

Part I General framework

1. Global AI Regulation

Aviv Gaon

Fast evolving of artificial intelligence technology increasingly affecting different sectors such as transportation, health, security and finance. This emerging technology has the potential to impact nearly every segments of governance. To prepare for the challenges and opportunities that AI will give rise to, I offer an innovative model for governments to adopt. This model recognizes the uncertainty ahead and prioritizes oversight and accountability while also encouraging a flexible policy-first approach. I begin by providing a concise outline of AI regulation alongside an overview of the fields of AI technology that are poised to have an impact on a global scale. I further consider various settings of global AI regulation, including autonomous vehicles, health, privacy and social media. In doing so I also take a closer look at key policy initiatives and the impact of the recent EU's General Data Protection Regulation (GDPR). I draw attention to the positive implications of AI and consider some of the concerns that AI technology could give rise to. In the next parts, I explore some of the specific opportunities that AI technology and advanced automation will give rise to. I emphasize the importance of public trust and making sure that AI is used responsibly. My governance model is based on three pillars: education, private and public-sector oversight and access for world-class experts in AI and emerging technology. The combination of these three pillars will facilitate responsible AI Global policy that could be implemented in different countries and jurisdictions.

2. AI Regulation: A Comparative Perspective

Krishna Deo Singh

The question of regulating Artificial Intelligence (AI) is pertinent and timely. The technology has been steadily growing in its effectiveness and scope over the past several years. The technology promises fundamentally more efficient ways of conducting human affairs. At the same time, its efficacy could be problematic if it were to be applied in a manner which is at odds with human interests and well-being. Additionally, the 'control problem' or the potential of this technology to circumvent human control poses significant threats, at least in theory. Thus, strides must be made towards ensuring that the technology is regulated to ensure that the threats are minimized, at the same time ensuring that concerns relating to regulation stifling innovation at a nascent stage of the technology's development are addressed as well.

This paper proposes to add to the theoretical groundwork towards such regulation by analysing specific instances of current approaches towards regulating AI. More concretely, it performs a comparative analysis between the Indian "Discussion Paper – National Strategy for Artificial Intelligence", OECDs "Recommendation of the Council on Artificial Intelligence" and EUs "Ethics Guidelines for Trustworthy AI".

In summary, the OECD Recommendation identifies five clusters of complementary values-based principles for the responsible stewardship of trustworthy AI, including components such as inclusive growth, sustainable development and well-being, human-centred values and fairness, transparency and explainability, robustness, security and safety and accountability. The "Ethics Guidelines for Trustworthy AI" by the European Union focuses on three components of trustworthy AI, that it should be, lawful, ethical and robust.

“Discussion Paper – National Strategy for Artificial Intelligence”, a policy document by NITI Ayog, the think tank of the Indian Government, focuses on leveraging AI technologies to ensure social and inclusive growth for the development of the nation. The discussion paper does not focus on regulation of the technology per se, or standards of regulation.

Thus, it can be seen that while OECD and EU focus more on the trustworthiness of the AI, Indian discussion paper assumes general trustworthiness of the technology and focusses instead upon its implementation for policy objectives. It is concluded that Indian law would do well to adopt principles for ethical, robust and trustworthy AI.

3. Education in AI Era: Cultivating Humanities and Skills for Messy Problems

Wenjuan ZHANG

Artificial intelligence based on machine learning and computing power will have a deep impact on all sectors in the human society including education. Many discussions have been made about what and how to teach in order to respond to the AI era for the education sector. However, this paper focuses on discussing why and how to cultivate the strength of human beings holds that is the creativity of caregiving and social skills in solving messy problems. This discussion is meaningful not just for preparing the young generation to live comfortably in the AI Era. But more importantly, the kind of education efforts are even necessary to make the human society still human based not machine based.

Part II In the general context of India and China

4. The state of AI in India and the emerging governance structure of AI in India

Reji Joseph

In India the research and development activities on AI seems to be at a nascent stages. The recently released Hurun Global Unicorn List 2019 finds that there are 40 Unicorns globally in AI. However, India does not have any Unicorn in AI. The National AI Research and Development Plan (2016) of National Science and Technology Council of US, which reviewed patents granted and publications on AI, finds that India is not among the leading countries. It was only in 2018 that the Government of India initiated discussion on AI: NITI Aayog brought out a discussion paper on National Strategy for AI and the Department for the Promotion of Industry and Internal Trade published the AI Taskforce Report. In this background, the proposed paper aims to map the R&D on AI in India by analysing publications on AI from India and patents filed/granted on AI in India by residents. It will try to capture the institutions involved and the nature of R&D. The paper also aims to capture the emerging governance structure of AI in the light of the proposed data protection regulation and various reports of government agencies.

