



Hyperrealistic Jurisprudence: The Digital Age and the (Un) Certainty of Judge Analytics

Daniel Brantes Ferreira¹ · Elizaveta A. Gromova²

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Abstract

This article is the first attempt to justify the "next" milestone in the development of legal realism: hyperrealism. The implications of digitalization have become the new fuel for the legal realist's jurisprudence prediction theory, that is, empirical research to predict the judge's or the court's decision. Indeed, that was impossible for American realists in the early twentieth century, and all the attempts failed. Therefore, tools such as Judicial Analytics allow us to prove that personal motives and prejudices affect a dispute's resolution. Based on a systemic, comparative, and interdisciplinary analysis that intermingles legal theory, data analytics and digital technologies, the article substantiates the concept of hyperrealism itself. It evaluates the advantages and disadvantages of its primary tool—judicial analytics. The authors state the necessity of creating regulatory mechanisms of "curbing" to use them to improve justice and minimize the risk of rights violations. They propose using tools of expert evaluation, standardization, and ethical regulation of forensic analysis.

Keywords Hyperrealism · Legal realism · Data analytics · Judge analytics · Legal decision making

✉ Daniel Brantes Ferreira
Daniel.brantes@gmail.com

Elizaveta A. Gromova
Gromovaea@susu.ru

¹ CEO, Brazilian Center for Mediation and Arbitration – CBMA, Rio de Janeiro, Brazil

² Department of Business Law, Deputy Director for the International Cooperation, South Ural State University (National Research University), Chelyabinsk, Russia

1 Introduction

We wonder how the famous biblical quote: "Neither do men put new wine into old bottles"¹ would sound if we could modernize old bottles using new tools.

The legal realism movement started in 1930 and stated that legal formalism or legal positivism is somewhat wrong [64, 78]. Authors of legal realism strains advocate an interdisciplinary approach to the Law that implies the use of sociology, psychology, and other areas in the analysis of jurisprudence. At the time, realists lacked the digital tools to reach the desired results by using empirical research applied to Law.

But times have changed. The Fourth Industrial Revolution and the shift in the scientific and technological order have led to the flowering of digital technology and innovation. These technologies are already changing our lives and can transform our perceptions.

Literature review showed a significant number of papers were published in the sphere of legal realism analysis [62, 68] as well as on the use of technologies in justice.² It is noteworthy that some authors have written about *New Legal Realism*. Some authors claim that New Legal Realism is empirical research not limited to judicial decision-making (adding, for example, arbitration) and focusing on the judge's political ideology [63]. Others claim that New Legal realism tends to concentrate the empirical research in lower federal courts [68]. Some attempted to map New Legal Realism types [75]. Others attempted to show the influence of case law in real life (labor law more specifically) [33]. Finally, some claim that the so-called new legal realism is just the contemporary use of empirical research which implicates the use of the same old paradigm of the 1930s realists who attempted to assess through social sciences what courts do [51, 52].

The term hyperrealism jurisprudence has been used to address the "*hyperreal identities of the Woman and the Colored*" in Swedish criminal law [36]. Though it is a paper on a Scandinavian research problem, it does not deal with legal hyperrealism as a natural evolution of the Scandinavian realistic movement. It is concerned with developing the ethics of ambiguity in law through Simone de Beauvoir's literature. Therefore, it has no theoretical relation with the legal realism movements, let alone to our legal hyperrealism conception.

Our approach is different. Our starting point is the same as the old realists: empirical research to determine what courts and other decision-makers do. Therefore, our analysis concentrates on the instrumentalist authors who believed that judges are lawmakers and that this law should follow social realities based on sociological data and empirical research [20]. Nevertheless, our focus is on the current research tools, the digital tools. Every lawyer wants to know how a judge thinks to predict³ his decision. Technology advancement and unstoppable digitalization are making that more and more possible. There is no new legal realism. However, there is hyperrealism,

¹ Matthew 9:17 of the King James Bible.

² See Ambrogi [3]; Aletras et al. [2]; and Medvedeva et al. [64].

³ This paper focuses on the legal realist's jurisprudence prediction theory, even though we cannot connect it to all realists. See Leiter [48].

which is the optimization of the old legal realism foundations by the new tools that give lawyers a complete HD picture of courts.

The purpose of this paper is to unfold a hyperrealistic approach to Law as an evolution of American legal realism (less philosophical and more result oriented than the Scandinavian movement), just like in arts where nineteenth century artists inspired the twentieth century legal realism movement, the late twentieth/twenty-first century hyperrealism in arts can inspire a hyperrealistic approach of the Law. The literature and theoretical breeding explored in this research are predominantly American to achieve this purpose. Also, most of the legal references are to the US court system. Therefore, we will focus on one main characteristic of legal realism: the never-ending paradigm of what courts say they are doing and what they are doing. The attempt for that study was rudimentary long-lasting, and costly empirical research with no efficient data analysis. The game has become entirely different in the twenty-first century. Digital technologies can be considered a game changer in decision-making analysis. Using algorithms, AI, profiling software, data mining, text mining, and jurimetrics gives the court's decisions some sense and predictability.

The methodology used is systemic and comparative analytical methods. Applying the systematic approach allowed us to consider hyperrealism as a unique system of ideas about the reasons for judges' decision-making, as well as a set of digital tools that enables us to analyze the behavior of judges. The comparative-legal method allowed us to compare and identify approaches to evaluating judge analytics by scholars and states. We also applied interdisciplinary analysis that intermingles legal theory, arts (realism and hyperrealism), literature, data analytics and digital technologies to show the connection between semiotics, modern law, and technologies and to justify the need for specific regulation of judge analytics.

