

Autonomous Systems and the Law

Edited by

Nikita Aggarwal
Horst Eidenmüller
Luca Enriques
Jennifer Payne
Kristin van Zwieten

2019



Nomos

Table of Contents

| | |
|--|------------|
| Preface | V |
| Author Biographies | IX |
| Part A. Smart Contracts and Dispute Resolution | 1 |
| I. Smart Contracting: Simple, Digital, Automated (<i>Kai Jacob</i>)..... | 3 |
| II. Toward a Consumer Contract Law for an Algorithmic Age (<i>Lauren Henry Scholz</i>)..... | 9 |
| III. Smart Consumer Contracts: The End of Civil Procedure? (<i>Martin Fries</i>)..... | 13 |
| IV. Micro-Justice and New Law? ‘Swarm Arbitration’ as a Means of Dispute Resolution in Blockchain-Based Smart Contracts (<i>Andreas Hacke</i>) | 17 |
| V. How to Resolve Smart Contract Disputes: Smart Arbitration as a Solution (<i>Mateja Durovic</i>) | 23 |
| VI. Defining Smart Contracts: The Search for Workable Legal Categories (<i>Riccardo de Caria</i>)..... | 27 |
| Part B. FinTech and LegalTech | 35 |
| VII. Machine Learning, Big Data and the Regulation of Consumer Credit Markets: The Case of Algorithmic Credit Scoring (<i>Nikita Aggarwal</i>)..... | 37 |
| VIII. Regulating Robotic Conduct: On ESMA’s New Guidelines and Beyond (<i>Florian Möslein</i>) | 45 |
| IX. Consumer Finance 3.0: Behavioural Insights, Big Data and Digital Technologies (<i>Geneviève Helleringer</i>) | 51 |
| X. The Day After Tomorrow of Banking: On FinTech, Data Control and Consumer Empowerment (<i>Oscar Borgogno and Cristina Poncibò</i>) | 55 |
| XI. Innovation without Authorisation? The Regulatory Black Box of Cryptocurrencies in China (<i>Mimi Zou</i>)..... | 61 |
| XII. Paving the Way for Legal Artificial Intelligence: A Common Dataset for Case Outcome Predictions (<i>Ludwig Bull and Felix Steffek</i>) | 67 |
| Part C. Data Control and Cybersecurity | 73 |
| XIII. Machine Performance and Human Failure (<i>Horst Eidenmüller</i>)..... | 75 |
| XIV. Cities as Corporations? The Privatisation of Cities and the Automation of Local Law (<i>Sofia Ranchordás</i>) | 81 |
| XV. Blockchains and the Right to be Forgotten (<i>Michèle Finck</i>) | 87 |
| XVI. Automated Decisions Based on Profiling: Information, Explanation or Justification – That is the Question! (<i>Lokke Moerel and Marijn Storm</i>) | 91 |
| XVII. Biometric Data Matching Risks and the Rise of Self-Sovereign Identity (<i>Alan Morrison</i>)..... | 99 |
| Index | 105 |

Author Biographies

Nikita Aggarwal is a PhD candidate at the Faculty of Law, University of Oxford, and a Research Associate at the Oxford Internet Institute. Her research focuses on the interaction of law and emerging technologies, with a particular interest in the regulatory challenges arising from Big Data and machine learning. Prior to this, she was an attorney in the legal department of the International Monetary Fund, where she advised on financial and fiscal law reform and worked extensively on initiatives to reform the legal and policy frameworks for sovereign debt restructuring. She previously practiced as a solicitor with Clifford Chance LLP, where she specialized in EU financial regulation and sovereign debt restructuring. She earned her LLB (Hons) from the London School of Economics and Political Science.

Oscar Borgogno is a PhD candidate at the Law Department of the University of Turin, and a research fellow at the Tilburg Institute of Law and Technology of the University of Tilburg. His research agenda focuses on competition law, FinTech, data portability and payments services markets. He is currently also working on smart contract and blockchain capabilities to enforce the rights of weaker parties. He received the 'Donato Menichella' Scholarship 2018/2019 granted by the central bank of Italy.

