

La decisione nel prisma dell'intelligenza artificiale

a cura di
ERMANNINO CALZOLAIO

Copia uso Open Access

ERMANN0 CALZOLAIO (a cura di), *La decisione nel prisma dell'intelligenza artificiale*

Copia uso Open Access

LA DECISIONE NEL PRISMA DELL'INTELLIGENZA ARTIFICIALE

a cura di
ERMANNOCALZOLAIO

La presente pubblicazione è finanziata dal Dipartimento di Giurisprudenza dell'Università di Macerata nell'ambito della ricerca "Decision and New Technologies" (DANT), che costituisce una delle iniziative di implementazione del progetto "Dipartimento di Eccellenza", finanziato dal MIUR, il cui tema generale è "Diritto e Innovazione: Europa e Cina di fronte alle sfide della globalizzazione"

Come da accordi con il Dipartimento di Giurisprudenza dell'Università di Macerata, questa copia è concessa dall'Editore per la pubblicazione *Open Access* nell'archivio dell'Università degli Studi di Macerata, nonché su altri archivi istituzionali e di ricerca scientifica ad accesso aperto.

Copia uso Open Access

Copyright 2020 Wolters Kluwer Italia S.r.l.
Via dei Missaglia n. 97 - Edificio B3 - 20142 Milano

I diritti di traduzione, di memorizzazione elettronica, di riproduzione e di adattamento totale o parziale, con qualsiasi mezzo (compresi i microfilm e le copie fotostatiche), sono riservati per tutti i Paesi.

Le fotocopie per uso personale del lettore possono essere effettuate nei limiti del 15% di ciascun volume/fascicolo di periodico dietro pagamento alla SIAE del compenso previsto dall'art. 68, commi 4 e 5, della legge 22 aprile 1941, n. 633. Le riproduzioni diverse da quelle sopra indicate (per uso non personale - cioè, a titolo esemplificativo, commerciale, economico o professionale - e/o oltre il limite del 15%) potranno avvenire solo a seguito di specifica autorizzazione rilasciata da EDISER Srl, società di servizi dell'Associazione Italiana Editori, attraverso il marchio CLEARedi Centro Licenze e Autorizzazioni Riproduzioni Editoriali. Informazioni: www.clearedi.org.

L'elaborazione dei testi, anche se curata con scrupolosa attenzione, non può comportare specifiche responsabilità per eventuali involontari errori o inesattezze.

INDICE

Autori.....	XI
-------------	----

INTELLIGENZA ARTIFICIALE ED AUTONOMIA DELLA DECISIONE: PROBLEMI E SFIDE

Ermanno Calzolaio

1. Spunti introduttivi.....	1
2. Le innovazioni tecnologiche e il diritto.....	3
3. La decisione quale criterio di osservazione del fenomeno.....	5

AI-BASED DECISION SUPPORT SYSTEM: FROM THEORETICAL BACKGROUND TO REAL WORLD APPLICATIONS

Emanuele Frontoni – Marina Paolanti

1. Introduction.....	9
2. Description of real-world applications.....	13
2.1. An Infrastructure for decision-making to support neonatal clinical care and research.....	13
2.2. Decision Support System for assisted reproductive technology.....	16
2.3. Visual and textual sentiment analysis of social media pictures using deep convolutional neural networks.....	17
2.4. Deep understanding of shopper behaviours and interactions using computer vision.....	19
3. Conclusion.....	21

CHI DECIDE? INTELLIGENZA ARTIFICIALE E TRASFORMAZIONI DEL SOGGETTO NELLA RIFLESSIONE FILOSOFICA

Carla Canullo

1. La filosofia moderna, la nascita del soggetto e il sogno della macchina.....	25
---	----

2.	<i>La contrée des philosophes</i>	27
3.	L'apparire inatteso della volontà.....	30
4.	La sfida della libertà.....	32
5.	La libertà della decisione.....	35

THE JUDICIAL DECISION BETWEEN LEGAL GAPS AND
TECHNOLOGICAL INNOVATION: SOME SUGGESTIONS FROM
THE 19TH AND 20TH CENTURIES

Monica Stronati

1.	Artificial intelligence between opportunities and challenges.....	37
2.	The boundaries of liability: from fault-based liability to strict liability and back (to fault-based liability).....	41
3.	Legal certainty, judicial predictability and Justice.....	51

LÉGIFÉRER SUR L'INCONNU.
À PROPOS DES SYSTEMES D'ARMES LÉTAUX AUTONOMES

Nicolas Haupais

1.	Introduction.....	57
2.	Que faire ? Comment légiférer ?.....	61
3.	Les aspects juridiques de l'interdiction/limitation de l'emploi.....	71
4.	La dynamique de l'interdiction: réciprocité et obligations interdépendantes.....	74

LA DÉCISION DU CONTRACTANT AU PRISME DE
L'INTELLIGENCE ARTIFICIELLE

Garance Cattalano

1.	Introduction.....	77
2.	L'automatisation de la décision de conclure le contrat.....	81
	A. Les modalités pratiques.....	81
	B. Les difficultés théoriques.....	82
3.	L'automatisation des décisions pendant l'exécution du contrat.....	85
	A. La simplification.....	85
	B. La rigidification.....	88

LA LÉGITIMITÉ DES DÉCISIONS CONTRACTUELLES
ÉMANANT D'UNE INTELLIGENCE ARTIFICIELLE

Frédéric Dournaux

1.	Introduction.....	91
2.	La prise de décision contractuelle par une intelligence artificielle.....	93
	A. L'intelligence artificielle, aide à la décision contractuelle.....	93
	B. L'intelligence artificielle, acteur de la décision contractuelle.....	95
3.	De quelques questions posées par la prise de décision contractuelle par une intelligence artificielle.....	96
	A. Les insuffisances de la technique.....	97
	B. Les risques relatifs à l'externalisation.....	98
	C. Les réserves d'ordre axiologique.....	99

