HUMAN–ROBOT INTERACTION IN LAW AND ITS NARRATIVES

Robots are with us, but law and legal systems are not ready for them. This book identifies the issues posed by human–robot interactions in substantive law, procedural law, and law's narratives, and suggests how to address them. When human–robot interaction results in harm, who or what is responsible? Part I addresses substantive law, including the issues raised by attempts to impose criminal liability on different actors. When robots perceive aspects of an alleged crime, can they be called as a sort of witness? Part II addresses procedural issues raised by human–robot interactions, including evidentiary problems arising out of data generated by robots monitoring humans, and issues of reliability and privacy. Beyond the standard fare of substantive and procedural law, and in view of the conceptual quandaries posed by robots, Part III offers chapters on narrative and rhetoric, suggesting different ways to understand human–robot interactions and how to develop coherent frameworks to do that. This title is available as Open Access on Cambridge Core.

SABINE GLESS is Professor of Criminal Law at the University of Basel, Switzerland. Her research focuses on criminal justice issues related to the digitization of our living environment, as well as on human rights in transnational criminal law. As a member of editorial boards of journals and as a delegate in science funding committees, she particularly aims to promote interdisciplinary research on law and new technology.

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Legal Blame, Procedure, and Criminal Law

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This book is dedicated to Kate Claghorn and Hilda Geiringer, who contributed significantly to the understanding of statistics in central ways that paved the way for others who invented robots, and who each managed, against the odds and despite the challenges of their individual lives, to become a member of the scientific community.

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FOREWORD

Robots are not humans: they are "mere" machines that do as we tell them. They have no "will," no "consciousness" and no autonomy in the sense that humans do. As with dolls and diaries, we may be tempted to attribute a kind of agency to them, "recognizing" their inner mind, believing they understand our language and share our zest for life. As in the case of dolls and diaries, they may trigger our imagination and help us to generate new ideas while interacting with them, though, as with dolls and diaries, we need to emancipate ourselves from naïve beliefs in them being capable of suffering humiliation or joy. It is hard to steer free from, on the one hand, the attribution of human agency to lifeless contraptions that execute complex, mathematically informed programs and, on the other hand, the idea that they are mere tools like hammers, mechanical cars or newspapers. Unlike previous technologies, robots that thrive on machine learning can anticipate our behaviors and – depending on their program – pre-empt us by tweaking the choice architecture that channels our action potential. In that sense, robots are agents, though with "mindless minds."

This is a new chapter in the history of the relationship with our environment. We must learn to deal with the fact that these new types of agents can diminish or enhance our own agency, based on upstream design decisions taken by engineers who are keen on modeling our user behavior, hoping to make their machines ever more effective in steering us in the direction chosen by whoever pays for their design. As data-driven design is fundamentally probabilistic, whoever develops, provides, or deploys these robots takes the risk of harm due to errors, misuse, or unforeseen behaviors, and such risk-taking raises notable questions of guilt, wrongfulness and causality.

The release of ChatGPT has demonstrated how fluent our robot parrots have become and how easily they can convince us of the salience of their output. The release of large language models also reminds us

of the extent to which these models succumb to producing what Harry Frankfurt coined as "bullshit." Frankfurt distinguished bullshit from lying, explaining that whoever lies still cares about the truth, whereas those who bullshit have no interest in the truth, only in serving their own interests. Machines have no interests, not even in the truth. In that sense, their hallucinations are beyond both lying and bullshit. But when discussing criminal liability, the law of evidence, and criminal procedure, it is important to remember that even if positive law could very well attribute legal personhood to robots, there cannot be moral personhood for systems incapable of anything beyond the execution of – possibly highly complex and sophisticated – instructions.

The lack of moral personhood of robots highlights the well-known issues about who should be made liable for the harm caused by the potentially unpredictable behavior of these systems. These issues, in turn, confront us with the difference between criminal law, private law, and administrative and constitutional law. Whereas the attribution of private law liability to an AI system could at some point make sense, provided that those who took the risk of harming or diminishing others are not left off the hook, the attribution of criminal law liability is another matter. Blaming a system that has no intentionality in the sense of Brentano, i.e., intentionality as awareness of the world, would disrupt the foundational framework that has informed criminal law in constitutional democracies. Data-driven robots process data that serve as a proxy for the world they need to navigate, but they have no own stake in that world and no way of sensing, thinking, and acting as we do (which may raise some red flags regarding some of the definitions proposed in this volume). They have been programmed to model the distribution of the data, whether based on examples (supervised learning), on pattern recognition (unsupervised learning), or on goals defined in a way that a machine can execute (reinforcement learning). In the latter case, their output can be further "aligned" with the intended outcome by way of prompt engineering (reinforcement learning with human feedback). None of this, however, makes them aware of their environment. They can only process the data they are being trained on, following the mathematics that defines their model construction. The ingenuity, imagination, and novelty of their operations and output is the result of human investment; it is the developers, providers, deployers, and end-users who create, shape, and reconfigure robotic systems.

