky, *Stadium Weeds Out Disruptive Fans With Facial Recognition*, THE WALL ST. J. (Sept. 5, 2019, 11:30 AM), <https://wsj.com/articles/stadium-weeds-out-disruptive-fans-with-facial-recognition-11567589403>.

²⁹⁷ See Brand & Pulliam, *supra* note 290, at 43.

²⁹⁸ See Diamond Leung, *Facial Recognition Technology Tested By LPGA, Is the NHL Up Next*, SPORTS BUS. J. (Oct. 19, 2017), <https://sporttechie.com/facial-recognition-technology-tested-lpga-nhl-next>.

other technologies used to control public health during the pandemic.²⁹⁹ A notable instance is the “Feel Safe” system, described as an “automated anti-virus gate” and tested in Turin, at a match against Hellas Verona.³⁰⁰ It is described by the Milanese company that developed it, Worldwide Exhibition System, as an “interface with a company’s entry management system, thanks to a system of biometric controls.”³⁰¹

Despite the complications of facial recognition with face masks being widespread, organizations behind AI surveillance software still claim to maintain a 96% accuracy for identifying people wearing a mask.³⁰² As for the identification of an individual not wearing a mask, it generates an alert.³⁰³ Indeed, the integration of AI in football stadiums, as recently done by leagues, clubs, and SGBs, is also believed to have huge potential in the recovery of venues in the aftermath of the Covid-19 pandemic.³⁰⁴ These security solutions are cost effective, since already available surveillance cameras often only need to be supplemented by AI surveillance software.³⁰⁵ The latter is then easily accessible by designated users on any device, thus rendering stadium operations more fluid and streamlined.³⁰⁶ According to FIFA, bringing supporters back to stadiums can be facilitated by several capacities of AI-powered technology,³⁰⁷ namely through:

- crowd scanning and metrics (“people counting”, group statistics, behavioral analytics) for precise, accurate, and immediate social distance monitoring while alerting staff of overcrowding in real time;
- track and trace due to some games being “super-spreading events”, “searchveillance”, and similar practices aimed at tracking spectators during and after matches;
- fever detection through thermal cameras; and
- the above-mentioned facial recognition to locate persons of interest.³⁰⁸

²⁹⁹ See PRO. FOOTBALL J., *supra* note 289, at 43.

³⁰⁰ See Chiusi, *supra* note 270.

³⁰¹ *Id.*

³⁰² See PRO. FOOTBALL J., *supra* note 289.

³⁰³ *Id.*

³⁰⁴ *Id.*

³⁰⁵ *Id.*

³⁰⁶ *Id.*

³⁰⁷ *Id.*

³⁰⁸ *Id.*

2. Legal Implications of Facial Recognition in Stadiums and Sports

But if the future mass implementation of AI-security and facial recognition technology in stadiums remains unknown despite its myriad of advantages, it is namely due to the accompanying legal pitfalls.³⁰⁹ Hence, before being put in place in a venue, the technology has to be examined from a business and legal point-of-view regarding its accuracy and effectiveness, requirements of appropriate notice and free consent, and security and litigation risks.³¹⁰

Although in 2016, the Italian Data Protection Authority (“DPA”) authorized the deployment of facial recognition technology in Rome’s Stadio Olimpico; the situation has evolved since then.³¹¹ The former president of the Italian DPA himself warned that “caution” should be applied when dealing with such technologies in these contexts.³¹² While the deployment of facial recognition systems might prove useful in law enforcement or to combat pressing and dangerous issues such as racism, terrorism, loitering, or losing children inside stadium premises, it raises several legal concerns closely linked to data protection and privacy.³¹³

All technologies—especially emerging ones—contain a certain degree of inaccuracy due to human error since they are developed by humans.³¹⁴ Among other flaws, technology can mirror the discriminatory biases promoted or reinforced by the inputted datasets.³¹⁵ Facial recognition, for example, often fails to differentiate between darker-skinned individuals and thus overly tracks the wrong targets, especially when it relies on criminal

³⁰⁹ See generally Taylor Kay Lively, *Facial Recognition in the United States: Privacy Concerns and Legal Developments*, ASIS INT’L (Dec. 1, 2021), <https://asisonline.org/security-management-magazine/monthly-issues/security-technology/archive/2021/december/facial-recognition-in-the-us-privacy-concerns-and-legal-developments> (discussing the legal risks associated with facial recognition technology).

³¹⁰ See *id.*

³¹¹ Chiusi, *supra* note 270.

³¹² *Id.*

³¹³ See *id.*

³¹⁴ See Charles P. Shelton, *Human Interface/Human Error*, CARNEGIE MELLON U. (1999), https://users.ece.cmu.edu/~koopman/des_s99/human.

³¹⁵ See, e.g., Steve Lohr, *Facial Recognition Is Accurate, if You’re a White Guy*, N.Y. TIMES (Feb. 9, 2018), <https://nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html> (discussing racial bias in facial recognition technologies).

databases, which have often proved to contain a bias of over-inclusion.³¹⁶ Since this discriminatory bias inherent to AI has been identified, research has launched to build a solution for the reduction and elimination of this dangerous issue.³¹⁷ Continuous care and updates must be dedicated by users of these technologies in order to track improvements and minimize the discriminatory bias.³¹⁸

Facial recognition technology also raises concerns with respect to publicity and property rights violations if an individual's picture is employed in advertising, and in more cases, with respect to privacy laws.³¹⁹ From a privacy standpoint, information related to an individual's face is considered biometric data because it is "personal data resulting from specific technical processing relating to the physical, physiological or behavioral characteristics of individuals,"³²⁰ which enables users or the data to uniquely identify individuals.³²¹ Specific laws apply to this kind of information, the processing of which entails certain requirements in terms of notice and consent.³²²

Prior to using any individual's image, it is crucial to deliver notice and obtain consent in compliance with the relevant law applicable to the given jurisdiction. Accordingly, some of the above uses are based on security reasons.³²³ The logic in the U.S. legal system would be the following: warrants may be issued for law enforcement uses, with priority often given to heightened security circumstances, like terrorism and more serious crimes;³²⁴ employment agreements should include these matters to avoid litigation for failure to notify under the Illinois Biometric

³¹⁶ See Lohr, *supra* note 315.

³¹⁷ See John Roach, *Microsoft Improves Facial Recognition Technology to Perform Well Across All Skin Tones, Genders*, MICROSOFT (June 26, 2018), <https://blogs.microsoft.com/ai/gender-skin-tone-facial-recognition-improvement>.