DRIVERLESS CARS:
I NUOVI CONFINI DELLA RESPONSABILITÀ CIVILE
AUTOMOBILISTICA E PROSPETTIVE DI RIFORMA

Stefano Pollastrelli

1.	Premessa.....	103
2.	Dal conducente al robot. La categoria dei <i>Self Driving Vehicles</i>	107
3.	Il crepuscolo dell'art. 2054 c.c. Verso una nuova visione della responsabilità civile automobilistica.....	109
4.	Considerazioni conclusive.....	116

LA DÉCISION EN DROIT ET CONTENTIEUX
ADMINISTRATIFS FRANÇAIS

Pierre Serrand

1.	Introduction.....	119
2.	La décision en contentieux administratif: l'acte administratif décisoire.....	123
	A. La notion.....	123
	B. Les distinctions.....	126
3.	La décision en droit administratif: l'acte administratif discrétionnaire.....	130
	A. Décision et autorité administrative.....	131
	B. Décision et juridiction administrative.....	134

BIG DATA, DECISIONI AMMINISTRATIVE E “POVERTÀ” DI
RISORSE DELLA PUBBLICA AMMINISTRAZIONE.

Francesco de Leonardis

1.	La prospettiva d’indagine.....	137
2.	Le tre tappe della digitalizzazione, interconnessione e intelligenza artificiale.....	140
3.	I campi di applicazione dell’analisi predittiva.....	144
4.	I vantaggi della “decisione robotica”.....	147
5.	La prima criticità: il diritto alla riservatezza.....	149
6.	La seconda criticità: l’opacità della decisione.....	152
7.	La “povertà” di risorse dell’amministrazione italiana di fronte agli algoritmi.....	156

LA JUSTICE PRÉDICTIVE

Louis Larret-Chahine

1.	Introduction - La réalisation d’une utopie.....	161
2.	Définition de la justice prédictive.....	163
3.	Les bénéfices de la justice prédictive.....	163
	A. Un outil d’aide à la décision pour les profes- sionnels du droit.....	165
	B. Un levier de transparence et de performance du service public de la justice.....	167
4.	Pour une critique constructive de la justice prédicti- ve.....	168
	A. La nécessité d’un choix éthique.....	168
	B. La question de la régulation.....	170
5.	Conclusion – Pour une université #legalgeek.....	172

LAW AS A SET OF DECISIONS.
ON MERITS AND DANGERS OF LEGAL REALISM THROUGH
THE PRISM OF BIG DATA

Wojciech Zagorski

1.	Introduction.....	175
2.	The Triumph of Legal Realism.....	178
3.	The Dangers of Legal Realism.....	181

THE ROLE OF HUMAN JUDGE IN JUDICIAL DECISIONS.
PRELIMINARY REMARKS ON LEGAL INTERPRETATION IN
THE AGE OF ARTIFICIAL INTELLIGENCE.

Laura Vagni

1. The task of judging and the option of an artificial judge.....	185
2. Law and interpretation or law as interpretation.....	191
3. The influence of the human judge on judicial decisions.....	195
4. The role of the judge: a constant tension between human being and being human.....	199

Copia uso Open Access

THE JUDICIAL DECISION BETWEEN LEGAL GAPS AND TECHNOLOGICAL INNOVATION: SOME SUGGESTIONS FROM THE 19TH AND 20TH CENTURIES

Monica Stronati

TABLE OF CONTENTS: 1. Artificial intelligence between opportunities and challenges. – 2. The boundaries of liability: from fault-based liability to strict liability and back (to fault-based liability). – 3. Legal certainty, judicial predictability and Justice.

1. Artificial intelligence between opportunities and challenges.

The interesting and profitable meeting with computer engineers has highlighted that artificial intelligence has created enormous benefits in all areas of human life.

However, new technologies complicate the traditional rules for recognising and attributing possible damage caused by intelligent machines. First of all because the same machine construction may involve multiple skills and each contributor may sometimes participate only for a part without knowing the whole machine and its overall functioning. Moreover, artificial intelligence machines have a self-learning capability necessary to act in complex situations. Therefore, the designers of these machines are not able to predict their actions and, in many respects, are not even able to control them.

Artificial intelligence machines have shifted and confused the boundaries of the decision and there is a liability issue if the action causes damage.

The programmer creates the programmes, or algorithms, through which the machines act. Manufacturers concretely develop machines for their production and diffusion. It is difficult for users to prove that a damage results from such technologies working unexpectedly or abnormally rather than

from negligence or recklessness, in order to obtain compensation for faulty product damage. In such cases, it may be difficult to understand who more rationally is to blame: whether the programmer or the producer (or both, if that is the case) or the user himself.

The problem of assuming liability does not exist in the hypothesis of an illegal use of software or algorithms, because in these cases the subject who will be held responsible for the damage is detectable. The question of liability arises when the artificial intelligence machine itself produces damage.

For this reason, the possibility of creating new ad hoc rules for a new category of "algorithm" civil liability is being considered. In 2016, the European Parliament's Legal Affairs Committee (JURI) submitted a legislative proposal to the European Commission asking for the subjective qualification of the most sophisticated intelligent robots as electronic persons. The Commission should explore

«the implications of all possible legal solutions, such as: creating a specific legal status for robots, so that at least the most sophisticated autonomous robots could be established as having the status of electronic persons with specific rights and obligations, including that of making good any damage they may cause, and applying electronic personality to cases where robots make smart autonomous decisions or otherwise interact with third parties independently»¹.