This edited volume takes the challenge of mindless, data-driven agency seriously, seeking to reconsider key tenets of substantive and

procedural criminal law. Moreover, this volume reaches beyond an inquiry into the fitness of doctrinal intricacies that were developed for another era, where law was text-driven if anything. The final part devotes keen attention to how we can explain to ourselves what the role of robots can and should be in the context of constitutional democracies and how this implicates the criminal law. All this engages the pivotal question of what world we want to live in, share, and reconstruct, turning the volume into a crucial intervention in the debate on how criminal law should respond to the integration of robots in everyday life. With a star line-up of authors, coming from a diversity of perspectives to scrutinize the same pressing issue, the reader will find themselves both enlightened and perplexed, on the verge of a better understanding of the complex underlying issues and real-world challenges posed by the design and the deployment of data-driven robots.

Professor Dr. Mireille Hildebrandt

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To better envision a world with human–robot interactions, we enlisted Bartosz Mamak to work with authors and produce an illustration to accompany the chapters. Thanks to Kamil Mamak, a post-doctoral researcher at the Department of Practical Philosophy at the University of Helsiński and an Assistant Professor of Criminal Law at Jagiellonian University, we were able to bridge multidisciplinary gaps and language challenges. We are grateful to the artist and the authors for working together in a non-traditional way to include visual expressions of key concepts offered by the book, and to the artist for the book cover.

This research project carried on through challenges posed by COVID-19, and we conducted many discussions online. We also had support from Daniel Seng and the National University of Singapore Centre for Technology, Robotics, Artificial Intelligence & the Law (TRAIL). At the end of the project, we held a hybrid session at the University of Basel, a conference at the Council of Europe, and an art exhibition of book illustrations at the Druckraum (Warteck, Basel). The editors wish to thank Clement Bailly, Carlo Chiaromonte, Marcel Mayer, Rosy Mürner, and Martin Thüring for their assistance.

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ABBREVIATIONS

AAVE	African American Vernacular English
ADR	alternative dispute resolution
ADS	automated driving system
AI	artificial intelligence
AIG	American International Group
AOT	Advanced Osteotomy Tools
API	First Additional Protocol to the Geneva Conventions
A*STAR	Agency for Science, Technology and Research
ATR	autonomous or automatic target recognition
AV	autonomous vehicle
AW	autonomous weapon
BCG	Boston Consulting Group
CARLO	Cold Ablation Robot-guided Laser Osteotome
CARTS	Committee on Autonomous Road Transport for Singapore
CCR	corporate criminal responsibility/criminal responsibility of corporations
CCTV	closed-circuit television
CEN	*Comité Européen de Normalisation* (European Committee for Standardization)
CENELEC	European Committee for Electrotechnical Standardization
CEO	Chief Executive Officer
CJEU	Court of Justice of the European Union
COMPAS	Correctional Offender Management Profiling for Alternative Sanctions
CCP	Code of Criminal Procedure
CrimPC	Criminal Procedure Code
CSLI	cell site location information
DNA	deoxyribonucleic acid
DSSAD	Data Storage System for Automated Driving
ECHR	European Convention on Human Rights
ECLI	European Case Law Identifier
ECtHR	European Court of Human Rights

EDR	Event Data Recorder
ENFSI	European Network of Forensic Science Institutes
ESI	electronically stored information
ETSI	European Telecommunications Standards Institute
EU	European Union
FISA	Foreign Intelligence Surveillance Act
FMH	Code of Conduct of the Swiss Medical Association
GAO	Government Accountability Office
GDPR	General Data Protection Regulation
GPS	Global Positioning System
HCDR	historical call data records
HMI	human–machine interface
HRI	human–robot interactions
ICC	International Criminal Court
ICL	international criminal law
IEEE	Institute of Electrical and Electronic Engineers
IHL	international humanitarian law
IoT	Internet of Things
IP	internet protocol
IRS	Internal Revenue Service
ISO	International Organization for Standardization
IT	information technology
LAPD	Los Angeles Police Department
LED	Law Enforcement Directive
LTA	Land Transport Authority
MedBG	Medical Professions Act
MHC	meaningful human control
ML	machine learning
MoT	Ministry of Transport (Singapore)
MPC	Model Penal Code
MRT	Mass Rapid Transit
NFI	Netherlands Forensic Institute
NHTSA	National Highway Traffic Safety Administration (US)
NTSB	National Transportation Safety Board
NTU	Nanyang Technological University
NTUC	National Trades Union Congress
NUS	National University of Singapore
NYPD	New York Police Department
OBD	On-Board Diagnostics
OEDR	Object and Event Detection and Response
RFID	radio frequency identification
RISC	*Recidive inschattings schalen*

robo-witness	robot witness
Rome Statute	Rome Statute of the International Criminal Court
SAVI	Singapore Autonomous Vehicle Initiative
SCC	Swiss Criminal Code
SDV	self-driving vehicle
SMRT	Singapore Mass Rapid Transport
STAR	Smart Tissue Autonomous Robot
StGB	*Strafgesetzbuch* (German Criminal Code)
TPA	Therapeutic Products Act
UK	United Kingdom
UN	United Nations
UNECE	UN Economic Commission for Europe
UNIDIR	UN Institute for Disarmament Research
US	United States
USA	United States of America
VIN	vehicle identification number
VIPER	Video Interactive Patrol Enhancement Response
VPN	virtual private network
Wjsg	Justice and Prosecution Data Act (*Wet justitiële en strafvorderlijke gegevens*)
Wpg	The Police Data Act (*Wet politiegegevens*)