The paper is divided into two parts. The first part is devoted to the concept of legal realism, its origins, its leading representatives, and its theses. The second part of the article is directly dedicated to hyperrealism and the technologies underlying it. We look at such a tool as forensic analytics, identifying its strengths and weaknesses and suggesting ways to address them. We also focus on the rationale for the potential of hyperrealism and its possible impact on particular areas of jurisprudence.

2 Realism and Hyperrealism in Arts

The term realism was used for the first time in jurisprudence in 1930 by the American legal realist professor Karl N. Llewellyn in his paper published in the Columbia Law Review entitled *A realistic jurisprudence—The next step* [55]. The term realism came from the arts, and so is this paper's hypothesis which proposes a hyperrealist view of the jurisprudence due to the extensive use of technology as an attempt to predict its outputs.

Realism in arts is the opposite of romanticism (anti-romantic movement) and has as its cradle in France between 1850 and 1880. Realist artists attempt to be more accurate in their models' depictions—the term in art dates from 1826. The

Frenchman Gustave Coubert (1819–1877) was the first artist to claim to practice the realist aesthetic.⁴ He stated that *the essence of realism is the denial of the ideal*.

In Law, before Karl N. Llewellyn, several authors can be regarded as pre-realists for their approach to analyzing legal decisions, for their criticism of legal formalism and the Langdellian educational model (Harvard's case method). In visual arts, for example, before Coubert baptized the realist movement, some predecessors from the seventeenth century, like the Italian painter Caravaggio (1571–1610) and the Spaniards José de Ribera (1591–1652) and Diego Velázquez (1599–1660) already showed realist brush strokes. Legal theory mimicked the arts.

Realism is also present in literature and theatre. The Frenchman Honoré de Balzac (1799–1850) and his attempt to portray French society in his *La Comédie Humaine* (Human Comedy—90 novels published between 1829 and 1847) is known to be the first realistic literature piece [92].⁵

Realism in literature is also present in lusophonic countries like Brazil and Portugal. In Brazil, Rio de Janeiro's writer Machado de Assis is the main representer with his 1881 novel *Memórias Póstumas de Brás Cubas* (The Posthumous Memoirs of Brás Cubas).⁶ In Portugal, we must highlight Antero de Quental (1842–1891) and his first poem *Odes Modernas* (Modern Odes) from 1865.⁷

Hyperrealism is the evolution of realism in arts and was born in the United States as a reaction to Pop Art and to the Minimalist art and Abstract Expressionism Movement in that country.⁸ American painters like Richard Estes (1932 -) and Chuck Close (1940–2021) were the first to adopt the style. The term hyperrealism came up in 1973 from the Belgian art dealer Isy Brachot who named one of her photorealism exhibitions *L'hyperréalisme*.⁹ The Chinese painter Leng Jun (1963 -) is one of the most known hyperrealist artists.

Hyperrealism takes the following step of realism because it enhances reality taking the masterpiece beyond photographic quality. It is realism in full HD and with infinite pixels. The hyperreal can be defined as *the indiscernibility between the real and the illusory* [89, pp. 436–437]. It turns reality into an illusion and uses technology and photographic advancements. Hyperrealism is an advancement of photorealism, albeit the artists still use traditional tools (e.g., paint, clay, and graphite).¹⁰ Hyperrealist artists use photographs as references. Still, unlikely Photorealist artists who try to recreate an image, hyperrealists create a false reality in high resolution. Digital art is used to generate hyperrealist sketches and paintings. The artists use digital illustration techniques or digitally modified images to transfer them onto canvases or molds.

As realism had the pre-realism artists, hyperrealism has realism as its predecessor. Hyperrealism intertwines technology and arts, and as artistic realism proved to

⁴ On Coubert's Realism see Fried [32].

⁵ On Honoré de Balzac see Umbach et al. [86].

⁶ About Machado de Assis see Machado [60].

⁷ About Antero de Quental see: Casemiro and Rodrigues [13].

⁸ See <https://artincontext.org/hyperrealism-art/>. Accessed 28 January 2023.

⁹ See <https://www.plusonegallery.com/blog/28/>. Accessed 28 January 2023.

¹⁰ See <https://artincontext.org/hyperrealism-art/>. Accessed 28 January 2023.

apply to legal theory in the first half of the twentieth Century both in the United States and Scandinavia, hyperrealism is the twenty-first Century tendency by the ever-growing use of technology to analyze jurisprudence. Artists have sharp minds and cunning eyes to forecast social changes and developments, showing us trends years before everyone realizes they were right.

3 Legal Realism Doctrine

3.1 General Outline

Both American and Scandinavian legal realism were early 20th legal theory movements. American legal realism began with Karl N. Llewellyn (1893–1962), a law professor that taught at Yale Law School, at Columbia Law School for most of his career, and finally at the University of Chicago Law School. Conversely, Scandinavian legal realism started with the Swedish philosopher Axel Hägerström (1868–1939) at the University of Uppsala and the Danish jurist Alf Ross (1899–1979) at the University of Copenhagen.

Despite the geographical distance and the different legal backgrounds of its authors, both movements share similarities but do not interact. They both separated law and morality. The starting point is the same: they share a common enemy: legal formalism in legal education and legal theory (legal positivism). In a nutshell, both movements reject traditional legal rules [64, p. 123].