Here, one of the remarkable elements is the need to regulate liability for damage caused by robots and damage caused by algorithms. The European Union has set the objective of addressing civil liability for damage. In February 2017, the European Parliament adopted a resolution with recommendations concerning civil law standards on robotics. With regard to civil liability, the resolution states that:

«Any chosen legal solution applied to the liability of robots and of artificial intelligence in cases other than those of

¹ <https://www.europarl.europa.eu/doceo/document/JURI-PR-582443_EN.pdf?redirect>.

damage to property should in no way restrict the type or the extent of the damages which may be recovered, nor should it limit the forms of compensation which may be offered to the aggrieved party on the sole grounds that damage is caused by a non-human agent.

The future legislative instrument should be based on an in-depth evaluation by the Commission defining whether the strict liability or the risk management approach should be applied. A compulsory insurance scheme, which could be based on the obligation of the producer to take out insurance for the autonomous robots it produces, should be established.

The insurance system should be supplemented by a fund in order to ensure that damages can be compensated for in cases where no insurance cover exists.

Any policy decision on the civil liability rules applicable to robots and artificial intelligence should be taken with due consultation of a European-wide research and development project dedicated to robotics and neuroscience, with scientists and experts able to assess all related risks and consequences»².

Actually, the issue arises at a global level, since the development of artificial intelligence technology is happening at a global level, and the monitoring of possible harmful effects must be performed at that same level. Possible risks no longer have geographical boundaries, so solutions adopted by the EU should be shared at least by the US and China.

The liability system established in the USA differs from the English one, even if they come from the same starting point. In the USA, the tort of negligence is greater and more incisive. Indeed, in the USA, the concept is that the cause of the tort is only an objective violation of behaviour. The injured party must prove the negligence. However, there is an alleged violation of the standard of diligence when the harmful event would not usually occur if behaviour were diligent.

This mechanism benefits the position of the injured party whose burden of proof will be significantly lightened by

² <https://www.europarl.europa.eu/doceo/document/TA-8-2017-0051_EN.html#title1>.

simply having to prove that there has been misconduct at regulatory level.

The US liability system differs from all damage compensation systems. Generally, the offender's sentence to compensation aims at restoring the *status quo ante* through its monetary equivalent, while US law also aims to "punish" the offender. Therefore, the damage compensation pursues the double purpose of special and general (exemplary) deterrence.

China, currently engaged in the codification of civil law, in 2010 promulgated the law on "Non-contractual Liability"³. The 2010 law is a well-balanced ensemble of legal elements deriving from different legal systems. The drafting technique is that of European continental law: first, there is a general part where the abstract principles concerning the subject are described. The following part has specific provisions dedicated to the concrete regulation of well-defined liability hypotheses. However, some liability categories have features that are very close to the common law systems. The issue of non-contractual liability in Chinese law is constantly evolving, both because of the interpretations of the Supreme Court and because of the work done by the Chinese civil law scholars.

The solution proposed by the European Parliament is based on strict liability, i.e. the principle of fault is left behind to give priority to the event itself. The solution, therefore, is to create insurance guarantees, also by creating special funds.

From the perspective of the historian of law, the new issues, related to liability for damages, evoke legal matters that were addressed during the 19th and 20th centuries following the industrial revolution.

Basing on historical experience, which I shall explain in the following paragraph, the choice of the strict liability for damage should intervene only in a secondary way with respect to fault-

³ Cf. LEI CHEN - C.H. VAN RHEE (eds.), *Towards a Chinese Civil Code: Comparative and Historical Perspectives*, Leiden-Boston, 2012, especially: YAN ZHU, *The Bases of Liability in Chinese Tort Liability Law – Historical and Comparative Perspectives*, pp. 335 ff., and KEN OLIPHANT, *Uncertain Causes: The Chinese Tort Liability Law in Comparative Perspective*, pp. 395 ff.; GUO, MINGRUI/BI, XIAOXIAO, *The Main Function of Tort Liability Law of the People's Republic of China: To Prevent, to Deter and to Punish Tortious Conduct*, in H. Koziol (Ed.), *The Aims of Tort Law. Chinese and European Perspectives*, Wien, 2017, pp. 43 ff.

based liability. Firstly, because fault-based liability allows the claim of finding possible negligence which could be linked to codes of conduct drawn up by the respective industrial sectors. Secondly, the intervention of the judge would not only be aimed at obtaining compensation, which would be graduated according to the different forms of liability, but above all, it would allow forms of prevention of harmful events by inducing responsible behaviour both in the design and in the quality and safety controls of products.

Such a multilevel solution implies, of course, a virtuous circle between legislator, jurisprudence, doctrine, nevertheless, in the past as well as today, it seems that the ability of the judges is being questioned, as will be stated in the final section of this article.

2. The boundaries of liability: from fault-based liability to strict liability and back (to fault-based liability).

As in the past, blaming programmers or manufacturers for the damage caused by robots means blaming them for the price of technological development⁴.

The issue of liability for damages is, indeed, a central issue in the 19th century, when technological development and industrialisation generated many cases in which determining the fault of a damage was very difficult if not impossible. The 19th century is the “century of machines”, it is a hymn to progress, «la celebrazione della macchina a vapore, della nuova metallurgia, delle strade ferrate capaci di unire i continenti, della navigazione degli oceani rivoluzionata da navi senza vele e da transatlantici propulsi a elica»⁵ (the celebration of the steam engine, of new metallurgy, of the railway roads able to unite continents, of the ocean’s navigation revolutionized by sail-less ships and by propelled transatlantic ships).

Between the 19th and 20th centuries an intense legal debate ignited - over the classic cases of damages caused by railway

⁴ Cf. M. FAIOLI, *Mansioni e macchina intelligente*, Torino, 2018.