³¹⁸ See *id.*

³¹⁹ See United States Government Accountability Office, Report to the Ranking Member, Subcommittee on Privacy, Technology, and the Law, Committee on the Judiciary, U.S. Senate, *Facial Recognition Technology: Commercial Uses, Privacy Issues, and Applicable Federal Law*, GAO-15-621 (July 30, 2015), <https://gao.gov/assets/gao-15-621.pdf>.

³²⁰ Art. 4 GDPR, *Definitions*, INTERSOFT CONSULTING, <https://gdpr-info.eu/art-4-gdpr> (last visited Sept. 28, 2022) [hereinafter Art. 4 GDPR].

³²¹ *Id.*

³²² See *The Evolution of Biometric Data Privacy Laws*, BLOOMBERG L. (Nov. 3, 2021), <https://pro.bloomberglaw.com/brief/biometric-data-privacy-laws-and-lawsuits>.

³²³ See *id.*

³²⁴ See Brand & Pulliam, *supra* note 290.

Information Privacy Act (“BIPA”);³²⁵ specific notice and consent should be ensured when disclosing the data for commercial aims, as this required consent is limited to certain exceptions, encompassing biometric law and publicity rights laws.³²⁶

Biometric data is a particularly sensitive category that must be secured properly to avoid personal data breaches, which could lead to the “accidental or unlawful destruction, loss, alteration, unauthorized disclosure of, or access to personal data transmitted, stored, or otherwise processed.”³²⁷ In the case of data points identifying specific faces, a breach can amount to identity theft or future hacks using the identifier.³²⁸ Adequate security must be ensured when dealing with data, especially biometric information; data access should be restricted to individuals with a defined need for it; individuals without a need to access or use the information should not be able to access it; and appropriate physical and technical security standards should be ensured to minimize the risk of breaches.³²⁹ If a breach does happen, notification requirements must be fulfilled, and public relations concerns might ensue.³³⁰ Examples of security measures include: the precautions taken by football club Brøndby, namely the prevention of hacking by avoiding to connect the software and thus photos to the Internet; the cross-check aimed at minimizing false positives; and the limitation of the photos’ presence in the system to game day.³³¹

Venues using facial recognition should balance all the benefits and concerns mentioned above to implement an appropriate program compliant with all relevant legislation—possibly seeking advice from experienced legal teams.³³² They should consider safety, security, and individuals’ right, as well as the potential litigation risks based on claims of misuse or failure to obtain consent, mainly because these lawsuits often claim a violation penalty per person aggregating to millions of dollars.³³³

³²⁵ Kim Gale, *Man Files Lawsuit Over Former Employer’s Use of Biometric Fingerprint Scanner*, TOP CLASS ACTIONS (Sept. 14, 2019), <https://topclassactions.com/lawsuit-settlements/privacy/man-files-lawsuit-over-former-employers-use-of-biometric-fingerprint-scanner>.

³²⁶ Brand & Pulliam, *supra* note 290.

³²⁷ Art. 4 GDPR, *supra* note 320 at ¶ 9.

³²⁸ Brand & Pulliam, *supra* note 290.

³²⁹ *Id.*

³³⁰ *Id.*

³³¹ *Id.*

³³² *Id.*

³³³ *Id.*

When it comes to facial recognition, compliance with privacy laws will be enforced.³³⁴

At the end of January 2021, the “Guidelines on Facial Recognition, Convention 108 Consultative Committee” was published by the Council of Europe, thus establishing a rigorous code regulating facial recognition technology.³³⁵ These guidelines aim to prevent the high level of risks that these technologies entail in terms of data protection and privacy.³³⁶

In that same regard, the Commission Nationale de L’informatique et des Libertés (“CNIL”) is the French data protection authority.³³⁷ In February 2021, the CNIL issued a communication regarding protection issues raised by facial recognition systems that screen sports fans on stadium premises: these process biometric data, which belong to the special categories of data.³³⁸ Their processing is thus only allowed in specific cases pre-defined as exceptions, otherwise the default prohibition applies under both the GDPR and the French Data Protection Act.³³⁹ The CNIL also communicated information about a warning it issued to a French sports club that set up these technologies inside the premises for several purposes: banning entry, fighting terrorist threats, and locating lost property.³⁴⁰ Overall, the CNIL’s investigation into the club’s system, which was still in its experimentation phase, led to the conclusion that it was illegal, and thus, its use had to be halted.³⁴¹ The rationale behind that decision was that the facial recognition technology relied on biometric data processing, and that the purposes mentioned above did not fall under the exceptions of the GDPR Article 9(2).³⁴² However, an alternative would be to rely on Article 9(4) of the GDPR, which states that “[m]ember [s]tates may maintain or introduce further conditions,

³³⁴ Brand & Pulliam, *supra* note 290.

³³⁵ COUNCIL OF EUROPEAN, GUIDELINES ON FACIAL RECOGNITION (2021), <https://rm.coe.int/guidelines-on-facial-recognition/1680a134f3>.

³³⁶ *Id.*

³³⁷ See Sylvain Naillat, *The CNIL Warned a Sports Club Against Using Facial Recognition to Screen Supporters*, NOMOS (Mar. 19, 2021) <https://nomosparis.com/en/the-cnile-warned-a-sports-club-against-using-facial-recognition-to-screen-supporters-2> (identifying CNIL as the French data protection authority).

³³⁸ *Id.*

³³⁹ *Id.*

³⁴⁰ *Id.*

³⁴¹ *Id.*

³⁴² *Id.*

including limitations, with regard to the processing of genetic data, biometric data or data concerning health.”³⁴³ This implies that the legality of the biometric data processing as implemented by the club could be established if French law were to contain a legislative or regulatory provision explicitly allowing it. Further insights into each of the purposes for the processing provide a clearer picture of the CNIL’s reasoning.³⁴⁴ The purpose of finding lost items was not commented on, but intuitively, it would be considered too trivial to justify the authorization of biometric data processing.³⁴⁵ As for the biometric data processing with the aim of identifying individuals and fighting terrorism, it was not covered by any such provisions and could not, as such, be authorized.³⁴⁶ Facial recognition for commercial stadium bans could not be implemented either: although personal data processing (by sports clubs) for this purpose is authorized by specific provisions of the French Sports Code³⁴⁷ but these provisions do not encompass biometric data, as they are limited to processing of photographs for manual identification of the banned individuals.³⁴⁸ This communication issued by the CNIL is definitely not the only issue tackling the use of facial recognition in stadiums—the French DPA has also published some positions on real-life experimentations in different contexts. Many similar warnings are likely to follow.³⁴⁹

IV. IMPACT OF DATA ANALYTICS AND AI ON SPECIFIC REGULATORY FRAMEWORKS IN SPORTS

A. Data and AI-Powered Technologies in Authoritative Decision-Making

1. Applications of AI in Sports Adjudication

Algorithms powered by artificial intelligence can provide valuable insights in sports, namely in adjudication.³⁵⁰ This is

³⁴³ Art. 9 GDPR, *Processing of Special Categories of Personal Data, General Data Protection Regulation*, INTERSOFT CONSULTING, <https://gdpr-info.eu/art-9-gdpr> (last visited Sept. 28, 2022).