5. Major drivers on AI in Chinese Market – Patent Information based Perceptions and the Implications

CHEN Xiangdong; LI Ming

AI technologies and related patenting activities are fast developing in China. To understand how the progress developing in Chinese market is important for both practitioners and theoretical

researchers in technology management and IP management areas. This chapter deals with patented technologies in AI fields in recent development in Chinese market.

By applying typical studies on AI patents from international scholars (such as Fujii and Managi, 2018; Jo, 2018; Tseng and Ting, 2013), AI specific IPC codes are used in this study in order to collect AI patent data from China National Intellectual Property Administration (CNIPA) website, and the characters of the AI patents are clarified and contrasted with results of those international studies. Especially, this study focuses more on different actors (owners) of the AI technologies in typical sub-technical fields, with detailed group classification of patent owners, covering domestic/overseas in general, universities/industrial companies, as well as larger/smaller owners. In this way, a clearer picture could be drawn for AI technology development in Chinese market, with major actors in diversified technical fields. Meanwhile, an innovation theoretical analysis can be applied to such characters of the diversified actors.

The major research findings are (1) although AI patents by Chinese owners are still limited in overseas market, locally owned AI technologies in Chinese market are increasing fast during the last few years; (2) Universities (including overseas universities) play an important role in AI technologies in China; (3) In key competitive technical areas, overseas owners are still dominant players.

6. The Risks and Countermeasures of AI Application in China

JIANG Jie

In recent years, China's artificial intelligence (AI) products and services have entered the blowout stage. They have been widely used in security defense, public safety management, culture and education, finance and insurance, transportation and medical care, and agriculture, manufacturing, and service industries, etc. The phenomenon has not only produced a positive effect of improving residents' lives and promoted economic and social development, but also produced a series of risks. There are major incidents of disclosing data privacy in AI applications. The integration of artificial intelligence into finance service, insurance service, housing service, and other fields has raised human rights risks, such as prejudice, discrimination and differential treatment. AI Robots (Companion Robots, Educational robots, and Religious Robots, etc) reduce the person-to-person emotional interaction, and even produce psychological problems. Algorithmic collusion has broken the orderly market competition. AI Crime Prediction and AI Professional Behavior Assessment make an individual who has committed the minor violation be difficult to start a new life. In particular, a large number of artificial intelligence projects had failed between 2018 and 2019, which has caused huge economic losses to the country and people. Thus, China has issued a series of laws and regulations. Related enterprises, universities, and research institutes have established AIIA and actively carried out the construction of autonomous norms. Some leading companies have developed the internal system for self-regulation. These measures have achieved positive results, but there are still some tough problems.

Part III AI and IP

3.1. AI and IP in general

7. Evolving an ethical framework for Artificial Intelligence in India: Why the current IP policies need a radical relook?

Arul George Scaria

Like most other parts of the world, artificial intelligence (AI) is one of the buzzwords among policy makers in India too. Many policy makers see and project AI as the panacea for many of the socio-economic challenges faced by the country. This includes use of AI in improving efficiency in judiciary, decision making process in different organisations like tax offices and IP offices, agriculture productivity, firm productivity, better logistics management, and predictive policing. Unfortunately, most discussions in India on AI focus only on the potential positive impacts and do not discuss the diverse challenges posed by AI. For example, many states in India have started using AI in predictive policing. But most of them haven't taken any measures to ensure that the algorithms do not reflect or amplify the diverse biases in predictive policing. As shown by different scholars across the world, many algorithms and the data used for decision making reflect the biases of the persons who created the algorithms and the biases inherent in the society. When AI uses such biased algorithms and/or biased data for decision making, it further amplifies the biases. This is a particularly serious challenge in the Indian context, as many reports on policing in India, including the recently released Status of Policing in India Report 2019, illustrate that policing in India suffers from gender bias as well as bias towards minorities and members of Scheduled Castes and Scheduled Tribes. Similar is the challenge with regard to unrestricted use of AI by firms. For example, it is a fact that many firms are now engaging in algorithmic collusion and it is posing unprecedented challenges for competition in different markets. This chapter highlights the need for evolving an ethical framework for AI in India in the context of many such challenges posed by AI. The most important question that will be addressed by this chapter is whether the current IP policies in India are helpful in addressing the challenges posed by AI. The chapter shows that most IP policies are only trying to further strengthen the IP protection in the area and this might result in increase in the challenges posed by AI.