⁵ G. CAZZETTA, *Nell’età delle macchine. Artefici, operai, telegrafisti: diritto codificato e incertezze classificatorie dei giuristi*, in *Lavoro e diritto*, 2018, 3, p. 434.

sparks, explosion of steam boilers and accidents at work - which led to a reconsideration of the traditional link of causality between behaviour and responsibility for damage.

England was the first country involved in the industrial revolution, a pioneer in steam rail transport and therefore the first country to approach the problem of burning caused by railway sparks. Technological innovation had created, simultaneously with development, accidents that brought to light the conflict between industrial development and the rights of landowners. Only a simplistic approach can make us think that «the conflict was solved either in favour of railway companies or in favour of land-owners. Conversely, where land property was not so important and the controlling interest was the expansion of the new technology of railway transportation, the conflict would have been resolved in favour of railway companies»⁶.

In England, there was a complication, because the railway companies operated with the permission of the State and they could therefore have a sort of presumption in the correctness of their conduct. On the other hand, the railway companies bought the land at very high prices «and as the railway industry became more competitive, large payments for small amounts of land became more commonplace: the equation of economic development with public interest provided the central ideological justification for the invasion of the land by the railway»⁷.

In England the tort law was created by «the custom of the judges of the superior courts: it developed in a casuistic way, through their case law reasoning»⁸. The main approach, in relation to the damages caused by the spark, had been that of the stringent notion of fault-based liability of railway operators.

Usually the adoption of the principle of strict liability of the

⁶ M. MARTÍN-CASALS, *Technological Change and the Development of Liability for Fault: A General Introduction*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, Cambridge, 2010, p. 3.

⁷ Ivi, p. 10.

⁸ M. LOBBAN - J. MOSES, *Introduction*, in M. LOBBAN - J. MOSES (Eds.), *The impact of ideas on legal development, Comparative Studies in the Development of the Law of Torts in Europe*, vol. 7, Cambridge, New York, 2012, p. 10.

owner for damage caused by anything on his property is traced back to the case decided by the Exchequer Chamber in 1866 (*Rylands v. Fletcher*). However, there are reasons to doubt the turning point, because «the reason for the strictness in *Rylands v. Fletcher* was that it involved the infringement of property rights: the case would have been argued and decided differently had it involved personal injury»⁹.

Judge Bramwell L.J.'s opinion is interesting because it anticipated «arguments popular a full century later», namely that strict liability had sense if those who created progress also bore the social costs they produced. Indeed, in 1900 a Bill was introduced that «provide[d] for compensation without the need to prove fault, when crops were destroyed by sparks from railway engines». Meanwhile, economists theorised «that a strict liability [was] optimally efficient, as maximizing cost internalization (so that the cash cost of a product/service [represented] the true social cost of its manufacture or provision)»¹⁰.

Another "side effect" of technological progress was the issue of the explosion of steam boilers, which involved mainly workers. It is estimated that between 1865 and 1882, in the United Kingdom, boiler explosions caused 1,051 deaths and 1,519 injuries¹¹. Despite these serious consequences, there is no «mention of exploding boilers in any of the nineteenth-century tort textbooks»¹². Actually, the fact is not surprising because it was very difficult for the workers to bring cases before a court, not only because the legal costs were prohibitive, but also because of a condition of general weakness of the workers in the industrial context.

The serious issue of accidents was addressed by refusing the government's mandatory controls and by opting for self-regulation. As well as in Italy and France, in England associations of steam boiler users were established, which

⁹ J. MORGAN, *Technological Change and the Development of Liability for Fault in England and Wales*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, cit., p. 46.

¹⁰ Ivi, pp. 47-48.

¹¹ M. MARTÍN-CASALS, *Technological Change and the Development of Liability for Fault: A General Introduction*, cit., p. 12.

¹² J. MORGAN, *Technological Change and the Development of Liability for Fault in England and Wales*, cit., p. 52.

provided inspections aiming at preventing boiler explosions. The Boiler Explosions Act of 1881, intended to «improve investigation into case of accidents, but it did not aim at establishing compulsory boiler inspection»¹³. Compensation came by way of the practice of the "deodands", an «archaic legal doctrine mentioned in the Old Testament, an objective which had caused a human death would be offered up as a sacrifice to God, or rather, in England, forfeit to the Crown». The practice changed into the payment of a sum by the producer who had caused the death. Since the 1830s «In same case [...] juries were deliberately using the deodant to punish the railway, etc. for callous policy decisions. Sometimes, indeed, a jury may have used the threat of a substantial deodand to ensure that an employer properly compensated an accident victim's family»¹⁴. With the Fatal Accidents Act of 1846, the victim's family was allowed to obtain compensation for their loss. The Boiler Explosions Act of 1881 also provided «the awards referring to the amounts corresponding to investigation costs that [...] were to be paid by the negligent boiler owner and which could be reduced when he had already made provision for a dead worker's family»¹⁵. The Boiler Explosion Act cannot be defined as an effective remedy. The Boiler Explosions Act Commissioners enjoyed no real remedial powers, they were empowered to allocate the costs of the inspection but in «awarding costs, the commissioners were guided by moral blame and not formal legal liability, i.e. strict, vicarious liability was not sufficient for a finding of liability under the Act»¹⁶. In practical terms, the principle of strict liability led to more advantageous forms of insurance than the investigations established by law.

The English lawyers placed increasing emphasis on the

¹³ M. MARTÍN-CASALS, *op. ult. cit.*, p. 14.

¹⁴ J. MORGAN, *Technological Change and the Development of Liability for Fault in England and Wales*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, cit., p. 57.

¹⁵ M. MARTÍN-CASALS, *Technological Change and the Development of Liability for Fault: A General Introduction*, cit., p. 15.