Authors of both realism strains advocate an interdisciplinary approach to the law, which implies the use of sociology, psychology, and other areas in the analysis of jurisprudence and law school curricula.

Moreover, Americans and Scandinavian realists focused on the decision-making process and a predictive account of the law. Therefore, empirical research is essential to predict legal decisions and assess disputes. Studying the legal language of judicial decisions was vital to the analysis. The American realist Jerome Frank defends in *Law and the Modern Mind* (1930) the study of the judges' psychological background to predict their future decisions [31]. Scandinavian Alf Ross' primary concern in *On Law and Justice* (1959) [27, 86] is that the lawyer should seek the rules applied by the courts by empirically analyzing the judicial decisions to unfold every judge's normative ideology. To him, the norm is only valid if it has the possibility of future application [69]. American legal pre-realist Arthur Corbin in *The Law and the Judges* (1914) [18] shares Ross' conception claiming that the trained lawyer should go beyond the rules and know the judge's mind because the judges are the ones who have by and large the most significant influence in the dispute. After all, they are the ones who have the last say. Walter W. Cook [14, 15], Underhill Moore [71, p. 136],¹¹ and others [94] showed their great interest in empirical research applied to the law, just like Alf Ross.

¹¹ See also Schlegel [77].

American legal realists wanted to reform the law and establish its foundations in empirical science. In contrast, Scandinavians' approach was philosophical about the law's nature and the system of legal norms through an antimetaphysical bias.

This paper addresses the lawyer's attempt to predict the judge's decisions and an empirical approach as the means to this end, focusing on American legal realists. As an evolution of legal realism, we should address, just like in arts, a hyperrealist legal theory, that is, empirical research to aid judicial decision's prediction enhanced using the available technologies. Thus, this paper focuses on the realistic empirical approach and, more specifically, the digital tools applied to achieve this goal in the twenty-first Century. We chose to restrict the analysis to American legal realism due to its more vigorous defense of the empirical approach, its non-philosophical starting point (unlike the Scandinavians), and its beneficial influence on American legal education. Karl N. Llewellyn, the only American realist author who commented on Scandinavian legal realism, claimed that the Scandinavians were conducting a philosophical inquiry into the nature of law. At the same time, the Americans attempted to develop legal technology [64, p. 125].¹² Our research problem here is practical, not philosophical. Therefore, we are advocating hyperrealism as an evolution of American legal realism, not Scandinavian legal realism.

3.2 American Legal Realism

American legal history is divided into three ages: The Age of Discovery (1787–1865—from the American Constitution until the Civil War), the Age of Faith (1865–1918—from the Civil War until the I WW), and the Age of Anxiety (from 1918 until current days) [35].¹³ In 1870 Christopher Columbus Langdell became the first dean of the Harvard Law School, and with his idea of *Law as a science and of the library as a lab to the Law professional* he started the age of faith. Faith in the Law as a science and the Harvard Law educational model (the case method) got spread all over the country by the young Harvard Law School assistant professor James Barr Ames [84, p. 55]. The case method was allegedly scientific and somewhat Darwinian. If used with consistency, it would provide certainty in legal rules, making *stare decisis* more and more accurate. The case method also created the survival of the fittest in law school classrooms. Thus, the Age of Faith stands for faith in Law as a science, in the case method, and the spartan legal education [43, 44, 46, 93].

Langdell's version of the case method was based on some premises, such as a thorough study of legal rules and constant and disciplined participation in class (Socratic method). In the hands of a trained professor, it kept the competitive atmosphere of the law school. It also meant the development of legal skills such as legal analysis and reasoning, not the dry learning of legal rules as it used to be preached [90, p. 13]. In 1902, twelve of the ninety-two law schools adopted the case method. That number increased to thirty in 1907. After all, the case method had an

¹² See also Leiter [49].

¹³ See also Horwitz [42].

unbeatable feature: it allowed a large number of students in each class, which meant profit to the law schools [90, p. 64].

So, due to the case method, there was endemic formalism in law schools. Still, this formalism was also present in the courts due to the great reverence for *laissez-faire*.¹⁴ [21, pp. 11–25] This formalist combination served as fuel for the appearance of legal realism, a critical legal movement to formalism in legal theory and legal education.

Oliver Wendel Holmes criticized the scientific formalism in the Law in *The Common Law* [40]. He believed that the Law should correspond to the *feelings and demands of the community* showing a social concern in his view as the opposite of purely scientific. Holmes was Langdell's counterpoint at that time. Some authors consider Holmes a pseudo-realist with ambiguous character in his theory [20, pp. 32–33]. Well, he indeed is one of the many inspirations for the realist movement, for he attacked Langdell's formalism in the law schools and *laissez-faire* in courts.

Three other authors can be labeled as pre-realists: Wesley N. Hohfeld (1879–1918), Joseph Bingham (1878–1973), and Arthur Corbin (1874–1967).

Bingham published his paper *What is the Law?* in 1912 [8] a true genuine realism statement that later influenced Karl N. Llewellyn and Walter W. Cook. Bingham makes a ferocious critique of the Law perceived as a science. He considers studying external phenomena necessary to determine causes and effects and acquire a skill to forecast judicial decisions [49]. To him, the field of Law is a *science of government*, and the lawyer cannot be restricted to the investigation of primary rules, principles, and definitions [8, p. 9].