3.2. AI and Patent

8. Things Created! - Ownership in the time of Artificial Intelligence

Feroz Ali

We created things, and then, the things created other things. Should the things created by AI-enabled creator receive real property rights such as ownership just like us? The UPSTO recently raised a host of issues on AI some of which pertain to ownership. Scholars are divided on this issue. Of the ones who argue the restriction of property rights to AI do so based on the notion that real property promotes self-respect, which is unique to natural persons. Intentionality is another aspect of ownership. Should machines be granted the right of ownership even if they lack the desire or intent to create and own? Like an intent to commit a crime, a prerequisite for holding a person criminally liable, can there be an intent to possess requirement for holding property? Patent law emphasises on the possession of invention as a precondition for filing a patent. Possession of the intangible is demonstrated by the disclosure obligations ingrained in the patent. How does one demonstrate the possession of the intangible? The idea of possession in patent law goes beyond possession of property in the ordinary sense. It encompasses two things: the fact that the inventor can make the invention and that he has communicated the manner in which it can be made for a skilled person to understand (by way of an enabling disclosure). The skilled person is the addressee of the disclosure. The skilled person is also the determiner of the inventive step. How much the skilled person knows can be critical not only in ascertaining the requirement of what goes into the patent (written description) but also on what remains in the public domain as prior art. This paper compares AI-enabled creator to the person skilled in the art (PSITA or PHOSITA) as an AI-enabled creator will be attributed with the knowledge of the skilled person in that field. The hypothetical

construct of PSITA is much like a machine: it is capable of endless routine experimentation, has a capacity of not getting bored and can invent nothing on its own. Extending this legal fiction of PSITA to machines is the need of the hour in the time of machine creativity.

9. Can AI be designated as inventor in patent applications?

ChihChieh Yang

A multi-disciplinary international team led by Professor Ryan Abbott of the University of Surrey, submitted two inventions developed by AI to patent offices in the US, UK, Europe, Germany, Israel, Taiwan and China. In the two applications, "DABUS," which is described as "a particular type of connectionist artificial intelligence", was designated as the inventor. On 20 December 2019, the EPO has refused the two applications .

On 27 January 2020, the EPO published its official decision setting out the reasons for its refusal of these two patent applications. The EPO considered that the interpretation of the legal framework of the European patent system leads to the conclusion that the inventor designated in a European patent must be a natural person. The EPO further noted that the understanding of the term inventor as referring to a natural person appears to be an internationally applicable standard, and that various national courts have issued decisions to this effect.

This paper will analyze the EPO's decision and then study and compare the relevant patent law provisions from China and Taiwan. In particular, the comparison will focus on their respective inventor requirement. In addition, this paper will review and evaluate the government policy on AI-related patents from China and Taiwan.

3.3. AI and Copyright

10. AI and Creativity: AI's Future Impact on Copyright

Li Yahong, Ernest Kenneth- Southworth

The UK Copyright, Designs and Patents Act 1988 ("CDPA") sections 9 (3) and 178 address the issue of human and computer-generated creativity. The drafters of these sections saw a need to address the future use of computers in generating work and sought to do this in a way that gave authorship to a person (or his/ her employer) not the computer. This was done through s 9 (3) which gives authorship to a "person by whom the arrangements necessary for the creation of the work are undertaken." S. 178 further defines "computer-generated" as a situation in which "no human author of the work." In comparison, Hong Kong Copyright Ordinance 1997 s 11 (3) uses the exact wordings as those in CDPA s 9(3) in defining the author of a computer-generated work, while Indian Copyright Act 1957 s 2 (d) (vi) defines the author to be "the person who causes the work to be created." But neither Hong Kong nor India has a provision similar to CDPA s. 178 defining "computer-generated." A literal reading of these provisions provides a demarcation of human (or person) and computer creativity by giving the human copyright protection as an author. As a leading country in AI innovation, China's copyright law has no provision addressing "computer-generated" work.

Obviously, the foregoing provisions on "computer-generated work" were drafted at a time when computer and human generated work was easily divisible. This may not be the case at the present when the AI algorithms have already generated variety of literary and artistic works, and it is definitely not the case in the future if AI neural networks break through the "deep learning" barrier. The distinction between human and AI may not be so simple anymore.