Ludwig Bull is the CTO at CourtQuant, the premier litigation risk assessment platform for litigation funders and insurers in the UK. He has a background in computer science as well as law (Cantab). Originally from Germany, Ludwig has spent most of his life abroad. He is a marathon runner and practices martial arts.

Dr Riccardo de Caria is an Assistant Professor of Comparative Public Law at the University of Torino. He earned a PhD in public law from the University of Torino, and a Master of Laws (LLM) from the London School of Economics and Political Science. He has published many articles in national and international law reviews, and a book on lobbying regulation. He has also been dealing extensively with financial regulation. Recently, he has started working on the legal framework for blockchain, bitcoin, and smart contracts. He teaches Public Law and Economics at the University of Torino and has taught the same subject at the University of Aosta.

Dr Mateja Durovic is a Lecturer in Contract and Commercial Law at King's College London. Prior to this, he was an Assistant Professor (2015-2017) at the School of Law, City University of Hong Kong. He holds PhD and LLM degrees from the European University Institute, Italy (EUI), an LLM degree from the University of Cambridge, UK, and an LLB degree from the University of Belgrade, Serbia. Dr Durovic was a Post-Doc Research Associate at the EUI (2014-2015), Visiting Scholar at Stanford Law School, USA (2011), and at the Max Planck Institute of Private International and Comparative Law, Hamburg, Germany (2010). He has worked for the Legal Service of the European Commission, as well as being a consultant for the European Commission, The European Consumer Organisation (BEUC) and the United Nations. His work has been published in leading law journals (European Review of Private Law, European Review of Contract Law, Journal of Consumer Policy).

Dr Horst Eidenmüller is the Freshfields Professor of Commercial Law (Statutory Chair) at the University of Oxford and a Professorial Fellow of St Hugh's College, Oxford, since 2015. Eidenmüller was born in Munich, Germany. He obtained an LLM at Cambridge University (1989) and a PhD from Munich University (1994) after working for McKinsey & Co. in the 1990s. After his Habilitation in 1998, he was a law professor at the University of Münster from 1999 until 2003. From 2003 to 2014, he held the Chair for Private Law, German, European and International Company Law at Munich University. Eidenmüller's main research areas are contract law, company and bankruptcy law, and alternative dispute resolution. He is known for his economic and empirical analysis of important problems in these fields. Eidenmüller has held

visiting positions at major other universities such as Cambridge (2007), Harvard (2011) and Stanford (2014). From 2008 to 2009, he was a Fellow of the Institute for Advanced Study in Berlin. Eidenmüller is a Research Associate of the European Corporate Governance Institute (since 2009) and a Member of the Berlin-Brandenburg Academy of Sciences and Humanities (since 2008).

Dr Michèle Finck is a Senior Research Fellow at the Max Planck Institute for Innovation and Competition and a Lecturer in EU Law at Keble College, University of Oxford. Her research engages with law and technological change from the perspective of EU law. She has particular expertise in AI, Big Data, platforms and blockchains, as well as data (protection) law.

Dr Martin Fries is a private lecturer (Privatdozent) at the University of Munich (LMU). His research focuses on various topics around civil law, civil procedure, conflict of laws, legal ethics, and legal technology. Martin regularly serves as a mediator in commercial and inheritance disputes.

Dr Andreas Hacke studied law at the universities of Heidelberg, Leiden, Bonn and Münster (PhD). Since 2003 he has worked as a lawyer, arbitrator, mediator and academic. He regularly acts as an arbitrator, mediator and neutral expert to resolve complex national and international commercial and investment disputes. Further, he represents and advises corporate clients on all commercial and corporate matters. His special interest lies in designing tailor-made dispute resolution procedures to help resolve commercial and investment disputes. His academic work (both in research and in teaching) focusses on negotiation skills and on all forms of dispute resolution (litigation, arbitration, mediation and other forms of ADR). Andreas is Visiting Lecturer at the University of Oxford, teaching on the BCL/MJur courses on International Commercial Arbitration and on Commercial Negotiation and Mediation.