¹⁶ J. MORGAN, *Technological Change and the Development of Liability for Fault in England and Wales*, cit., p. 63.

notion of fault «but they could not ignore the large space left within the common law for strict liabilities»¹⁷.

The Continental Europe experience differed from that of the common law for various reasons, not least for having codified civil liability: «in codified systems, the domain of delictual liability is shared between three actors: the judge, the legislator and the academic developing doctrine. The last word [...] belongs – or seems to belong – to the judge; but the first word is that of the legislator, in deciding whether or not to recognize a delictual liability»¹⁸.

In the legal systems of Continental Europe, the idea of fault-based liability remained central when approaching compensation for victims of damage caused by third parties, however after 1850 continental models diversified.

The Italian art. 1151 c.c. (Civil Code) of 1865 literally translated art. 1382 of the Napoleonic Code: «Tout fait quelconque de l'homme, qui cause à autrui un dommage, oblige celui par la faute duquel il est arrivé, à le réparer» (Any fact of the man who causes damage to others, obliges the one who caused the damage to compensate for it). The article stated the fundamental principle of *neminem laedere*, i.e. an absolute principle of not causing harm to others. It was also a general principle that can be interpreted by the courts in order to protect unjust damage beyond the limitations imposed by law¹⁹.

The necessary elements of fault-based liability were: the damage (dommage), the fault (faute) and the causal link (lien de causalité) between the behaviour and the damage suffered.

Technical development and industrialisation undermined the right to ownership considered "sacred" in the bourgeois systems of the liberal States. The need for strong protection of ownership «fa[ceva] saltare il filtro di equilibrio della responsabilità per colpa che tende[va] ad essere schiacciato

¹⁷ M. LOBBAN - J. MOSES, *Introduction*, cit., p. 11.

¹⁸ J. L. HALPÉRIN, *The process of codification applied to the law of delicts*, in M. LOBBAN - J. MOSES (Eds.), *The impact of ideas on legal development, Comparative Studies in the Development of the Law of Torts in Europe*, cit., p. 168.

¹⁹ G. CAZZETTA, *Responsabilità aquiliana e frammentazione del diritto comune civilistico (1865-1914)*, Milano, 1991, p. 343, available at <<http://www.centropgm.unifi.it/biblioteca/040/volume.pdf>>.

dal riferimento ‘sistematico’ al più vasto ed assorbente principio di ‘non ledere il diritto altrui’, del non soffrire una diminuzione qualunque dei beni senza indennità; principio che si affianca[va] a quello della colpa e lo svuota[va]»²⁰ (blew up the filter of balance of fault liability which tended to be crushed by the ‘systematic’ reference to the broader and more absorbent principle of ‘not violating the rights of others’, of not suffering any reduction in assets without compensation; a principle which went hand-in-hand with that of fault and emptied it). In the case of damage caused by railway sparks, case law applied the principle of *culpa in re ipsa* and, in order to ensure the compensation of damage, created «more a presumption of liability than a presumption of fault»²¹.

Decisions of the courts took into account the ease for railway companies to prove their lack of fault. Sometimes they adopted the strategy of the reversal of the burden of proof, or they presumed fault in the fact that damage occurred, or they presumed negligence in the adoption of preventive measures²².

The judges sometimes recognised that the damage was unavoidable, but the statutory right of inviolability of property (art. 29 and art. 436 c.c. [Italian Civil Code] 1865) had to prevail, thanks to which, indeed, a reasonable indemnity was guaranteed in the case of expropriation for public utility (art. 438 c.c. [Italian Civil Code] 1865).

If the damage could not be avoided by the railway companies, and therefore they were not to blame, it was possible to have recourse to Article 3 of the preliminary provisions of the Civil Code of 1865 «ed elasticizzare al massimo, sino a falsarle, le disposizioni sulla colpa, ma non [erano] tali da piegare la consolidata tradizione interpretativa nella lettura dell’istituto»²³ (and make the provisions on fault as flexible as possible, to the point of distorting them, but these were not capable of breaking the established tradition in

²⁰ Ivi, pp. 346-347.

²¹ C. FAVILLI, *Technological Change and the Development of Liability for Fault in Italy*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, cit., pp. 193-197.

²² Ivi, pp. 193-194.

²³ G. CAZZETTA, *Responsabilità aquiliana e frammentazione del diritto comune civilistico (1865-1914)*, cit., p. 351.

the interpretation of liability for fault). For instance, the article 574 of the Italian Civil Code, which provided for the prohibition of nuisance towards a neighbour²⁴, was interpreted in an analogical way. The decisions of the courts still tried to find a basis in the principle of fault-based liability, which was re-elaborated through presumptions and, if such a tool revealed itself not being sufficient, recourse was made «all'assolutezza del principio del *neminem laedere* e al tema della ingiustizia di una espropriazione senza indennizzo»²⁵ (to the absoluteness of the principle of *neminem laedere* and to the theme of the injustice of expropriation without compensation).

The courts introduced elements of extra-judicial evaluation into the decisions and constructed the judicial decisions by adapting the codified law to the values and interests shared by society. It was also for this reason that the judges subsequently returned to the rigorous principle of fault-based liability. Since 1915, the orientation of the Roman court of cassation prevailed, which overcame «a formalistic application of article 1151 c.c. and [established] a genuine interpretation of the responsibility for fault. Now the courts found civil liability only if the injured person was able to prove a fact which was imputable to the defendant in a subjective sense (fraud or fault), besides the *iniuria* and the link of causation to the damage»²⁶.

From a merely formal viewpoint, jurisprudential uncertainty and intolerable interpretative abuse by judges should be made known. However, the decision of the judges «had to reflect a number of factors, only one of which was the legal rules, and law should mirror social movements»²⁷; in the second judicial period, the decisions of the courts reflected the predominance of the general interest of the development of transport over the interest of landowners.