This paper will not advocate IP rights for AI. However, the paper will propose that the foregoing provisions on computer-generated work can be amended to make clear the ownership of creative work where AI is concerned because they do not accurately reflect human and AI interaction as far as creativity goes. This paper will specifically compare and analyze the provisions in CIPA, Indian and Hong Kong copyright laws, and studying EU's suggestion of "electronic person" and other options to find a designation of authorship and ownership for computer (or AI)-generated work that better suits AI creativity. Such a designation will be very important for an AI-leading country like China whose copyright law does not have any provision addressing AI innovation.

11. AI Software Challenges in IP – How the Unequal Protection of Different Machine Learning Approaches in IP Raises the Issue of Reform"

Stefan Papastefanou, PhD candidate Bucerius Law School, Hamburg Germany

Artificial Intelligence (AI) is an interdisciplinary field of computer science with the aim of creating intelligent machine behavior. All over the world and especially in IT-heavy industries such as the United States, the European Union, India and China, machine learning has developed to be an immense asset and its applications are becoming more and more significant and relevant from everyday life to high-profile economic and even military interests. By realizing the significance of machine learning, it is subject of recent research how such products of machine learning models can and should be protected by IP law. The significant resources and investments necessary to execute efficient machine learning mechanisms raise claims for legal protection of such investments – this paper will illustrate the mechanics and legal challenges by focusing on the most popular variants: Neural Networking and Genetic Breeding Algorithms. In this context, multiple questions arise to balance the interests of AI programmers, data collectors, users and competitors – a satisfying solution has yet not been established.

In particular, this paper will demonstrate how inadequately contemporary IP law in China and India addresses Machine Learning by pointing out the difference of the level of protection re. Neural Networking and Genetic Breeding Algorithms. Even though both methods require similar investments regarding data and resources, they are treated unequally by IP law. It will be illustrated that such unequal treatment is likely to be unjustified and can potentially influence the future of AI development in an unintended and negative way.

This paper will evaluate the theoretical and practical application of several options to avoid such negative consequences by adjusting current IP legislation. Among the discussed options are a) introducing a new AI-related IP right b) amending the copyright provisions by including a new neighboring right and c) using other IP methods of balancing interests such as compulsory licensing.

12. Regulating algorithms by platforms for copyright infringement

ZHANG Jiyu

As cyberspace is becoming an increasingly significant space for human, and intelligent algorithms are used widely in cyberspace. There is a globe trend to break through the traditional safe harbor rules. The online content share service providers are enhancing ex ante copyright licensing and infringement monitoring, either as a voluntary measure or a result of the judicial and legislative practice. This encourages the innovation and development of the online algorithmic copyright enforcement measures and regulations. The algorithmic law enforcement in an intelligent society has inevitability and positive influence. The regulation of the algorithm should be guided by the legal

theories and beliefs of an intelligent society, such as the principle of legal and efficient information flow, the principle of balancing algorithmic power, public power and private rights, the concept of the “promoting” governance of sharing economy and the new gig economy, and the governance concept of “Collaboration, Participation, and Common Interests”. It should construct a new balance of interests between users and platforms, a co-governance mechanism beyond the “filtering obligation”, an authentication mechanism of the status and right-owner of a copyright, and an online collegiate mechanism for dispute resolution.

13. AI in the Legal Services Industry: Authorship Under Copyright Law in India and China

Renuka Medury

Artificial intelligence (‘AI’) is ubiquitous in today’s world. From suggestions on what to watch on ‘over the top’ platforms, to what to shop for on social media sites, AI has seeped into our daily existence in a subtle manner. Similar to other fields, the legal field has also embraced AI: ‘Ross Intelligence’, and ‘Watson’ are the most prominent illustrations of this advent in the field of legal services. The cost and time saving benefits associated with AI in document sorting and organization, legal research, fact finding, through the aid of machine learning has not escaped the legal services industry.

This chapter delves into the threshold question that emerges under copyright laws of India, and China, in respect of work produced by AI: the question of authorship. There are obvious barriers to recognizing AI as an author under the copyright laws of both countries. The Indian copyright law accords the status of an author to a natural person, while the copyright law of China permits an entity lacking legal personality to assume the status of an author only if the work is created under the will, sponsorship and responsibility of such entity. In order to approach this question, this chapter examines the nature of AI, i.e., what constitutes ‘AI’, which necessarily involves an evaluation of the extent of human intervention in the production of output by AI. Next, this chapter explores the conceptual understanding of authorship under the copyright laws of India, and China. Finally, this chapter will analyse the threshold question in light of the findings.