³⁴⁴ Naillat, *supra* note 337.

³⁴⁵ *Id.*

³⁴⁶ *Id.*

³⁴⁷ See Code du Sport art. L332-1 (Fr.); Code du Sport art. L332-14 (Fr.).

³⁴⁸ Naillat, *supra* note 337.

³⁴⁹ *Id.*

³⁵⁰ J.J. Shaw, *AI: Changing the Game*, SPORTCAL (Mar. 12, 2019),

because AI is capable of arbitrating even the subtler details that are sometimes invisible to the human eye.³⁵¹ A prime instance of innovation aiding referees in decision-making is the Hawk-Eye technology.³⁵² Besides allowing broadcasters to improve fans' at-home viewing experience, this camera system acts as an officiating tool—the most developed one in the realm of sports.³⁵³ It facilitates quick and accurate decision-making in real-time, by tracking the ball's trajectory at any point during the match and providing instant feedback.³⁵⁴ Thanks to its positive impact on game efficiency, minimization of interruption, and fairness and decision-making accuracy, its implementation has been increasingly widespread across disciplines, including in cricket, volleyball, ice hockey, NASCAR, horse racing, and the following sports.³⁵⁵

- In tennis, this technology is used for Electronic Line Calling, which generates consistent insights on the accuracy of line calls³⁵⁶ and would have proven useful back in the McEnroe days. It captures live footage, keeps tabs on ball indents and tracking, calculates bounce marks of the ball's contact area, and renders all this in real-time video footage along with the trajectory, ultimately enabling VR stats and post-match analysis.³⁵⁷
- Rugby union has also embraced Hawk-Eye's SMART Replay technology in decision-making, as well as for the treatment of player injuries.³⁵⁸
- In football, Hawk-Eye is the main technology to power Goal-Line Technology ("GLT") given its accuracy, FIFA license, and work with numerous sports leagues and federations.³⁵⁹ GLT's network of high-speed video cameras relies on triangulation to locate the ball's position at any given point in time, including assessments of whether it has crossed the goal-

<https://media.entertainment.lewissilkin.com/post/102fgi9/ai-in-sport-changing-the-game>.

³⁵¹ See *Hawk-Eye - Technology in Sport*, HARROD SPORT (Dec. 3, 2018), <https://harrod sport.com/advice-and-guides/hawkeye-technology-in-sport>.

³⁵² *Id.*

³⁵³ *Id.*

³⁵⁴ *Id.*

³⁵⁵ *Id.*

³⁵⁶ *Id.*

³⁵⁷ *Id.*

³⁵⁸ *Id.*

³⁵⁹ *Id.*

line in its entirety.³⁶⁰ Referees' watches then receive alerts sent by the software via radio transmission.³⁶¹ According to FIFA's plans, another method of adjudication in football, Video Assistant Referee ("VAR"), could soon benefit from the support of AI.³⁶²

2. Fight Against Doping, Athlete Biological Passport, AI Applications

Athlete Biological Passport:

A relatively recent development in the regulation against doping in sports competitions is the Athlete Biological Passport ("ABP").³⁶³ The traditional system relied on direct medical tests attempting to identify the presence of a doping substance or to detect the doping method and the "no start rule," excluding athletes from competitions when their hemoglobin levels surpassed the pre-defined limits.³⁶⁴ Instead, the principle at the core of the ABP is to track the variation over a period of time of some pre-identified biomarkers proved to indirectly bring to light the effects of doping.³⁶⁵ The purpose of this "modern-day technology" is to interpret the data contained in the ABP, such that it reveals which athletes to better aim the anti-doping activities at, such as target testing and investigations.³⁶⁶ The ABP can also be integrated by organizations in their broader anti-doping framework, with the aim of initiating proceedings against violations of anti-doping regulations under Article 2.2 of the World Anti-Doping Code.³⁶⁷

The World Anti-Doping Agency ("WADA") is the international independent governing body tasked with harmonizing and overseeing the collaborative anti-doping effort in all forms of sports on a global scale.³⁶⁸ Its role has made it the perfect

³⁶⁰ HARROD SPORT, *supra* note 351.

³⁶¹ *Id.*

³⁶² *Id.*

³⁶³ *Athlete Biological Passport*, WORLD ANTI-DOPING AGENCY (Nov. 14, 2013), <https://wada-ama.org/en/athlete-biological-passport>.

³⁶⁴ Wilfred Synrem, *Influence of Technology on Sports: A Policy Based Perspective*, 13 NUALS L. J. 51, 51–71 (2019).

³⁶⁵ *Athlete Biological Passport*, *supra* note 363.

³⁶⁶ *Id.*

³⁶⁷ WORLD ANTI-DOPING AGENCY, WORLD ANTI-DOPING CODE 1, 21 (2021), https://wada-ama.org/sites/default/files/resources/files/2021_wada_code.pdf.

³⁶⁸ *Who We Are*, WORLD ANTI-DOPING AGENCY, <https://wada-ama.org/en/who-we-are> (last visited Sept. 28, 2022).

candidate to initiate and develop the establishment of the ABP, thus paving the way for WADA's ABP Operating Guidelines (the "Guidelines"), which took effect in 2009.³⁶⁹ The Guidelines standardized the profiling of individual Athlete Hematological variables, a process used to detect blood doping, and the Steroidal Module, which sets up profiles of athletes' steroid variables over time.³⁷⁰ If the Guidelines are continually updated over time, it has been accompanied by an integration of the ABP into the strategy of several programs such as that of the International Federation ("IF") or National Association of Development Organizations ("NADO").³⁷¹ Consequently, two numbers have increased significantly: direct anti-doping rule violations ("ADRVs") and adverse analytical findings ("AAFs") resulting from targeting established by the ABP.³⁷² The WADA has also undertaken the task of mitigating the ABP's risks related to privacy and data protection, a tedious task that will be detailed further along in this essay.