Hohfeld published in 1914, *A Vital School of Jurisprudence and Law: Have American Universities awakened to the enlarged opportunities and responsibilities of the present Day?*, a paper addressed to the American Association of Law Schools (AALS). There he criticized the law school curricula affirming that the case method needed revision for the new legal professional. He also suggested a more elaborated curriculum focused on clinical legal studies, more interdisciplinarity, and legal education to other professions [41]. Conversely, Hohfeld agreed that Law was a science by considering his scientific attempt in analyzing judicial decisions and reducing each legal problem to eight possible legal relations (jural opposites and jural correlatives) that he named *fundamental legal conceptions* [11, 40].¹⁵

Arthur Corbin (1874–1967), in *The Law and the Judges* [18] attempts to unfold the role of the judge in society and considers him a lawmaker with a strategic advantage over others because the judges have the last word in any dispute, and this decision will be complied by at least one person when enforced [17]. To him, a good judge would have the skill to update the precedent rules to the current case. The growth of the Law is an evolutionary process. The lawyer should study the judge's mind and its *modus operandi*. In this way, Corbin attacks Langdell's formalism of the case method.

¹⁴ See examples of *laissez-faire* in caselaw: *Allgeyer v. State of Louisiana* (1897); *Lochner v. New York* (1905) e *Coppage v. Kansas* (1915).

¹⁵ See also Ferreira [23].

Walter Wheeler Cook (1873–1943) Cook highlighted the importance of empirical research in the study of Law [14–16, 24, 25]. His focus was to study the courts' behavior, which should be the lawyers' and legal professionals' primary concern [14]. Thus, Cook points out the insufficiency of Langdell's case method in legal education and regards the principles and rules as valuable tools that should not be used mechanically as Langdell professed.

In 1926, Johns Hopkins University's third President, Frank J. Goodnow (1859–1939), invited Cook to establish the Institute for the Study of Law at Johns Hopkins University [1]. Cook had the help of three other professors, namely: Leon C. Marshall (1879–1966), Herman Oliphant (1884–1939), and Hessel Yntema (1891–1966). The four had never practiced law before. Marshall was an economist with no legal qualifications, but they all regarded scientific research as necessary to intertwine law and social sciences and as a precondition for legal institutions' progress.

The Institute had two major concerns: the study of the human factor in applying the law and objective, experimental and realist empirical research. Therefore, Cook started to collect data from two courts (Maryland and Ohio) to reach conclusions about the decision-making process. The tool for that was the application of surveys [81].

Nevertheless, after the 1929 recession and the lack of a solid academic program (each professor wanted to perform independent research), the Institute for the Study of Law closed its doors in February of 1933, and no substantial conclusions came out from the empirical research applied for it was simply too expensive and too slow. The Institute's commitment was to study the Law in action scientifically and not the Law in the books like Langdell preached. Nevertheless, fast results were impossible to attain without technology. Thus, the *unhurried study of the fundamental rules of Law and the manner of their functioning with the object of aiding the better adaptation of Law to social needs* [5, p. 312] through empirical research failed due to financial impossibilities and the lack of proper research tools.

There is no denying that Karl N. Llewellyn (1893–1962) is the most prominent American legal realism scholar. In his 1930 paper, *A realistic jurisprudence—The next step*, he labels the movement that was already implicit since Oliver W. Holmes [42] and Benjamin Cardozo (1870–1938) [12] and in some ways explicit since Bingham's 1912 paper [8] and Corbin's paper from 1914 [18]. Llewellyn's great merit is realizing the ongoing criticism of Langdell's formalism as a legal theory and a legal education method. Nevertheless, Llewellyn dedicates the first part to criticizing Roscoe Pound's (1870–1964) book *Law and Morals* from 1924 [77]. The only interesting discussion in this paper regarding realist doctrine is the differentiation between real rules (the practices of the courts. What the court will do in each case) and paper rules (the accepted doctrine of the time and place) [55, p. 448]. A realistic understanding of Llewellyn is only possible by the observation of behaviors. He qualifies law as an engine (a heterogenous multitude of engines) with values and purposes. Therefore, there should be an ever-increasing emphasis on observable behavior (judge's behavior) and an ever-decreasing emphasis on words (judicial decisions). [55, p. 464] Llewellyn ratifies the criticism of legal positivism as he acknowledges judges' freedom to apply or reject statutes and precedents [85].

Roscoe Pound replies to Llewellyn in his Harvard Law Review 1931 paper *The call for a realist jurisprudence* [76] criticizing two main issues of the realism movement: the realist's persistence in applying empirical research and the use of psychology to analyze the judge's behavior.

After Pound's criticism, Llewellyn feels the need to name the realist scholars, and in his 1931 Harvard Law Review paper *Some Realism about realism—Responding to Dean Pound* [56]. So, along with Jerome Frank, he elaborates a list of twenty men that, from his point of view, would have realistic features [56]. The criteria for being on the list were the following: 1. Young law professors; 2. Use of empirical research through data gathering. 3. Interest in the psychology of rationalization; 4. Interest in the functionality of the law; 5. Recognition of the irrational elements in the judge's behavior [90, p. 75]. In a nutshell, Llewellyn listed authors that pursued a realist methodology by using social sciences and that were open to social science data to reach legal outputs.

In three other writings, Karl N. Llewellyn criticizes Langdell's case method and legal education in that period: *The Bramble Bush* (1930) [59], *On What is Wrong with So-Called Legal Education* (1935) [57] and *The Place of Skills in Legal Education* (1945) [58].

American legal realism is a double-faced movement: a criticism of the Law as a science and an objection to legal education with this Langdellian formalist foundation.

Realists advocated that legal education should give more practical experience to students and that interdisciplinary courses were necessary. They successfully increased the number of elective classes [84, p. 241], even at Harvard Law School.