14. Fair Use Defense for Machine Learning in India and China: Dilemma and Solutions

HU Jingjing

Artificial Intelligence (AI) develops by machine learning (deep learning), which is trained on works from both the public domain and copyrighted works. The use of latter can lead to copyright infringement issues. Potential infringement can take place at both the input and output stages. If courts refuse to apply the fair use defense to machine learning, valuable innovation may be halted and AI industry stifled. To facilitate machinery learning in India and China, should their fair use doctrine be adjusted to open-ended approach and whether measures such as compulsory/statutory license mechanism should be expanded or adopted? What can India and China learn from each other? This paper analyze these issues under the Chinese and Indian copyright law by referring to experiences from the US (“transformative use” approach) and Japan (“not for personal enjoyment” approach).

3.4. AI and Trademark Law

15. Artificial Intelligence, Brand Business and Purchase Decision: Do Trademark Laws Need to be Adapted?

Vinita Krishna

Once a part of the fiction, now a reality, Artificial intelligence (AI) has become an integral aspect of human existence. Taking the lead US, China and Japan have made investment based on their infrastructure and the governance mechanism in place. India, in its National Strategy for Artificial Intelligence (AI) (2018) has identified the need to make its Intellectual Property (IP) regime attractive enough to incentivize research and adoption of AI. Bridging the gap between the lab & the market while nurturing an institutionalized research approach and innovation ecosystem unbounded by national borders and corporate firewalls are some of the steps in the right direction to build a sustainable AI business model. Apart from these generic concerns, AI raises concerns which are IP-specific. While AI raise concerns on definition of ownership to inventorship in case of patents and copyrights, for trademarks concerns over purchasing decision and the selection of brands as decided by say Alexa are likely to impact the buying behavior of customers and thus affecting the trademark and trademark law. In view of these, various questions on the AI-induced decision-making may come up, substantial brand value can be lost if the wrong decisions are made about the use of AI. These once “Rembrandts in the attic” turned “valuable assets” of the corporation will call for revisiting the IP policies to aid in the overall governance mechanism.

Few studies have critically evaluated the flip and flop side of AI’s impact on India’s emerging economy. This paper attempts to do so with a special focus on trademarks by examining the status in case of India & China. This being a secondary data-based study, will adopt the case methodology approach to examine the issues. As an outcome, this paper will bring out insights from AI’s impact on marketing/brand selection and the business thereof, roping in cases of Amazon’s “Project Zero” and Ali Baba’s initiative to detect fake products. This will provide cues to how IP strategies need to be redesigned In India.

Part IV AI and automobile industry

16. Use of Artificial Intelligence in the Indian automobile industry: Challenges and Opportunities in changing times

Smita Miglani

In line with the global trends, the Indian automotive sector is facing the challenge of diversifying towards increased automation, electrification and sustainable manufacturing practices in recent times. The use of artificial intelligence (AI) in the sector to increase manufacturing plants’ efficiencies, capabilities and minimize costs is picking up.

Inventory management, mass production protocols, quality control and testing routines in automobile factories are typically calibrated using AI algorithms. The AI algorithms also fine tune the frequency and intensity of energy conversion cycles. Other features powered by AI systems include automatic braking, passenger alert system, collision avoidance systems, pedestrian and cyclists alerts, GPS monitoring, intelligent cruise controls and cloud-hosted intelligence.

As per some estimates, currently, only around two percent of major automotive companies in India are implementing AI projects compared with around 25 percent in the United States and nine

percent in China. As per some estimates, the technology is said to increase operating profits by more than 10 percent in the industry.

The Indian automobile sector has unique characteristics in as far as the organizing, financial and design capabilities of players are concerned. The present study will focus on application of AI in Indian automobile industry and therein analyse the challenges and opportunities for manufacturers in the changing times. Given the historically crucial role of the government in development of the sector, the study will also specifically look at its role in facilitating this transformation. Additionally, it will make a brief analysis of AI application in the automobile sectors in China and other countries around the world to draw comparisons with India. The study would be based on secondary analysis, suggest the way forward for the industry and policymakers in the changing times.