²⁴ Cf. C. FAVILLI, *Technological Change and the Development of Liability for Fault in Italy*, cit., p. 198.

²⁵ G. CAZZETTA, *op. ult. cit.*, p. 347.

²⁶ C. FAVILLI, *op. ult. cit.*, p. 199.

²⁷ J. BELL, *Continental European Jurisprudence 1850-2000*, in M. LOBBAN - J. MOSES (Eds.), *The impact of ideas on legal development, Comparative Studies in the Development of the Law of Torts in Europe*, cit., p. 111.

In Italy, the use of steam boilers was lesser than in the rest of Europe, however there was a high number of accidents²⁸. Also in relation to the phenomenon of the explosion of the boilers, solutions and approaches according to the French model were adopted. In addition to the articles of the Italian Civil Code (413 and 574), in 1888 a statute law on Public Safety No. 5888 *decies* was issued, which in Art. 27 provided for a safety certificate for new or restored steam boilers and for a supervision by local governmental authorities and technicians²⁹.

The subsequent regulation of 27th June 1897, No. 890, specified the activities of supervision but, unlike France, did not mention civil liability, so «the reference standard was the general rules on civil liability», or the articles concerning fault-based liability (art. 1151, 1152 and 1153 paragraph 4 of the Italian Civil Code).

The few decisions of the judges on boiler explosion damages followed the approach of the courts in the recognition of liability for damages caused by train sparks. The liability of boiler manufacturers was declared on the basis of the *culpa in re ipsa* also extended to unforeseeable and unavoidable damages. According to the judges, damage did not always involve negligence, «When an error was inescapable or when it was connected to the level of scientific knowledge at the time, these errors should not be equated to fault»³⁰.

If it was true that for legislators of the beginning of the 19th century, the «delictual liability was not perceived to be an important political question», things changed profoundly «after the first effects of the Industrial Revolution»³¹. The interpretative turning-point of the judges was the recourse to the general clause of articles 1382 and following ones of the Napoleonic civil code (articles 1151 and following articles of the Italian civil code), as in the famous *Teffaine* judgment of 16th June 1896. The French Court of Cassation, on the basis

²⁸ Cfr. S. LOLLINI, *Macchina a vapore*, in *Dig. It.*, vol. XV, I, Torino, 1927, pp. 31ff.

²⁹ <https://www.normattiva.it/do/ricerca/semplice/0>.

³⁰ C. FAVILLI, *Technological Change and the Development of Liability for Fault in Italy*, cit., p. 211.

³¹ J.L. HALPÉRIN, *The process of codification applied to the law of delicts*, cit., p. 177.

of the first paragraph of Article 1384, declared the strict liability of the entrepreneur for the explosion of a steam engine. The Court's decision influenced the judgments of the lower courts «but this line of case law was far from constant or universal». For example, in the *Grange* case, of 30th March 1897, the Supreme Court rejected the widow's petition, establishing that the cause of the accident was a fortuitous event³². The new interpretation of the first paragraph of article 1384 aroused an interesting debate in legal doctrine, however «an employee could still be found contributorily negligent, which accounted for a large number of cases. Furthermore, civil procedures were often lengthy and costly, with judges apparently awarding somewhat 'arbitrary' and unpredictable levels of compensation. Ultimately, the influence of article 1384(1) had a brief reign with respect to industrial accidents, as a Law of 9th April 1898 instituted a new regime»³³.

In the German model, the § 823 BGB did not formally provide for any general rule attributing the obligation to pay damages to any person who caused damage to others in an unlawful and culpable manner. In addition to the general elements of illegality and guilt, the German legislator required that a damage occurred to a good expressly protected by law.

The first exception to the principle of fault-based liability dated back to 1838 with the enactment of the PGE (Preußisches Gesetz über die Eisenbahnunternehmungen). The principle of strict liability «was seen as exceptional and even inappropriate for a systematic classification»³⁴.

In Germany, *culpa* was seen as a way of inducing responsible behaviour and, at the same time, a way of encouraging industrial development. The theory of *culpa* was developed by the Pandectist doctrine «with the clear intention to restrict the field of civil liability»³⁵. The *faute* under Art.

³² Y. SALMON, *Technological Change and the Development of Liability for Fault in France*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, cit., p. 113.

³³ Ivi, p. 114.

³⁴ J.M SCHERPE, *Technological Change and the Development of Liability for Fault in Germany*, in M. MARTÍN-CASALS (Ed.), *The development of liability in relation to technological change*, cit., p. 134.

³⁵ J.L. HALPÉRIN, *The process of codification applied to the law of delicts*, cit., p. 182.

1382 of the Napoleonic Code was similar to the German *Verschulden*, however the developments were different, because in France through the *faute* liability was extended, on the contrary the «*Verschulden* was the flag used by German jurists to prevent the development of strict liability»³⁶.

In 1871, with the Liability Act of the Reich, the «strict liability for railways, very much along the line of § 25 PGE»³⁷ was accepted.

As is well known, the codification of civil law in Germany took place only in the 20th century. The BGB (Bürgerliches Gesetzbuch) confirmed that responsibility had to involve fault: «Strict liability [...] was a concept alien to the civil law»³⁸. The question of liability was definitively resolved with the transfer «of (private) liability to the public insurance model», through the Accidental Insurance Act of 1884.

Germany was the first to introduce the social insurance scheme, which was later followed by other countries: England with the Worker's Compensation Act of 1897, Italy with the Law of 17th March 1898, No. 80 that established compulsory insurance for industrial injuries, France with the Law, 9th April 1898 concerning liability for industrial accidents and also Spain on 30th January 1900.