Due to growing totalitarianism in Europe after 1936, the progressist legal perspective of the realists started to be seen as a menace to democracy [79, p. 437]. The Langdellian traditionalists would prevail as realism was never a solid legal movement with clear adepts.

Nevertheless, the movement had a significant influence in law schools in the Critical Legal Studies movement of the seventies with the creation of the *Conference on Critical Legal Studies* [91].

In short, these would be the most notable contributions of the realistic movement to legal education and legal research:

- Interdisciplinarity (especially the integration of Law with sociology)
- proliferation of elective courses
- adoption of legal practice clinics
- application of empirical research to Law
- Improvement in teaching material (case books)
- progress of teaching techniques

At the time, realists lacked the digital tools to reach the desired results by using empirical research applied to Law.

4 The Concept of Hyperrealism in the Age of Digital (Un)Certainty

One reason for legal realism failure was the need for more affordable tools, which could prove that scholars were right. In hyperrealistic times the situation has changed [47]. The advance of technologies [38] made it possible to resume discussions on legal realism. Speaking the language of artists, we can say that technologies can be the tools that help to make the picture of the court hyperreal.

It became possible because currently available tools can analyze and predict behaviors. For instance, Fujitsu's Actlyzer can "understand people and predict what a person will do next through merging sensor data and insight from the humanities and social science."¹⁶

Specific tools to predict judicial decisions by analyzing the judge's behavior have been introduced previously. Thus, there is a technology based on Natural Language Processing (NLP) aimed at predicting the outcomes of the cases of the European Court of Human Rights (ECHtR) [2]. Research made on the base of this technology showed intriguing results. Decisions of the ECHtR on whether there was or not a human rights violation is influenced by the judge's presence or absence in the hearing room [67].

So, developing Gilmore's idea of the ages of American legal history, it is reasonable to state that we live in the age of global-scale digitalization [35].¹⁷ Undoubtedly, data and technologies that can process it became *the oil of the future society* [53] and drivers for economic and social development.

So, are we living in the age of digital certainty or uncertainty? What makes us certain is that technologies are already integrated into our lives. We realize we are moving towards a digital future where technologies will play a much more crucial role [26, 73].

Uncertainty is closely connected with the question if technology advancement can indeed influence humankind positively. Technologies can significantly improve our well-being and living conditions. Moreover, the potential of mentioned technologies is significant, and the possibilities of their use are almost limitless. On the other hand, we realized that technology could be a real threat if we will not find a way to tame it. Threats to human rights, state interests and security, cultural heritage and sustainability are the primary concerns.

5 Judge Analytics as Hyperrealism's Primary Tool

Analysis of the current state of technological development showed that the sphere of justice uses technologies. Databases such as LexisNexis or JusMundi gathered vast amounts of necessary information such as current legislation, cases, relevant publications, decision-makers profiles etc. Assistant programs such as Electronic Filing System (EFS), Case Management System (CMS), Court Recording and

¹⁶ See Actlyzer. <https://www.fujitsu.com/global/about/research/technology/actlyzer/> Accessed 28 January 2023.

¹⁷ About the digital age, see Kapczynski [45].

Transcribing (CRT), Queue Management System (QMS), and internet streaming aimed to promote e-justice, automate and speed up decision-making in this area.

Data analytics plays a crucial role in modern justice. It is based on the discovery and processing of Big Data. Algorithms can analyze the data on cases on a party's legal history in the justice system. [2] By using modern technologies, we can uncover unexpected relationships, patterns and categories [9]. Different kinds of analytics allow for processing Big Data depending on specific goals. Thus, we will use descriptive analytics if we need to gather and organize data. Higher-level analytics (prescriptive) offers recommendations on future courses of action. Finally, predictive analytics can use data to predict future courses of action. Predictive decision-making is used to forecast future court decisions by training the system through the input of precedents [66]. Thus, JuriSays predicts decisions of European Court for Human Rights.¹⁸

Data analytics in justice can be subdivided into two groups, depending on the data and the analysis focus (who or what).

Court analytics plays a crucial part in modern justice. It uses technologies to analyze different aspects of judicial proceedings [50, 70].

Judge analytics represents a particular and most discussable part of court analytics. Experts explain judge analytics as a tool capable of detecting patterns in a specific judge's rulings, the arguments they are most receptive to, the language they use, and so on [50]. All this information enables these systems to predict the possible outcome of cases, compare different judges, mitigate the risk of litigation, and devise a winning strategy [19].

The growing popularity of judge analytics or, as researchers name it—"mainstreamed analytics"—can be explained by the fact that litigants can achieve better results when they know more about the particular judge adjudicating their case [65].

Existing judge analytics tools such as Context by LexisNexis, Supralegem.fr, Westlaw Edge, Litigation Analytics, Jurimetry and Predictice [3] can provide the following data (as its developers claim it): (a) the language, precedents and other judges that a particular judge finds the most compelling; (b) the "specific logic" that a judge tends to use when granting or denying a particular type of motion; (c) how likely a user's case is to prevail before a particular judge; (d) how long a particular judge takes to decide a particular type of motion; (e) how a particular judge tends to rule on a particular type of case, like a summary judgment motion; (f) how often a decision is confirmed or reversed (in whole or in part) on appeal; (g) outcome analysis by gender and race; (h) comparative function (statistics on a judge in comparison with other judges or a court average).¹⁹

¹⁸ JURI reads published documents from previous years and decisions of the cases judged by the European Court of Human Rights and predicts decisions the Court will make, available: <https://jurisays.com/>. Accessed 28 January 2023.