17. State as a proactive organizer of indigenous technological learning: the development of Chinese autonomous vehicle

FENG Kaidong, FU Zhenyu

Autonomous vehicle is considered as a rule-changing invention. With an active strategy of leap-frogging, China is one of the leading forces in this industry. The Chinese government has developed various incentive schemes to promote its development. Particularly for the AI technology in autonomous vehicles, the government has granted leading mobile internet technology companies, such as Baidu, Tencent and Didi with testing licenses. L3 level of autonomous piloting, which is regarded as a turning point for industrialisation in this sector, has already been testing by these participants, which marks China as one of the potential world leaders. Around 12 cities have issued to set up testing and demonstrative zones, the development of infrastructures and electronic technologies such as dynamic cameras, laser radar, millimeter wave radar, GPS and computing platforms are also supported with governmental subsidies. All these seem to indicate a promising trend of Chinese autonomous vehicle.

However, the development of autonomous vehicle needs the participation of traditional automobile makers; but for path dependency in technology, traditional cost-performing strategy and the downturn of business cycle, they are more reluctant to invest. This chapter will look at how government agencies co-operate with firms in autonomous vehicles sector. Particularly, it investigates the governmental efforts in establishing an ecosystem to include players from ICT and mobile internet business. However, as the current development of autonomous piloting technology is in a blurred area between pre-industrialisation and market competition, it becomes a big challenge for Chinese government in cultivating the ecosystem and it has to develop diversified policy instruments according to technologies at different stage of matureness. Based on interviews (with ministries and companies) and document analysis, this chapter focuses on the experience of government-society interaction in facilitating this sector, and shed light on its prospects.

18. Patenting in Area of AI, Especially in Autonomous Vehicles

Malathi Lakshmikumaran, Ankur Garg

Artificial Intelligence (AI) is an era-defining technology. AI deals with technologies, systems or even processes that completely mimic how human beings make decisions, react to new information, speak, hear, as well as understand language. It encompasses artificial systems' potential to resolve

issues like reasoning and its ability to learn from previous experiences, skills that were traditionally ascribed to intelligent beings.

In the contemporary period the automobile sector is exploring the realm of AI and automation. To qualify as fully autonomous, a vehicle should be able to navigate without human intervention to a predetermined destination over roads that haven't been custom-made for its use. Such a self-driving car also referred as an autonomous vehicle or driverless vehicle uses AI algorithms that are basically real time data from sensors, cameras, lidar, GPS, radar and cloud services to travel between destinations without a human operator.

Development of AI in automobile sector has not only led to active exploration of autonomous vehicle programmes and extensive on-road testing by different organizations and R&D centres but has also raised demands of exclusive rights thereto. Patent applications are being filed for AI related inventions that enable vehicles to make autonomous decisions i.e. perception, analysis and decision making as a part of vehicle handling. Applications also include patents for inventions in traffic management, vehicle identification and automated parking. India is not an exclusion to this trending rise of patents in the area of AI and autonomous vehicles and the Patent filings in this area are on an increasing path.

Part V AI and Finance and Taxation

19. AI Application in Financial Industry: Who will be the future winner in China?

Juan HE

The application of artificial intelligence technology in the financial industry has made China's financial industry face a new competitive landscape. Internet head enterprises represented by Baidu, Alibaba, Tencent and JD.com have their own places in the competition with their R&D advantages in artificial intelligence technology and huge Internet user base. Traditional financial institutions are also taking advantage of their expertise, customer data, service network and financial products, as well as are exploring new applications of artificial intelligence in the financial sector. Therefore, China's intelligent finance sector has formed a competitive situation in which the competition and cooperation between Internet head enterprises and financial institutions coexist. This paper first analyzes the macro environment of China's intelligent finance development. After clarifying the legal and policy environment, this paper analyzes the patent applications of Internet head enterprises and financial institutions in the field of intelligent finance, focusing on the patent portfolio of major patent applicants and the application fields of high-value patents. On the basis of patent analysis, combined with Porter's five-force model, it analyzes the bargaining power of consumers, the threat of substitutes and the degree of competition among competitors in intelligent finance sector. Finally, it makes judgments on the future competition situation of Internet head enterprises and financial institutions in the field of intelligent finance and puts forward relevant development suggestions.