The European models of liability were certainly different; however, we can observe a tendency towards a progressive worsening of liability, especially in the historical periods marked by technological changes and industrial development.

Actually, the two models of civil law (the French and the German ones) have been "surpassed" by the compulsory insurance, i.e. by the allegation of liability that did not depend on the causal connection between damage and fault. The critical area of civil liability was represented by the issue of accidents at work. The legal doctrine developed hermeneutical categories that should have guided judges in their decisions (*culpa lievissima*, reversal of the burden of proof, strict liability). As is well known, the solution was taken outside the civil law, by means of a special law. In this way, the judges

³⁶ *Ibidem*.

³⁷ J.M SCHERPE, *op. ult. cit.*, p. 162.

³⁸ *Ivi*, p. 172.

were relieved from case-by-case decisions and went for the insurance solution.

The solution based on strict liability developed the insurance system and automated decisions; it subtracted the governance of new technologies from the legal domain. Renouncing to assess the responsibility of the actors was not without consequences, first of all there was no incentive for a responsible development of new technologies, on the contrary it ended up allowing, *de facto*, a development with very few limits³⁹.

Basically, in the past as today, there is a certain mistrust towards judges and jurisprudence, undoubtedly, writes Cazzetta: «il rapporto con la giurisprudenza appare come il nodo teorico da sciogliere in tema di responsabilità prima e dopo la scelta del sistema»⁴⁰ (the relationship with jurisprudence appears as the theoretical node to be dissolved in terms of liability before and after the choice of the system).

3. Legal certainty, judicial predictability and Justice.

We are late. The era of artificial intelligence is already here, and law must give answers to many open questions, otherwise it will be swept away. The use of artificial intelligence in the law field is indeed being introduced. Thanks to software designed by legal tech start-ups, a large number of documents can be examined very quickly. As a result, lawyers will enjoy easier decision-making processes and relief from repetitive work and low-level tasks, like for instance, providing real-time answers to simple questions on specific topics thanks to chatbots (conversation simulators). It is expectable that law firms will have to acquire competences in the field of innovation and will therefore increasingly acquire engineering competences.

³⁹ A. BERTOLINI - E. PALMERINI, *Regulating robotics: A challenge for Europe*, in EU Parliament, Workshop on «Upcoming issues of EU law» for the IURI Committee, Compilation of in-depth analyses, Publications Office of the EU Parliament, Brussels, 2014 ([https://www.europarl.europa.eu/RegData/etudes/IDAN/2014/509987/IPOL_IDA\(2014\)509987\(ANN01\)_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2014/509987/IPOL_IDA(2014)509987(ANN01)_EN.pdf)).

⁴⁰ G. CAZZETTA, *Responsabilità aquiliana e frammentazione del diritto comune civilistico (1865-1914)*, cit., p. 374.

In Italy as well, we have experimented the “interpretative algorithm”, a mathematical formula invented by the lawyer Luigi Viola⁴¹, that translates article 12 of the preliminary provisions of the Civil Code, that is the judge’s interpretative process in applying the rule to the case, into an algorithm. The aim, it is argued, is not to replace the interpretative activity of the judge, rather to support the jurist and the judges in the decisions, besides reducing the level of litigiousness and pushing towards forms which are alternative to the judicial procedure. This, the computability of the judicial decision, is an ancient aspiration that can be traced back at least to Leibniz, who proposed to «estendere al dominio della giurisdizione l’ideale della calcolabilità universale [...]. Una calcolabilità che comportava piena prevedibilità»⁴² (extend to the jurisdiction domain the ideal of universal computability [...]. A computability that involved full predictability).

The breakthrough changes introduced by digital technology undoubtedly have a heavier impact if compared with other transformations that justice has undergone in the past. For instance, the smart contracts that produce «une sorte de droit robotisé, qui s’applique seul, sans aucune intervention d’une instance juridique» (a kind of robotic law, which applies itself on its own, without any intervention by a legal instance). It represents a logic «qui ne se limite pas à court-circuiter les médiateurs professionnels: elle rêve de supprimer le langage lui-même comme support du droit pour le remplacer par des algorithmes»⁴³ (which is not limited to bypassing professional mediators: it dreams of removing language itself as a support for law and replacing it with algorithms).

We cannot ignore the risks connected to digital technologies applied in the legal field. The questions involved are various and

⁴¹ *Interpretazione della legge con modelli matematici. Processo, a.d.r., giustizia predittiva*, vol. 1, Milano, 2018.

⁴² M. LUCIANI, *La decisione giudiziaria robotica*, in *AIC*, 2018, 3, p. 879, available at https://www.rivistaaic.it/images/rivista/pdf/3_2018_Luciani.pdf; cf. A. CARLEO (a cura di), *Calcolabilità giuridica*, Bologna, 2017, in particular N. IRTI, *Per un dialogo sulla calcolabilità giuridica*, pp. 17 ff. See also, N. IRTI, *Un diritto incalcolabile*, Torino, 2016; A. CARLEO (a cura di), *Il vincolo giudiziale del passato*, Bologna, 2018.

⁴³ J. LASSÈGUE, *Justice digitale. Révolution graphique et rupture anthropologique*, Paris, 2018, p. 146.

very complex. In the extreme forms, predictive justice is a revolution on many levels that may question the human component of the *ius dicere*. Predictive justice and legal tech are born from the penetration of a capitalistic, profit-oriented logic into the legal profession⁴⁴. The ultimate goal of legal tech is to replace legal culture with artificial intelligence.

In my view, we are in a process that originated back in the 18th century, namely the trend to shift the governance of phenomena from the legal domain to that of politics, then to economics and now to technology.