Dr Geneviève Helleringer is a Law Professor at ESSEC Business School, Institute of European and Comparative Law, Lecturer in Law at Oxford University and ECGI Research Member. Geneviève is an executive editor of the Oxford Journal of Financial Regulation (OJP).

Kai Jacob, a lawyer by education, joined SAP in 2008 and has headed the Global Contract Management Services team since 2011. In 2015, he was promoted to Global VP, assuming additional responsibility for Legal Information Management, aiming to support the digital transformation of the legal function. Kai joined the IACCM (International Association of Contract and Commercial Management) in 2004, became a member of its Board of Directors in 2012, and since January 2018 has been serving as Chairman of the Board. Kai is a regular speaker at conferences and has engaged in various round-tables, boards and initiatives in support of his vision of LIQUID LEGAL. In June 2018, Kai was appointed Chairperson of the newly founded Liquid Legal Institute e.V.

Alan Morrison is a Senior Research Fellow and Technology Editor for PwC. A 17-year veteran of PwC's think tanks in Silicon Valley, Alan identifies emerging technologies on the cusp of adoption, analyzes how they are being used by large enterprises, and assesses their near-term business impact on behalf of PwC's clients. Before PwC, Alan worked as a semiconductor market analyst, a retail site location analyst, a contract administrator for the Office of Naval Research at Stanford, and, on active military duty, as a US Navy intelligence analyst, Russian linguist and Aircrewman. Alan's work on dozens of different technologies has appeared on Next in Tech, Strategy + Business and other PwC sites, and has also appeared in Extreme Tech, Inc., and Recode. He has given invited talks at CDOvision, the Data Architecture Summit, Enterprise Data World, and SemTechBiz, among many other events. He was named a Quora Top Writer in 2016-2018.

Lokke Moerel is Professor of Global ICT Law at Tilburg University (The Netherlands) and Senior Of Counsel with Morrison & Foerster (Berlin). Her work with large U.S. tech giants on their strategic privacy and ethical issues has made her an expert on Big Data and artificial intelligence. Lokke is a member of the Dutch Cyber Security

Council (the advisory body of the Dutch cabinet on cybersecurity). In 2016, Ms. Moerel was appointed to be the co-author of the annual public advice to the Dutch government on behalf of the Dutch Lawyers Society (under the auspices of the Dutch Supreme Court) on Big Data and the Internet of Things. In 2018, Lokke received the International Law Office Client Choice Award for Best Tech Lawyer Germany.

Dr Florian Möslin is Professor of Law at Philipps-University Marburg and co-director of its newly founded Institute for Law and Regulation of Digitalisation. He previously held positions at the Universities of Bremen and St. Gallen. Florian graduated from Ludwig-Maximilians-University of Munich in 1998, after having received the degree 'licence en droit' from the University of Paris in 1996. He also holds a degree in business administration. In 1999, he was awarded a Master of Laws (LLM) from the University of London. Florian was a Jean-Monnet-Fellow at the European University Institute (Italy, 2007), and has been invited as a visiting fellow by the Universities of Sydney and Melbourne (Australia, 2011), as well as by the Universities of Berkeley and Stanford (United States, 2014). He has published various books, inter alia on corporate law, contract governance, financial innovation and default rules, in addition to numerous articles in German and European law reviews.