20. MODELING AN AI SYSTEM FOR TAX COMPLIANCE IN DEVELOPING COUNTRIES – THE CASE FOR INCORPORATING DIVERGENT AIS FOR SPECIFIC PUBLIC REVENUE GOALS

Roopashi Khatri

In this paper, the author demonstrates that the benefits of introducing a comprehensive Artificial Intelligence (AI) technology in tax administration are uncertain. Aggressive tax avoidance is the outcome of a taxpayer failing to satisfy the legal standard of the taxable transaction being conducted for genuine commercial reasons (and not for tax advantages alone). It is difficult to translate this legal standard into the AI architecture. Alternatively, an AI may be designed to monitor the ownership, use and value of the property (both tangible and intangible) or activities that generates taxable income. However, it is submitted that this proposal is also unlikely to be implemented due to at least six reasons. These are – excessive compliance and infrastructural costs; contentious nature of the right to property and privacy; subjective variables in property and contractual rights; taxpayer distrust in disclosing necessary information; incentives governments with weak institutions to overlook information regarding taxable property or transactions; risks of litigation against personnel and legislatures responsible for introducing this AI system.

The study conducted in this paper is based on the experience of the introduction of the Goods and Services Tax Network (GSTN) in India for the administration of the value-added tax system (replacing the earlier indirect tax regime). The failures for the GSTN regime indicated that the regulation of property and activities on a nation-wide basis is hindered by significant infrastructural and compliance challenges. The author presents research that supports the thesis that improved taxpayer compliance is primarily and unavoidably a function of taxpayers' faith in the fair, proper and transparent application of public revenues by an accountable government. The author further submits that a government body may nonetheless employ an AI system in a limited context in order to improve taxpayer trust and compliance. The author submits that the introduction of AI in tax administration may nonetheless be useful if the government bifurcates the various elements of efficient tax administration and assigns tasks to programmes designed for varying purposes. Code that assists in tax administration may be introduced in pre-existing programmes regarding: a) the appropriate allocation of tax expenditures across industries and businesses; b) the collection and use of cesses and fees for special purposes for which they are levied (particularly health and education, disaster management and environmental management – such as the "Swacch Bharat" cess). To this end, the author relies on pilot projects at state and national levels in India that are using/propose to use unique computational and information technology innovations in these sectors. The aim of the survey is to identify areas where AI systems may be introduced in the existing government infrastructure in order to assist tax compliance and taxpayer trust.

Part VI AI and Competition Law

21. AI development and governance in India and China

Vikas Kathuria

The AI-driven online platforms pose interesting challenges for competition policy. These platforms often act in a dual capacity—one as the provider of the multi-sided platform, another as a competitor on the very same platform. There have been cases where this dual role of platforms came under the scanner of competition agencies.

This year the EU started its investigation against Amazon. The Commission's investigation will look at the misuse of competitively sensitive data – about marketplace sellers, their products and transactions on the marketplace to Amazon's own advantage. Another example of conflict of interest is from India. It was alleged that foreign e-commerce firms were extending heavy discounts

on some products through their group companies, which in turn were driving out local retailers who were competing on the same platform.

Against this backdrop, the challenge is to define the role of online platforms through competition law and/or regulation to ensure consumer welfare. The competition law tool can be triggered only if the platform is a dominant undertaking in the relevant market. Alternatively, regulatory interventions can be required. There are two available models for regulation. The first one, as proposed in § 19a of the draft proposal for the 10th amendment of the German competition act, prohibits undertakings with “paramount significance for competition across markets” from using data that the undertaking had collected on a dominated market, or demand terms and conditions that permit such use. The enforcement, therefore, is restricted to some special cases. The second possible solution could be the Indian model. India, in its Foreign Direct Investment (FDI) rules on e-commerce, mandated the online platforms to act only as a pure marketplace. This research approaches these models and proposes the most optimal solution that while ensuring efficiency of the platform also promises effective competition in the online multi-sided markets.

22. The Boundary of Screen Scraping on the Internet in China

ZHANG Haoran

Artificial Intelligence (AI) is the engine of the future, and big data is the new oil that fuels AI. Data scraping is one of the most common ways to collect data on the internet for machine learning. However, where is the boundary for it? Many legal disputes on this issue arose in China, e.g., Dianping.com v. Baidu, Gumi v. Yuanguang. In practice, data collectors usually resort to Article 2 of Anti-Unfair Competition Law of China to protect their data assets, which found wide support from courts. The need to promote and protect investment in big data should be well balanced with the need to promote and protect free flow of data. If courts apply the general clause too broadly to give property-like protection to data, there are risks of data monopoly, which would restrain the development of AI.