Anti-doping efforts and AI:

More recently, WADA Senior Executive Director, Olivier Rabin, explained in an interview: "[w]hen you are working for an anti-doping organization and you want to target some athletes, you look at their competition calendar and you look at their whereabouts, you look at the previous results and so forth. But there is (only) so much a brain can process in terms of information."³⁷³ In this regard, prompted by the implications of the Covid-19 pandemic on sports and on anti-doping testing, the WADA has been investigating the possibility of using AI technology to detect drug use among athletes.³⁷⁴ Through funding, it is contributing to four such projects aimed at testing whether indicators of doping can be identified by AI—even more thoroughly than by human investigators with the necessary experience.³⁷⁵ WADA is also careful about the ethical implications

³⁶⁹ *Athlete Biological Passport Operating Guidelines*, WORLD ANTI-DOPING AGENCY 1, 4 (2021), https://wada-ama.org/sites/default/files/resources/files/guidelines_abp_v8_final.pdf.

³⁷⁰ *Id.* at 5–6.

³⁷¹ *Id.* at 13.

³⁷² See *Athlete Biological Passport*, *supra* note 363.

³⁷³ James Ellingworth, *WADA Looks to Artificial Intelligence to Catch Dopers*, AP NEWS.COM (May 26, 2020), <https://apnews.com/article/3068308c761132a1485bb9c2848d130d>.

³⁷⁴ *Id.*

³⁷⁵ *Id.*

and issues that might arise from the use of such techniques: AI will not act as a sole determinant of athletes' suspensions, but rather as a tool used to detect players suspected of doping and to ensure they are subjected to further testing.³⁷⁶

As mentioned above, ABP relies on a system that is not limited to the identification of the actual doping substance: tests conducted on blood or urine samples also study several biological variables, including testosterone levels and red blood cell count.³⁷⁷ The ABP program allows identification of the effects of certain substances such as the blood-booster Erythropoietin ("EPO"), which was used by Lance Armstrong.³⁷⁸ By leveraging AI, WADA's goal is to spot patterns between such biomarkers, while also cross-referencing them with additional data, to ultimately enhance the above system adopted by the ABP.³⁷⁹ Two of WADA's projects hope to refine the precision of EPO and steroids detection.³⁸⁰ Here, ML comes into play because such systems can spot patterns and similarities that are not visible to the human eye, by learning from examples of profiles already classified as "clean" or "dirty."³⁸¹ Another project, qualified by Olivier Rabin as "global," could forecast doping risk based on the assessment of data originating from various sources.³⁸² These sources might encompass location information that athletes are required to provide.³⁸³ In line with privacy concerns, personal data of players—including their cities of residence and training—will be anonymized.³⁸⁴

From another perspective, research efforts have directed their focus on identifying the criteria to expose the wide range of performance-boosting substances and methods that elevate the oxygen carrying capacity of blood—namely, oxygen carriers, blood doping, human recombinant erythropoietin, the off/on model.³⁸⁵ Testing control procedures incur costs and raise the question of who should be tested, when, and based on which

³⁷⁶ See Ellingworth, *supra* note 373.

³⁷⁷ *Id.*

³⁷⁸ *Id.*

³⁷⁹ See *id.* ("WADA hopes AI can help improve that system by tracking patterns between those markers and cross-referencing them with other information.")

³⁸⁰ *Id.*

³⁸¹ *Id.*

³⁸² *Id.*

³⁸³ *Id.*

³⁸⁴ *Id.*

³⁸⁵ *Id.*

criteria.³⁸⁶ This has long been done by international federations through “random selection, standings, high hemoglobin/hematocrit/reticulocyte counts, off model scores” or others, due to the absence of an accurate method integrating the entirety of variables encompassing both lab values and variations in individual performance.³⁸⁷ To answer this need in the fight against doping, the A.R.I.E.T.T.A project (“Artificial Intelligence Evoking Target Testing in Anti-doping”) has been put in force.³⁸⁸ By producing estimates by providing classifications associated to diagnostic probabilities, this intelligent system would optimize the selection of the right athletes at the right time in the context of anti-doping target tests both in and out of competitions.³⁸⁹ This would be done by detecting athletes with several variables, including hematological values, which reveal a pattern in accordance with the adoption of banned substances or methods.³⁹⁰ The software would base the assessment of abnormal hematological values not only on their high level but also on the simultaneous consideration of raw data relating data to the reference population, comparing intra-individual variations including abnormal low data, changes in performance, ranking, and country.³⁹¹ The characteristics of the system would be its fast pace with multiple data being evaluated concurrently, unpredictability, and capacity for self-learning with the generated information being automatically included and leveraged to enhance the knowledge.³⁹² Besides the cost-efficiency of target testing, the A.R.I.E.T.T.A project pushes to disincentivize doping and evasion through manipulation by aiming for higher efficiency of testing.³⁹³

Legal implications:

The GDPR’s scope of application encompasses the majority of data processing conducted as part of the anti-doping framework, as long as organizations are either based or operating, *such as*

³⁸⁶ F. Manfredini et al., *A.R.I.E.T.T.A Artificial Intelligence Evoking Target Testing in Anti-doping*, WORLD ANTI-DOPING AGENCY (Feb. 15, 2020), https://wada-ama.org/sites/default/files/resources/files/05d21fm_manfredini_0.pdf.