Dr Cristina Poncibò is a Professor of Comparative Private Law in the Law Department of the University of Turin, and a member of the PhD in Law, Person and Market board. She is also the Director of the Masters in International Trade Law of the ITC-ILO, the University of Turin and UNCITRAL. In her career, Cristina has obtained an 'IEF-Marie Curie Fellowship' of the European Commission at the Université Panthéon-Assas, a 'Max Weber Fellowship' of the European University Institute and a 'Lagrange Project Fellowship'. Before pursuing an academic career, Cristina was a trainee and associate at Allen & Overy. She is currently working on the intersection between contract law and technology in an international and comparative perspective.

Dr Sofia Ranchordás is a Professor of European and Comparative Public Law at the Faculty of Law of the University of Groningen and a Rosalind Franklin Fellow. She is also an Affiliated Fellow, and a former Resident Fellow, of the Information Society Project at Yale Law School. She has published a number of international peer-reviewed articles in international journals, book chapters, and well-ranked US law reviews. Her publications address the regulation of disruptive technologies, digital platforms, and the legal implications of data-driven regulation. She is the recipient of prestigious national and international grants (Knight Foundation, Independent Social Research Foundation, Dutch Science Foundation, Dutch Royal Academy of Sciences). She has advised the European Commission (DG GROW) and the Dutch Ministry of Interior on the regulation of disruptive technologies and is a regular invited speaker at international conferences.

Lauren Henry Scholz is an Assistant Professor at Florida State University College of Law. Before coming to FSU, she was a fellow at the Project on the Foundations of Private Law and the Berkman Klein Center for Internet & Society, both at Harvard Law School. She was also a fellow at Yale Law School's Information Society Project. Before entering academia, Scholz was a law clerk for the American Civil Liberties Union of Massachusetts and the Center for Democracy and Technology. Her research interests include contracts, torts, commercial law, information privacy and intellectual property.

Dr Felix Steffek is University Lecturer at the Faculty of Law, University of Cambridge, and Senior Member of Newnham College. He serves as Co-Director of the Centre for Corporate and Commercial Law and as Deputy Director of the LLM programme. In addition to technology and law, his research interests cover commercial law, company law, insolvency law and dispute resolution law. He applies doctrinal analysis, comparison of laws, economic analysis and justice theory to develop practical solutions and advance theory. Felix Steffek is a Member of the Editorial Board of the Journal of Corporate Law Studies, the Cambridge Yearbook of European Legal Studies and other academic journals. He has acted as an expert for the European Commission, the European Parliament, the World Bank, the OECD, national governments, courts,

Author Biographies

parliaments and science foundations. He studied in Cambridge (LLM), Heidelberg (PhD, undergraduate) and Hamburg (Habilitation, court clerkship).

Marijn Storm is an associate with Morrison & Foerster. His practice focuses on the intersection of data protection, information technology and intellectual property law. Resident in Morrison & Foerster's Brussels office, he has advised leading EU-headquartered companies and semi-governmental organizations on a range of their most pressing privacy and data security challenges. Marijn has provided extensive advice to clients on the implementation of data breach notification requirements, and in the context of security breaches, has assisted with notification to both regulatory authorities and data subjects. Marijn regularly authors Privacy + Data Security client alerts and presents at seminars on topics ranging from GDPR compliance and breach notification to cloud computing and 3-D printing.

Dr Mimi Zou is the inaugural Fangda Career Development Fellow in Chinese Commercial Law at the University of Oxford. Dr Zou obtained her Doctor of Philosophy in Law and Bachelor of Civil Law (Distinction) degrees from St John's College and Christ Church College, Oxford. She also graduated with first class honours degrees in Law, Economics, and Social Sciences (University Medal) from the University of Sydney. Prior to her appointment at Oxford, Dr Zou was an Edwards Fellow at Columbia Law School, Assistant Professor at the Chinese University of Hong Kong, and Senior Researcher at Utrecht University. Dr Zou is a qualified solicitor in England and Wales and lawyer in New South Wales (Australia). Alongside academia, she has worked and served as a consultant to law firms, international organisations, government departments, tech and financial institutions in Asia-Pacific and Europe for over 15 years.