This paper focuses on how to define boundary for data scraping properly. Current legislation in major jurisdictions, including US, EU and Japan, can be divided into two approaches. One is to provide exclusivities on data, e.g., sui generis right of database in EU. The other is to regulate misconducts, e.g., “to knowingly and with intent to defraud access a protected computer without authorization, or exceed authorized access according to the Computer Fraud and Abuse Act in US; the unauthorized acquisition, use, disclosure of “protected data” in bad faith under the Unfair Competition Prevention Act of Japan. Based on these main legislative models, this paper will deal with the following two issues: Whether behavioral regulation, rather than an exclusivity right, should be adopted to protect data sets in China. Furthermore, if the approach of behavioral regulation is preferred, how to define the misconducts?

e viability of guaranteeing access to Data via compulsory license in the two countries.

23. Facilitating Platform Competition in the Era of AI —Potential Effects of Data Portability and Suggestions on Its Implementation

ZHENG Shufeng

The development of AI has changed not only our daily life but also the way of business competition. With the machine learning technology, data have become the most critical resource for platform competition, especially for online service platforms like social networking, content sharing, e-commerce. However, the rising importance of data brings concerns in competition law regarding the increasing network effect and potential risks of data monopoly. This concern would be more critical in countries with large populations like China and India, where the vast amount of user data could be collected and used by platforms.

Data portability has been suggested as one of the means to address the above concerns. By allowing users to copy, withdraw, and transfer their data to other platforms, data portability theoretically could help reduce the users' switch cost, avoid lock-in effects, lower market entrance threshold, and weaken data monopoly. Consumers potentially benefit from having the right to data portability while market competition is enhanced by the existence of such rights.

However, there are many issues that need to be dealt with before data portability can be introduced: What is the scope of the to be ported data? It may lead to high compliance costs for SMEs and consequently lead to increase data concentration by big platforms.

This chapter explores the potential effect of applying data portability to platform competition and manners of its implementation in the context of India and China and explores relevant suggestions.

Part VII AI and Privacy

24. AI and Privacy in India and China

Will Mak

While Artificial Intelligence (AI) systems can boost productivity and enhance the standard of living, there is a risk that the use of AI technologies by states or corporations will have a negative impact on human rights, including the right to privacy. There is an increasing concern that AI systems should be regulated so that personal data are protected. The European Union (EU) has played an active role in data protection. The EU General Data Protection Regulation (GDPR) has provisions on automated individual decision-making and profiling, as well as provisions requiring transparency regarding the processing of personal data.

China and India have both established themselves as AI giants and started to discuss the regulation of AI systems in relation to privacy issues. China's Ministry of Science and Technology established the New Generation Artificial Intelligence Governance Expert Committee in 2019, which has released eight principles for the governance of AI. The principles have emphasised the respect for human rights, privacy and fairness. However, some scholars have commented that there are loopholes and exceptions that allow the government (and companies implicitly endorsed by the government) to bypass privacy protection. In India, the government set out a discussion paper on National Strategy for Artificial Intelligence in June 2018 and explored the idea of establishing a sectoral regulatory framework to address the AI privacy issues. Yet, it is not clear at the moment as to when India's first draft for the AI policy will be ready. This paper will focus on China's and India's privacy policies regarding AI technologies and compare them with those in the EU.

25. Changing Contours of Privacy in the Era of AI: A Need to Revisit

Professor Ramakrishna/

Privacy is commonly defined as the quality or state of being apart from company of others or away from scrutiny or observation. It is also known as seclusion or a freedom from unauthorised seclusion. In the famous Puttaswamy judgement in India it was laid down that privacy is an intrinsic part of fundamental right guaranteed under articles 14 and 21 of Constitution. Initially under the old school of jurisprudence, privacy existed in the physical plane and was identified with body and property through various theories of privacy. With the speed in technological growth especially in the area artificial intelligence, will the concept of privacy remain the same?

Andrew Ng, the leading thinker on artificial intelligence compares it with electricity and asserts that it will not spare any sector of the society. Artificial intelligence has changed its own course with time, it began with symbolic AI which needed manual or human help for its smooth functioning. The next stage is of machine learning or data driven AI where the manual help reduces and it moved to Artificial Neural Networks and deep learning. This stage needs lot of data for its smooth functioning and it moves to the stage of identifying images and sounds. It further is moving to the stage of Artificial Super intelligence.

With the present stage of machine learning and deep learning, breach of privacy has become more common. There is continuous surveillance with Aadhar (biometric identity scheme), tracking, monitoring and social profiling with android, finger printing, face recognition, cctv cameras etc which raises the concerns of privacy.

The liability of AI needs to be ascertained in case of breach of duty, or breach of consumer privacy or breach of an express or implied term of contract. Before the change to Artificial Super Intelligence takes place there is a need to lay down principles of machine morality.