³⁸⁷ *Id.*

³⁸⁸ *Id.*

³⁸⁹ *Id.*

³⁹⁰ *Id.*

³⁹¹ *Id.*

³⁹² *Id.*

³⁹³ *Id.*

targeting athletes, on EU territory.³⁹⁴ However, anti-doping practices often clash with the principles of fair information, such as when data retention terms exceed the appropriate level, data quality, integrity, and confidentiality.³⁹⁵ The specific goals and extent of processing are not always well-defined by anti-doping organizations, and its legitimacy is sometimes problematic because it requires documenting activities, appointing a Data Protection Officer (“DPO”), and executing a Data Protection Impact Assessment (“DPIA”) if deemed necessary.³⁹⁶ Particular concerns include transferring personal data to third countries and processing sensitive personal data.³⁹⁷ Some anti-doping practices also threaten athletes’ rights to information, to object, and to be forgotten.³⁹⁸ Since the principles set out by the GDPR account for other interests, the former cannot be overridden by the latter—not even by the fight against doping.³⁹⁹ Thus, the framework that anti-doping organizations need to observe encompasses the rules established by both the GDPR and the European Court of Human Rights (“ECHR”).⁴⁰⁰ Fundamental human rights—the highest principles as established by the EU and the Council of Europe include the rights to: data protection, a fair trial in Article 6 of the ECHR, privacy in Article 8 of the ECHR, and non-discrimination in Article 14 of the ECHR:⁴⁰¹ infringing activities or policies would be deemed human rights violations.⁴⁰²

The ABP is controversial for two reasons: (1) it contains prolonged profiling of athletes’ blood and urine values, which can deeply affect their right to privacy; and (2) its effectiveness in proving direct violations of anti-doping legislation has not been supported by sufficient evidence because its main impact appears to be its disincentivizing role and the data it provides.⁴⁰³ None of approximately 30,000 ABP results are either Atypical Findings or Adverse Analytical Findings.⁴⁰⁴ Anti-doping testing procedures

³⁹⁴ See BART VAN DER SLOOT ET AL., *ATHLETES’ HUMAN RIGHTS AND THE FIGHT AGAINST DOPING: A STUDY OF THE EUROPEAN LEGAL FRAMEWORK* 135 (2020).

³⁹⁵ *Id.* at 183.

³⁹⁶ *Id.* at 246.

³⁹⁷ *Id.* at 16478.

³⁹⁸ *Id.* at 246.

³⁹⁹ See *id.* at 169–70.

⁴⁰⁰ *Id.* at 246.

⁴⁰¹ 6-14 Eur. Ct. H.R. (1950).

⁴⁰² See *id.*

⁴⁰³ VAN DER SLOOT, *supra* note 394, at 237.

⁴⁰⁴ *Id.* at 202.

implemented by organizations such as WADA raise several doubts. One of these regards the necessity and proportionality of a general, identical application of the rules across all disciplines when most violations involve the same few sports.⁴⁰⁵ Another issue is the claim of testing authority, which is done directly by anti-doping agencies, thus granting each NADO full discretion on how to apply its powers and which individuals to subject to anti-doping tests.⁴⁰⁶

The International Standard for the Protection of Privacy and Personal Information (“ISPPPI”)⁴⁰⁷ is a code designed by the WADA to recognize athletes’ privacy rights and avoid issues linked to the protection of their sensitive personal data, such as their health and biometric data.⁴⁰⁸ It sets out rules and standards that are mandatory for anti-doping organizations to safely process sportspersons’ information—including the prompt disclosure of all tests whether in-competition or out-of-competition—to the WADA Clearinghouse.⁴⁰⁹ In addition to providing for the customary data processing norms, the Code regulates test distribution by prohibiting avoidable duplication of samples.⁴¹⁰ If the GDPR sets a standard for general data protection matters and ways to deal with a data breach, a gap remains between the emerging technologies increasingly widespread in sports.⁴¹¹ Sports data might require the drafting and implementation of specific standards or a specific code, much like the ISPPPI.⁴¹²

While these concerns regard the anti-doping framework as a whole, they are reinforced by controversial uses of ABP and data analytics, and AI technology in the fight against doping in sports.⁴¹³ Another example is the Universal Forensic Extraction Device (“UFED”), which the Australian Sports Anti-Doping Authority recently licensed, allowing it to circumvent passwords,

⁴⁰⁵ VAN DER SLOOT, *supra* note 394, at 257.

⁴⁰⁶ *Id.*

⁴⁰⁷ *See World Anti-Doping Code — International Standard for the Protection of Privacy and Personal Information*, WORLD ANTI-DOPING AGENCY 1, 4 § 1 (2021) (explaining the purpose, scope, and intention of the ISPPPI).

⁴⁰⁸ *See id.* at 11, §5.

⁴⁰⁹ *See id.* at 21–22, Annex A.

⁴¹⁰ Synrem, *supra* note 364, at 63–64.

⁴¹¹ *Id.* at 71.

⁴¹² *Id.*

⁴¹³ *See id.* at 64–65 (discussing high-profile doping accusations arrived at through ABP technology).

patterns, and PIN locks, and to hack athletes' phones if they are suspected of doping.⁴¹⁴

B. Integration of Technology into the Sports Betting Industry

1. Practical Applications of Technology in Sports Gambling

The U.S. Supreme Court's ruling (2018) in *Murphy v. National Collegiate Athletic Association* overturned the Professional and Amateur Sports Protection Act ("PASPA"), a federal law banning sports gambling in almost every state,⁴¹⁵ and is the catalyst for many of the activities detailed below and their legal character.⁴¹⁶

The sports betting industry has been increasingly impacted by the combination of enhanced data analytics and AI, instant tracking of athlete data to generate projections, prediction tools, and micro-betting.⁴¹⁷ In football, goals can be forecast two seconds before they actually happen by relying on computer vision technology, namely offered by Sportradar and Amazon.⁴¹⁸ This could lead to the development of numerous mobile-led bets and products, which would be offered to wide audiences in real-time during live sporting events, and potentially generate significantly huge revenues.⁴¹⁹ But considering only a small fraction of it goes back to leagues, and even less to athletes, what about the data required for the advancement of sports betting methods? Would leagues and athletes share their data and make it publicly available for the benefit of betting companies? Combining AI and sports betting raises questions closely linked to data issues and privacy matters.⁴²⁰

⁴¹⁴ Synrem, *supra* note 364, at 64–65.

⁴¹⁵ *Murphy v. Nat'l Collegiate Athletic Ass'n*, 138 S. Ct. 1461, 1485 (2018).

⁴¹⁶ See *infra* notes 405–24 and accompanying text (discussing the developments within legalized sports betting following the ruling in *Murphy*, 138 S. Ct.).

⁴¹⁷ See Rory P. Bunker & Fadi Thabtah, *A Machine Learning Framework for Sport Result Prediction*, 15 APPLIED COMPUTING & INFORMATICS 27, 27–33 (2019) (showing the applicability of machine learning concepts to sports prediction).

⁴¹⁸ Mark Gorski, *The 'Moneyball' Evolution: Artificial Intelligence, Athlete Data And The Future Of Sports Betting*, FORBES (Feb. 11, 2021), <https://forbes.com/sites/forbestechcouncil/2021/02/11/the-moneyball-evolution-artificial-intelligence-athlete-data-and-the-future-of-sports-betting>.