The symptom of this trend is the figure of the judge progressively losing importance, in favour of the political dimension of the decision. Consequently, legal science has also lost its importance in favour of other scientific competences such as statistics, social sciences and hard sciences. These competences no longer support the judge in his decision, but tend to replace him in the decisional process.

There are some similarities with the 18th century also in the rhetorical strategy that emphasises the benefits of the future and devalues the present. Cesare Beccaria, the inspiring father of 19th century codifications, in his *On crimes and punishment* pamphlet exhorts legislators to adopt codes and dismantle the jurisprudential system of *ius commune*, and «let the laws be feared, and the laws only. Fear of the laws is salutary, but fear of men is a fruitful and fatal source of crimes»⁴⁵. The law, of course, must be merely syllogistically applied by the judge. To those who pointed out that "automated" justice would create injustice, Beccaria replied:

«The disorders, that may arise from a rigorous observance of the letter of penal laws, are not to be compared with those produced by the interpretation of them. The first are temporary inconveniences which will oblige the legislator to correct the letter of the law, the want of preciseness

⁴⁴ Cf. A. GARAPON, J. LASSÈGUE, *Digital Justice. Révolution graphique et rupture anthropologique*, Paris, 2018.

⁴⁵ C. BECCARIA, *Essay on crimes and punishments, translated from the Italian; with a commentary, attributed to Monf. De Voltaire, translated from the French, London, MDCCLXXV*⁴, chap. XLI, *Of the Means of preventing Crimes*, pp. 165-166.

and uncertainty of which has occasioned these disorders; and this will put a stop to the fatal liberty of explaining; the source of arbitrary and venal declamations. When the code of laws is once fixed, it should be observed in the literal sense, and nothing more is left to the judge, than to determine, whether an action be, or be not conformable to the written law. When the rule of right which ought to direct the actions of the philosopher, as well as the ignorant, is a matter of controversy, not of fact, the people are slaves to the magistrates. The despotism of this multitude of tyrants, is more insupportable, the less the distance is between the oppressor and the oppressed; more fatal than that of one, for the tyranny of many is not to be shaken off, but by having recourse to that of one alone. It is more cruel, as it meets with more opposition, and the cruelty of a tyrant is not in proportion to his strength, but to the obstacles that oppose him»⁴⁶.

In the same way, today, we are induced to emphasise the goodness of justice elaborated by intelligent machines and algorithms, because it is a democratic justice, since it is foreseeable and optimises results. And on the other hand, it is all too easy to discredit the work of judges, too fallible, or too conditionable, as we read in Beccaria's *Pamphlet*, the judges make the judgments depending on bad or good digestion.

A key point for the supporters of predictive justice is the achievement, at last, of legal certainty, confusing, however, legal certainty with the predictability of judicial decisions or with the necessity, this indeed real, of reducing the time needed for justice to respond⁴⁷. Legal certainty, understood as

⁴⁶ C. BECCARIA, *Essay on crimes and punishments, translated from the Italian; with a commentary, attributed to Monf. De Voltaire, translated from the French, London*; chap. V, *Of the Interpretation of Laws*, pp. 16-17.

⁴⁷ Cf. *Questione Giustizia trimestrale*, 2018, 4, (<http://questionegiustizia.it/rivista/2018-4.php>), in particular: A. NATALE, *Introduzione. Una giustizia (im)prevedibile?*, pp. 7 ff.; P. GROSSI, *Storicità versus prevedibilità: sui caratteri di un diritto pos-moderno*, pp. 17 ff.; E. VINCENTI, *Massimazione e conoscenza della giurisprudenza nell'era digitale*, pp. 147 ff.; C. CASTELLI - D. PIANA, *Giustizia predittiva. La qualità della giustizia in due tempi*, pp. 153 ff.; C. COSTANZI, *La matematica del processo: oltre le colonne d'Ercole della giustizia penale*, pp. 166 ff.; S. GABORIAU, *Libertà e umanità del giudice: due valori fon-*

predictability, probabilistic though, of the judge's decision, would sacrifice an essential function, that is to decide in the specific case. And it is an essential operation in the separation between the legislator ruling in an abstract and general way and the decision of the judge who applies the general principles to the concrete case.

Even without thinking about Prediction Machines, the mere prediction of the decision, as a support to the judge, can profoundly affect the decision of the judges. It is naïve to think that a judge cannot be conditioned by the expectations of the parties, who are well informed by the algorithms. The judges could find some relief if they could attribute the weight of uncomfortable decisions, for example precautionary measures, to machines, intelligent but nevertheless still conditionable, fallible and hardly liable.

In my opinion, a possibility opens up here to give back a key role to the interpreter that cannot be replaced or conditioned by any automatism. Jurists are today called to guarantee not the certainty of automatic application of the law, but the certainty of the correct decision in the concrete case.

Judges should enhance, with their legal cultural background, mechanisms and techniques already present in the legal system, and should understand the new application. Naturally, this calls into question the legal education of jurists. University education must be renewed and it must give priority to interdisciplinary and multidisciplinary education.

True innovation is a new juridical Humanism that makes men the key to the civilisation of trials, justice and society, also thanks to the aid of artificial intelligence. «Se devo scegliere qualcuno di cui *non* fidarmi» (If I have to choose somebody I cannot trust), writes Luciani, «personalmente, scelgo il giudice. E scelgo che sia un essere umano. Umano e consapevole dell'importanza, certo, ma anche dei limiti, della sua funzione»⁴⁸ (personally, I choose the judge. And I choose that it's a human being. Human and conscious of the importance, certainly, but also of the limits, of his/her function).

damentali della giustizia. La giustizia digitale può garantire nel tempo la fedeltà a questi valori?, pp. 200 ff.

⁴⁸ M. LUCIANI, *La decisione giudiziaria robotica*, cit., p. 893.