¹⁹ See: Context Judge Analytics (LexisNexis). <https://www.lexisnexis.ca/pdf/2021/Context-Getting-Started-EN.pdf>. Accessed 28 January 2023; Premonition Analytics. <https://premonition.ai/about-us/>. Accessed 28 January 2023; Bloomberg Law's Comparative Analytics tool. <https://pro.bloomberglaw.com/legal-analytics/>. Accessed 28 January 2023; Evaluate your judge (Thompson Reuters Litigation

Similar tools are applied in arbitration [10, 28], though this type of analytics is less developed than judge analytics. Thus, as it is claimed, GAR's Arbitrator Research Tool (ART) helps to find potential arbitrators by tracking specialist knowledge, experience, and work relationships and combining it with relevant documents and stories.²⁰ Such tools as Jus Mundi Conflict Checker helps to find out if the arbitrator has any potential conflict of interests.²¹ Wolters Kluwer Arbitration launched Profile Navigator and Relationship Indicator the tool can assist in the selection of an arbitrator and the investigation of potential conflicts of interest of arbitrators and stakeholders involved in the case, such as expert witnesses and counsels. The tools also provide links to their awards and publications for a complete assessment of the arbitrator's profile.²²

Researchers pointed out the following features of judge analytics to assist lawyers and parties:

- 1) it can highlight trends, arguments or the preferred language;
- 2) it shows patterns in the types of questions asked by a particular judge;
- 3) it makes possible "judge shopping" – an attempt to have a case heard or not heard by a particular judge [64];
- 4) it allows learning more about judicial decision-making by looking at how each judge performs tasks;
- 5) it contributes to transparency and trust in the judicial system;
- 6) information about judges become easier accessible, thus bridging the knowledge gaps among the social groups. [54]

Judge analytics proves that realists were correct in the early twentieth century and can help to create a hyperreal image of the contemporary court and judge. Therefore, judge analytics is the only tool that analyzes the behavior of judges (not legislation or caselaw). The tool justifies a legal hyperrealism theory.

5.1 Judge Analytics: Vulnerabilities and Ways to Overcome

At the same time, despite all mentioned advantages and potential that judge analytics has, it represents the most controversial tool among existing ones in the sphere of justice. Unlike court analytics, judge analytics focus on the judges and their behavior. Thus, the problem emerges when we consider the judge's right to privacy and confidentiality and the parties' rights to an impartial judge.

Footnote 19 (Continued)

Analytics). <https://legal.thomsonreuters.com/en/products/westlaw-edge/litigation-analytics> Accessed 28 January 2023; Predictice. <https://predictice.com/fr>. Accessed 28 January 2023; TCC Jurimetria. <https://gitters.com/jurimetry?ysclid=ldk8dp9c3j655957234> Accessed 28 January 2023.

²⁰ See Arbitrator Research Tool, available: <https://globalarbitrationreview.com/tools/arbitrator-research-tool>. Accessed 28 January 2023.

²¹ See Conflict Checker. <https://jusmundi.com/en/conflict-checker>. Accessed 28 January 2023.

²² See Arbitrator Practice Plus, available: <https://www.wolterskluwer.com/en/solutions/kluwerarbitrati/on/practiceplus> Accessed 28 January 2023.

The SupraLegem tool example gives us a clear picture of these challenges. Designed by a former Deloitte French tax lawyer, it was able to detect judicial rejection rates in some case categories [7].

This tool can analyze massive amounts of jurisprudence to extract a synthetic and unpublished vision. It uses algorithms to read texts, learn from them, and answer uncountable questions. If the answer is incorrect, the algorithm updates itself, avoiding future similar errors. This procedure repeats itself a hundred times to achieve maximum accuracy. The accuracy rate is between 90 and 99%, depending on the extracted field. Judicial Decisions dealing with specific legal topics are selected and aggregated to calculate statistics by judge or court. This algorithm makes it possible to compare, for example, the judge's rejection rate in each legal matter.²³

A report issued by SupreLegem concluded that the judicial expulsion measure (an obligation to leave the country) depended on the judge who ruled the case: "Some judges had a very high asylum rejection ratio (close to 100%, with hundreds of cases per year), while others from the same court had a low ratio". Notably, American scholars reached similar conclusions. They discovered that female judges adjudicated asylum 44% times more than male judges. Thus, whether asylum is granted or rejected depends somewhat on the judge's genre [82]. On the one hand, the US research led to no consequences. On the other hand, the report based on SupraLegem.fr analytics led to the tool's banishment in France.

Thus, article 33 of the Law 2019–222 (Loi n. 2019–222) establishes that: "The identity data of judges and members of the registry may not be reused for the purpose or effect of evaluating, analyzing, comparing or predicting their actual or assumed professional practices".²⁴

French judges did not consider their decision's algorithmic analysis and full disclosure beneficial. They did not want society to access their decision patterns and, what is more, personal behavior. Therefore, the new law aimed to prevent anyone from publicly revealing the pattern of judges' behavior concerning court decisions.²⁵ The law established a maximum penalty of five years in prison for rule breakers.

Though scholars disagree with this decision, they also acknowledge vulnerabilities in judge analytics' tools:

- (1) Datasets limitations. It means that not all judicial behavior is recorded and not all court records are made available in digital format.

²³ The impartiality of some French judges was undermined by machine learning. <https://medium.com/@supralegem/the-impartiality-of-some-judges-undermined-by-artificial-intelligence-c54cac85c4c4>. Accessed 28 January 2023.