⁴¹⁹ See Timothy L. O'Brien & Elaine He, *The Sports Gambling Gold Rush Is Absolutely Off the Charts*, BLOOMBERG (Dec. 16, 2021), <https://bloomberg.com/graphics/2021-opinion-online-sports-betting-future-of-american-gambling> (discussing sports betting since 2018, preferred methods of bet placing, and revenue growth in the sector generally).

⁴²⁰ See Synrem, *supra* note 364 at 54 (stressing individual sports figures'

Nonetheless, sports analytics companies have been investing in ML and AI with the hopes of powering more opportunities in the sports gambling industry for both online and on-site wagering throughout the U.S.⁴²¹ With the possibility to capitalize on the U.S. government's decision to legalize sports, these data companies are developing AI-powered proprietary algorithms that provide cutting-edge insights into possible outcomes, including predictive data on player performance, win probability metrics, and matchup odds.⁴²² But combining machine learning with sports outcome prediction is nothing new; it is commonly used by professionals to test and improve their ML models.⁴²³ In 1996, Purucker relied on a neural network model to predict NFL results, reaching 61% accuracy.⁴²⁴ In 2003, this work was expanded by Kahn; by collecting data from 208 matches, it ultimately achieved 75% accuracy.⁴²⁵ There are considerably many similar studies, like Tax and Joustra (2015): outcomes of future matches were forecast by leveraging data collected from Dutch Football competitions, while also considering the betting odds as variables in the ML models.⁴²⁶

Integrating such technology into sports betting could potentially lead to benefits and facilitate access, but it would also present own set of challenges.⁴²⁷ Legalized gambling as per the *Murphy v. NCAA* ruling is the reason why this integration even became feasible in the first place—regardless of whether its dramatic impact on the future use of technology in sports betting

privacy interests).

⁴²¹ See, e.g., Daliana Zhen Liu et al., *Predicting Soccer Goals in Near Real Time Using Computer Vision*, AWS MACH. LEARNING BLOG (Dec. 8, 2020), <https://aws.amazon.com/blogs/machine-learning/predicting-soccer-goals-in-near-real-time-using-computer-vision>.

⁴²² *Id.*

⁴²³ Manuel Silverio, *My Findings on Using Machine Learning for Sports Betting: Do Bookmakers Always Win?*, TOWARDS DATA SCI. (Aug. 26, 2020), <https://towardsdatascience.com/my-findings-on-using-machine-learning-for-sports-betting-do-bookmakers-always-win-6bc8684baa8c>.

⁴²⁴ M.C. Purucker, *Neural Network Quarterbacking*, 15 IEEE POTENTIALS 9, 10 (1996).

⁴²⁵ Joshua Kahn, *Neural Network Prediction of NFL Football Games*, DOCPLAYER 1, 8, <https://docplayer.net/21763052-Neural-network-prediction-of-nfl-football-games-joshua-kahn.html> (last visited Sept. 8, 2022).

⁴²⁶ Niek Tax, *Predicting The Dutch Football Competition Using Public Data: A Machine Learning Approach*, TRANSACTIONS ON KNOWLEDGE & DATA ENG'G (forthcoming), <http://doi.org/10.13140/RG.2.1.1383.4729>.

⁴²⁷ See Gorski, *supra* note 418 (detailing potential regulatory, privacy, and overall pragmatic concerns that this technology may engender).

was taken into consideration at the time of the decision.⁴²⁸ This impact stretches to:

- Fan rights: as their engagement in matches continues to increase through innovative concepts such as the Fan Controlled Football league, sports organizations should consider the regulatory implications of leveraging supporters' information and involvement.
- Fantasy sports: DraftKings, a company that offers fantasy sports contests, launched its own sports betting mobile app.⁴²⁹ Provided betting on Fan Controlled Football is authorized, supporters behind the decision-making could be prevented by the emerging league from taking part in the gambling activities.⁴³⁰

Integrating technology into sports gambling presents some benefits to teams, leagues, fans, and regulators.⁴³¹ The sports industry would benefit from an economic boost: fans using their phones to place bets and share their experiences on social media would be more involved in games, thus boosting sales of tickets and merchandise, TV viewership, and publicity for teams.⁴³² By investing in online gambling (sometimes to the point of customizing stadium experience towards it), teams could promote themselves and their players.⁴³³ Leagues could increase their value and access some market share through the endorsement of specific apps, providers, or firms involved, which is a proven model in online fantasy sports.⁴³⁴ Another theory is that sports betting would benefit from enhanced security as this market already existed in the U.S. on both levels, its legalization would push underground sports betting into legal gambling that would

⁴²⁸ See Gorski, *supra* note 418.

⁴²⁹ Andrew Cohen, *DraftKings Launches Standalone Gambling Mobile App*, SPORTTECHIE (June 24, 2020), <https://sporttechie.com/draftkings-launches-standalone-gambling-mobile-app>.

⁴³⁰ Masters, *supra* note 40.

⁴³¹ See Gorski, *supra* note 418.

⁴³² See Howard Stultz, *Increased fan engagement from legal sports betting fuels valuable sports media deals*, CDC GAMING REPS. (Apr. 10, 2021), <https://cdcgaming.com/commentary/increased-fan-engagement-from-legal-sports-betting-fuels-valuable-sports-media-deals>.

⁴³³ See Wayne Perry, *Pro Teams Bring Betting to the Game with Stadium Sportbooks*, AP NEWS (Feb. 2, 2022), <https://apnews.com/article/chicago-bulls-nhl-mlb-nba-nfl-5cf26555961dfa458aa23dfe0edfb7f7>.

⁴³⁴ See David W. Chen, *The N.F.L.'S About-Face on Sports Gambling*, N.Y. TIMES (Feb. 13, 2022), <https://nytimes.com/2022/02/10/sports/nfl-bets-gambling.html>.

be regulated and taxed by the government and facilitated by technology.⁴³⁵

2. Legal Implications of the Tech/Sports-Betting Mix

Gambling and betting activities in sports have a huge potential in terms of revenue,⁴³⁶ so what would be the incentive for leagues and players to share their data publicly?