²⁴ LOI n° 2019–222 du 23 mars 2019 de programmation 2018–2022 et de réforme pour la justice (1), 24 March 2019, Article 33, France Bans Judge Analytics, 5 Years In Prison For Rule Breakers. https://www.legifrance.gouv.fr/jorf/article_jo/ Accessed 28 January 2023; See also <https://www.artificiallawyer.com/2019/06/04/france-bans-judge-analytics-5-years-in-prison-for-rule-breakers/>. Accessed 28 January 2023.

²⁵ France Bans Judges' Decision Analytics, 5 Years in Prison For Rule Breakers. <https://www.thelibertybeacon.com/france-bans-judges-decision-analytics-5-years-in-prison-for-rule-breakers/>. Accessed 28 January 2023.

- (2) The possibility of hacking the program and influencing algorithm work. This vulnerability is sufficient due to the fast growth of technology that can be used for illegal purposes, including hacking

We can also point out the following vulnerabilities of judge analytics, that is, the data “quality.” Most modern judge analytics tools are AI-based, which also raises several concerns. The main problem here is that algorithms can be biased since data uploaded to train the technology can be based on human biases (what so-called “garbage in–garbage out principle”) [39, 80, 83].

Despite all the benefits that AI can bring to make justice more fair, professional and fast, it is widespread in this area and poses some risks and threats. Also, global AI input to justice is another concern. Therefore, AI is being actively used not just as a tool of judge analytics or predictive justice technology. AI tools are applied to manage cases, operate the hearings, and gather and evaluate evidence. So, it means that judges are working with “AI-based products” during their whole work cycle. Hence, AI may also influence judicial outputs and becomes a factor included in the patterns that “predict” their rulings.

Conversely, we cannot support the judge analytics ban. Despite the vulnerabilities, this tool has great potential. It can improve the justice system and pressure judges to become more thoughtful about their attitudes and decision-making process. Though of course we understand that just simple use of judge analytic tools will not help to make judges bias-free, which is hardly possible. But this can be applied as a part of a system of measures aimed to improve judicial decision-making and make it fairer and more professional. Further, if (when) human judges will be replaced with AI or will have AI-assistant, this AI Judge will make the decisions based on previous improved and more neutral judgements.

It is noteworthy to mention, that this ban had led to stifling of the new field of LegalTech in France, that also cannot be considered positively.

But we should never forget that *technologies are not centric* [74]. To apply judge analytics, we should work thoroughly on this tool’s quality and design trustworthiness. Since judicial decision-making is in the public arena and judges have high professional and social status, judge analytics tools must be subject to governmental control.

First, the competent authorities and judicial community must examine and approve judge analytics. Each country must establish a procedure for verifying and certifying such programs.

Secondly, we recommend designing a standard for judge data analytics. This standard is also helpful for other decision-makers, such as arbitrators.

Thirdly, we advise implementing ethical principles [29, 30, 34] because digitalization has become a legal challenge. Ethical rules on the use of judge analytics and other technology-based tools capable of influencing judge reputation can be implemented into the current legislation, for instance, to the laws on the status of judges or to the codes of judges’ ethics. The cornerstone ethical principles should be human-centered values, fairness, privacy protection and security, reliability, transparency and explainability, contestability, and accountability [87].

6 Impact of Hyperrealism: Taking a HD Picture of Contemporary Law

We attempted to prove that the concept of hyperrealism is present. Modern technologies such as judge analytics show that personal attitudes and bias influence decision-making. This new concept might have implications.

6.1 Hyperrealism, and Legal Decision-making

And cutting-edge tools allow us to highlight the difference between modern hyperrealism and legal realism. If the latter has a narrow application sphere, hyperrealism applies to legal decision-making from a broader perspective.

6.2 Hyperrealism and Judges' Replacement

The concept of hyperrealism showed that the judge's personality plays a relevant role in decision-making. Does it mean that judges should be replaced by technology? Our answer is still no. AI and other technologies can assist the judge in resolving disputes and support legal decision-making. This Artificial Legal Intelligence can be considered just a system that can render expert legal advice or decision-making [87]. Still, the human judge remains a crucial figure in justice. A myriad of factors impacts judicial decision-making. The Australian Law Reform Commission has noted that such factors include induction and intuition, as well as the capacity to assess the social impact of decisions.²⁶

The discussion on impartiality and lack of neutrality of AI algorithms is noteworthy. Like human judges, technology also has biases [1, 6, 22]. Biases are listed among other sufficient limitations and risks of AI models because all AI models operate by processing volumes of historical data, organizing them by rules and using labels often provided by humans, and so contain some element of bias.²⁷ Because AI inputs come from unfiltered open data sources, the developers are unable to avoid "bias problems" ranging from derogatory language, racial discrimination, and violent depictions to gender stereotyping in AI models [37, 45, 48, 72, 83, 88].

That is why it is too early to replace judges with AI or other technologies. And in this case, the concept of hyperrealism and the use and regulation of technologies to make legal decision-making more transparent and accurate will help solve this replacement problem.

6.3 Hyperrealism, Jurimetrics, and Computational Law: New Life for Old Methods

The concept of hyperrealism in the future can significantly impact the development and dissemination of the ideas of computational law and jurimetrics. Although these

²⁶ See Legal Services Society: Separation, Divorce & Family Matters. 2018; MyLawBC, <http://mylawbc.com/paths/family/>. Accessed: 28 January 2023.

²⁷ Artificial Intelligence and the Court, https://www.aas.org/sites/default/files/2022-09/Paper%201_AI%20Foundational%20Issues_NIST_FINAL.pdf Accessed 28 April 2023.

directions have existed for a long time (e.g., the term *jurimetrics* was coined by Lee Loevinger in 1949) [61], they are just now getting widespread in jurisprudence (e.g., Brazil has established the Brazilian Association of Jurimetrics—ABJ in 2011, and several legal techs are putting their efforts in judicial analytics).²⁸ At the same time, scholars substantiate the potential application of these scientific directions. For example, experts dissertate about the ever-important role that quantum technologies can play in developing computational law (quantum computing law). Current technologies can substantially increase the efficiency of methods used in *jurimetrics* and computational law [4].

Highlighting some *jurimetrics* experiences worldwide is essential to demonstrate the current trend. In Australia, a startup named Tracxn Technologies Ltd. claims to *analyze legal and regulatory decisions for effective understand of legal and government risk*.²⁹ In the US, a startup called Relativity offers software (Relativity One) that promises to help law firms and companies *to amplify the efforts with AI, keep the sensitive data safe, and maximize productivity with integrated capabilities*.³⁰ The software offers early case assessment to companies to *gain insights, analyze risk, and reduce costs*. Nevertheless, more prominent, and renowned American companies such as Westlaw and LexisNexis offer *jurimetrics* services already cited.

In Ireland, the platform Siren offers data analysis with AI use. The Siren Investigate (the platform user interface) promises to blend in a coherent fashion full-text search, business intelligence and scientific visualizations, relational set-to-set navigation, link analysis and geo/temporal analysis.³¹ In the company's case studies website section, they demonstrate, for example, how the platform (Siren Investigative Intelligence Platform) helped to assess disconnected data in criminal investigations by running a data (forensics data, RMS, CAD and multiple databases (arrest warrants, missing persons, traffic offenses etc.) consolidation process.

In Russia, the platform "Jetlex" offers automation of standard legal processes through machine learning. This LegalTech solution, based on the analysis of more than four million real legal cases, allows to automate human work and even replaces it with specific tasks. The primary technological process is the discovery of the accumulated marked-up data sets of knowledge necessary to make decisions in crucial issues of legal practice. To collect and process these data, a "voice-to-text" module is applied, based on the studied end-to-end voice recognition technology concerning Russian spelling and morphology (language model)—and built on convolutional neural networks and on an extended training set optimized for the telephone line.³²

Chinese big lawtech company Wusong's interactive expert system FaXiaoTao can perform case analysis based on precedents and regulations and recommend lawyers.

²⁸ See Associação Brasileira de Jurimetria. <https://abj.org.br/>. Accessed 28 January 2023.

²⁹ See Tracxn. https://tracxn.com/d/companies/jurimetrics/_l6-xrgnv1OPbFHPz0dkkzbZiM86xjaxZI63A64akzFU. Accessed 28 April 2023.

³⁰ See Relativity. <https://relativity.com/ediscovery-software/relativityone/>. Accessed 28 April 2023.

³¹ See Siren. <https://siren.io/platform-overview/>. Accessed 28 April 2023.

³² JetLex AI, <http://jetlex.ai/>. Accessed 28 April 2023.

Another platform, Legal Miner, focuses on litigation analytics and provides track records of enterprises, lawyers and judges in litigation.³³

Therefore, we can affirm that jurimetrics is a reality worldwide. Companies and law firms increasingly seek data analysis to help make decisions and establish business and legal strategies.

7 Conclusion

The development and proliferation of digital technology have transformed the way of life. Digitalization became the new fuel for the development of old concepts. Judge analytics is the proof that courts and judges are not only submitted to social scrutiny but also to a thorough logarithmic digital scrutiny which raises concerns and creates regulatory challenges. Therefore, digital technology is the primary tool of hyperrealism, which sheds new light on legal realism premises and confirms that, in some way, they were right in their empirical approach. The main challenge is to "curb" such technologies. It implies creating mechanisms that will allow such technologies to be applied effectively and ethically for humankind's benefit and not to the detriment of fundamental rights and values. In this sense, hyperrealism, which uses digital technologies to enhance the "quality" of law, clearly deserves attention and requires further comprehensive, systemic, interdisciplinary research. This article substantiates the hyperrealism concept and may form a basis for further investigation.

Defined vulnerabilities of the AI-based judge analytic tools and recommendations for improvement can help design proper regulations on using AI-based analytical tools worldwide. Lawmakers should observe these recommendations internationally and for other countries to develop clear and trustworthy rules.

This study has contributed to the limited available literature on judge analytics and the use of AI to analyze judges' behavior. This research is also substantial for regulators and policymakers as they still determine AI outcomes. Our findings help to understand and create better regulations for AI-based analytical tools from risk minimizing perspective. Moreover, the results achieved in this research article are helpful for further research to promote trustworthy technologies and Artificial Intelligence based on respect for human rights in the digital transformation era.

This research holds limitations as the data collected resulted in reviewing the limited literature related to judge analytics. However, we recommend future research by studying the policy and experience of using AI-based analytical tools from a broader range of countries. That is meaningful because each country has its legal system, traditions and regulatory approaches.

Based on the achieved results, the authors plan to continue the research, focusing on confirming the idea of hyperrealism and creating effective models for regulating hyperrealistic tools.

³³ The Rise of China's Advanced Legal Tech Scene, <https://www.artificiallawyer.com/2017/03/29/the-rise-of-chinas-advanced-legal-tech-scene/>

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