To this day, betting companies have relied on observable event data gathered from watching competitions, sometimes even collected by unofficial data scouts.⁴³⁷ This data does not belong to leagues, leading them to benefit from a relatively unimportant fraction of the profits—and an even smaller one in the case of athletes.⁴³⁸ This is where athlete data generated by sensors and wearable tech come into play.⁴³⁹ Since it cannot be observed by external firms as easily, it would require access to the leagues' channels and databases, and thus the conclusion of agreements between data providers and acquirers; consequently, athletes and leagues would be empowered with more control over the sharing conditions and venues of these datasets.⁴⁴⁰ The incorporation of athlete data in the betting ecosystem—odds adjustment and predictive models—would not necessarily require the public sharing of health data, yet it could generate billions of dollars in revenues.⁴⁴¹ Stakeholders would have to reach an agreement on several elements, starting with the buy-in of teams, players, and leagues and extending to the characteristics of the data sale: types, value, means, and distribution of revenues.⁴⁴²

A deeper insight into the U.S. case can shed light on the situation: every new bet type has to be approved by regulators, implying the standardization of athlete-tracking means within the same league.⁴⁴³ They must also reach some standards

⁴³⁵ Tucker Davidson, *Merging Sports Gambling and Technology: What's Really Going to Happen?*, 22 SMU L. REV. 165, 177–78 (2019).

⁴³⁶ *NBA & MLB Could See Combined \$1.7 Billion From Legalized Sports Betting*, AM. GAMING ASS'N, (Oct. 18, 2018), <https://americangaming.org/new/nba-mlb-could-see-combined-1-7-billion-from-legalized-sports-betting>.

⁴³⁷ James Glanz & Agustin Armendariz, *When Sports Betting Is Legal, the Value of Game Data Soars*, N.Y. TIMES, <https://nytimes.com/2018/07/02/sports/sports-betting.html>.

⁴³⁸ Gorski, *supra* note 418.

⁴³⁹ *Id.*

⁴⁴⁰ *Id.*

⁴⁴¹ *Id.*

⁴⁴² *Id.*

⁴⁴³ *Id.*

guaranteeing a threshold of output accuracy, reliability and repeatability.⁴⁴⁴ Requirements applying to data collection techniques include the minimization of their intrusive character, and the optimization of accuracy through appropriate placement on the body.⁴⁴⁵ This reality might not be so far stretched into the future, as several initiatives are increasingly taking these potential markets for athlete data into consideration: legislation tackling this area of sports betting has been passed in some states, like Illinois.⁴⁴⁶ Arising monetization models for sensitive medical data rely on individuals' consent, thus potentially mitigating the ethical concerns and privacy issues.⁴⁴⁷ The sports betting ecosystem is bound to benefit from an increase in value if athlete data were to become widespread through the potential metamorphosis of prediction systems and data-distribution capabilities of leagues.⁴⁴⁸

The aforementioned 2018 U.S. Supreme Court ruling *Murphy v. NCAA*⁴⁴⁹ has resulted in a plethora of legal challenges faced by sports organizations regarding game integrity, revenue distribution, and privacy protection for betters.⁴⁵⁰ That same year, a decision by the U.S. Department of Justice ("DOJ") established that the scope of the Federal Wire Act would encompass sports gambling but also non-sports gambling, which was a reversal from an earlier decision.⁴⁵¹ This could lead to huge ramifications on online wagering, an activity that has been implemented in a mere handful of states due to the controversy over the DOJ decision.⁴⁵² Given that sports betting increasingly relies on data analytics, reinforced control and supervision are required: the securing of athletes' publicity and privacy rights is crucial now more than ever.⁴⁵³ Players unions from the Big Four

⁴⁴⁴ Gorski, *supra* note 418

⁴⁴⁵ *Id.*

⁴⁴⁶ S.B. 690, 101st Gen. Assemb. (Ill. 2020) (summary available at https://www2.illinois.gov/HISNews/20266-SB_690_Summary.pdf).

⁴⁴⁷ Gorski, *supra* note 418.

⁴⁴⁸ *Id.*

⁴⁴⁹ *Murphy v. NCAA*, 138 S. Ct. 1461 (2018).

⁴⁵⁰ See Brian Finch & Johanna Purcell, *Increasing Markets for Sports Betting Could Lead to Cybersecurity and Data Privacy Risks for Companies and Consumers*, JD SUPRA (May 11, 2022).

⁴⁵¹ Howard Stutz, *DOJ Reverses 2011 Opinion of the Wire Act; Legal Online Gaming in Question*, CDC GAMING REPS. (Jan. 15, 2019), <https://cdcgamingreports.com/doj-reverses-2011-opinion-of-the-wire-act-legal-online-gaming-in-question>.

⁴⁵² See *id.*

⁴⁵³ See Bryan B. Fisher, *The Evolution of Data in Sports Betting and Its Legal*

U.S. leagues have declared their intention to safeguard these rights.⁴⁵⁴

Potential technical issues are arising at the intersection of sports gambling and technology as a direct consequence of the legalization of sports betting under *Murphy v. NCAA*.⁴⁵⁵ The following is a non-exhaustive list of three such issues.

- The ruling gives states the discretion to regulate sports gambling, but how can states and software guarantee that bets placed online do not cross state borders?⁴⁵⁶ Advanced GPS devices can solve this issue, since they are already used by fantasy sports businesses such as FanDuel and DraftKings, who faced a similar problem of geographic location.⁴⁵⁷
- What about the determined legal gambling age in each state, which has consistently ranged between eighteen and twenty-one?⁴⁵⁸ The Children’s Online Privacy Protection Act⁴⁵⁹ recognizes that some websites and apps, such as social media services, should contain age restrictions by placing the burden on developers.⁴⁶⁰ However, online verification of age and IDs is trickier than for in-person activities due to the lack of an online verification system in the U.S.⁴⁶¹ Indeed, this is because “establishing a national identity database, tracking users’ behavior or knowing the data on a person’s phone that might suggest an age group” would be unconstitutional as it would violate online personal privacy.⁴⁶²
- At the crossroads between technology and betting, how can

Ramifications on the Privacy and Protections of College Athletes, 69 CLEV. STATE L. REV. 1, 11–16, (2021) (discussing how athletes’ private data may be exploited in sports gambling and some current protections to mitigate those risks).

⁴⁵⁴ Chris Crouse, *NFL, MLB, NBA, and NFL Players Unions Join Legal Sports Gambling Debate*, CNBC SPORTS (Apr. 13, 2018), <https://cnbc.com/2018/04/12/nfl-mlb-nba-nhl-players-unions-join-legal-sports-gambling.html>.

⁴⁵⁵ Tucker Davison, *Merging Sports Gambling and Technology: What’s Really Going to Happen?*, 22 SMU SCI. & TECH. L. REV. 165, 173–75 (2019) (discussing the technological issues and benefits post *Murphy v. NCAA*).

⁴⁵⁶ *Id.* at 173.

⁴⁵⁷ *Id.* at 174.

⁴⁵⁸ *See Your Guide to Gambling in Every US State*, CASINO.ORG (last visited Nov. 11, 2022) (compiling the laws proscribing the legal gambling age within each of the fifty states, all of which set the minimum age between 18 and 21).

⁴⁵⁹ 15 U.S.C. §§ 6501–6506.

⁴⁶⁰ 15 U.S.C. §§ 6501, 6502; *see also* Davison, *supra* note 455 at 174.

⁴⁶¹ Davison, *supra* note 455 at 174–75.

⁴⁶² Nicole Perlroth, *Verifying Ages Online is a Daunting Task, Even for Experts*, N.Y. TIMES (June 17, 2012), <https://nytimes.com/2012/06/18/technology/verifying-ages-online-is-a-daunting-task-even-for-experts.html>.

individuals be shielded from their own actions, namely by the risk of combining in a single source two addictions, both with worrying statistics?⁴⁶³ Owner of the Dallas Mavericks Mark Cuban stated it was easy to address this issue through state cooperation.⁴⁶⁴ His suggestion would be to enable the generation of tax revenue directed at funding programs to prevent gambling addiction, in addition to regulating betting by using a uniform cryptocurrency.⁴⁶⁵ Once it is decided which cryptocurrency would best qualify as this standard, who will regulate it, and how they will do so, this method would reinforce cybersecurity and track partakers in online sports gambling to shelter them from addiction.⁴⁶⁶

V. CONCLUSION

Data analytics and AI continue their ascension in the world of sports on a mission to drive developments in a myriad of fields.

Such instances include the use of wearable technologies and AI systems in the processing of athletes' personal data to support strategic decision-making.⁴⁶⁷ Indeed, the value of data analytics in sports is not to be underestimated, as Trevor Watkins, global head of sports at the Pinsent Masons law firm, explains: "[f]or a football club the most important factor is improving your chances of winning" and this is where probability measures come into play.⁴⁶⁸ Other aspects of the data revolution in sports encompass the deployment of technologies as a means of transforming the sporting experience, and the alteration of venues to accommodate for systems such as facial recognition. But mixing sports and technology is a double-edged sword as it gives rise to diverse legal issues.⁴⁶⁹ For instance, overcoming automation biases is particularly important in the realm of sports, which finds its

⁴⁶³ Davison, *supra* note 455 at 175.

⁴⁶⁴ *Mavericks Owner Mark Cuban on the Future of Sports Betting*, CNBC (May 14, 2018), <https://cnbc.com/video/2018/05/14/mavericks-owner-mark-cuban-on-the-future-of-sports-betting.html>.

⁴⁶⁵ *Id.*

⁴⁶⁶ *See* Davison, *supra* note 455 at 175 (discussing the increased risk of gambling addiction due to the accessibility presented in online sports betting and solutions to combat this issue).

⁴⁶⁷ *See supra* Section II.1.

⁴⁶⁸ J. Harper, *Data Experts Are Becoming Football's Best Signings*, BBC NEWS (Mar. 5, 2021), <https://bbc.com/news/business-56164159>.

⁴⁶⁹ *See, e.g.,* Lazzarotti et al., *supra* note 75; Studnicka, *supra* note 128 (discussing concerns about data privacy and security and risk of data breaches).

roots in the principle of fair play.⁴⁷⁰ In *Moneyball*, Demetri Martin, who portrayed Peter Brand, delivers the following line: “People are overlooked for a variety of biased reasons and perceived flaws. Age, appearance, personality. Bill James and mathematics cut straight through that.”⁴⁷¹ The hope is for technology to achieve exactly that and for the law to guarantee it. Moreover, while data analytics can impact the controversial sports-betting industry, AI can have profound implications in SGBs’ decision-making—namely in sports adjudication and anti-doping initiatives.⁴⁷² Here, too, the ensuing data-protection and privacy concerns are not to be underestimated. As WADA Senior executive director Olivier Rabin put it: “It [is] . . . fairly complex . . . to try to find a balance between . . . protecting data, protecting individuals and making sure that you can still reveal the potential of AI, if there is any.”⁴⁷³

Considering these insights, it appears that AI and data analytics will continue to challenge the established legal frameworks and ethical norms of modern society. Although this technological and regulatory shift contains an element of uncertainty, the ensuing legal challenges are not completely unpredictable. Regulators and scholars are investigating how to adapt the current frameworks and create new legislation to keep up with developments and accommodate for emerging technologies.⁴⁷⁴ Meanwhile, stakeholders of the sports industry should carefully navigate the myriad of co-existing legislations with far-reaching scopes encompassing their activities. It has become crucial to find the appropriate balance between leveraging the potential benefits of technology’s integration to sports and minimizing the likelihood of arising legal risks. It remains interesting to monitor future developments at the intersection of these fields and the challenges they will bring.

But as potential applications of technology in traditional sports are numerous, they can also provide solutions to the very problems they pose. Blockchain technology, for instance, functions quite differently from the methods tackled in this essay.⁴⁷⁵ Yet, it has started to be deployed in the world of sports

⁴⁷⁰ See Waddell, *supra* note 114.

⁴⁷¹ *MONEYBALL* (Columbia Pictures 2011).

⁴⁷² See *supra* Section IV.

⁴⁷³ See Synrem, *supra* note 364.

⁴⁷⁴ See Nolan & Steele *supra* note 13.

⁴⁷⁵ See Mikaela Kantor & Iacovos Kouppas, *Football and Blockchain: Can They*

for several purposes: for the implementation of safer, more efficient financial transactions between clubs and fans via cryptocurrencies,⁴⁷⁶ but also for the supervision of compliance with regulations like the GDPR.⁴⁷⁷ Developments that remain interesting to track are the tokenization of players and the transfer matching system, the utilization of smart contracts, and the record-keeping for data collection.⁴⁷⁸

"Kick it Off?", DATADRIVENINVESTOR (June 10, 2020), <https://medium.data-driveninvestor.com/football-and-blockchain-can-they-kick-it-off-db782dcae855>.

⁴⁷⁶ *Id.*

⁴⁷⁷ *Id.*

⁴⁷⁸ See Kantor & Kouppas, *supra* note 475.