

## 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.

HELENA WHALEN-BRIDGE is Associate Professor at the Faculty of Law, National University of Singapore. A recipient of multiple competitive research grants, her research interests include legal ethics and access to justice, legal narrative, and legal education. Her research in narrative was awarded the 2019 Teresa Godwin Phelps Award for Scholarship in Legal Communication, and she is the recipient of NUS Teaching Excellence Awards.

# HUMAN–ROBOT INTERACTION IN LAW AND ITS NARRATIVES

Legal Blame, Procedure, and Criminal Law

Edited by

SABINE GLESS

*University of Basel, Switzerland*

HELENA WHALEN-BRIDGE

*National University of Singapore*



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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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## CONTRIBUTORS

### Editors

SABINE GLESS is Professor of Law at the University of Basel, Switzerland. Her research focuses on international and European criminal law, as well as criminal justice issues related to the digitalization of our living environment. 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.

HELENA WHALEN-BRIDGE is Associate Professor of Law at the National University of Singapore. A recipient of multiple competitive research grants, her research interests include legal ethics and access to justice, legal narrative, and legal education. Her research in narrative was awarded the 2019 Teresa Godwin Phelps Award for Scholarship in Legal Communication, and she is the recipient of NUS Teaching Excellence Awards.

### Contributors

JÖRG ARNOLD is Deputy Director and Head of Science of the Zurich Science Institute (FOR) in Switzerland. He studied Physics at ETH Zurich and specialized in road traffic accident reconstruction. He has published several articles on technology and digitalization in the context of law, especially in connection with road traffic accidents, criminal law, and modern cars.

SARA SUN BEALE is the Charles L. B. Lowndes Professor of Law at Duke University, USA. Her research interests include the federal government's role in the criminal justice system, the laws defining federal crimes, and various issues of criminal procedure, including prosecutorial discretion.



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She has been active in law reform efforts related to the federal government's role in criminal justice matters.

MARTA BO is a researcher at the Dutch Asser Institute, Associate Senior Researcher at the Stockholm International Peace Research Institute (SIPRI), and Research Fellow at the Graduate Institute for International and Development Studies (Geneva, Switzerland). Her research focuses on emerging military technologies, autonomous weapons systems and their compliance with international criminal and humanitarian law.

BART CUSTERS is Professor of Law and Data Science and Director of eLaw, the Center for Law and Digital Technologies at Leiden University, the Netherlands. He has a background in both law and physics and is an expert in the area of law and digital technologies, including profiling, big data, privacy, discrimination, cybercrime, technology in policing, and artificial intelligence.

JANNEKE DE SNAIJER is a PhD student at the University of Basel, Switzerland. Her research focuses on criminal law and her PhD research investigates the applicability of the trust principle to human–robot interaction. She works and teaches at the University of Basel at the chair of Professor Dr. Sabine Gless.

JEANNE GAAKEER is Professor of Jurisprudence: Hermeneutical and Narrative Foundations at the Erasmus School of Law, Rotterdam, the Netherlands. Her research focuses on the meaning of narrativity to legal practice, especially judicial decision-making. She also serves as a Justice in the Criminal Law section of the Appellate Court of The Hague. She is co-founder, with Greta Olson (Giessen University), of the European Network for Law and Literature.

DAVID GRAY is the Jacob A. France Professor of Law at the University of Maryland, Francis King Carey School of Law, USA, where he teaches criminal law, criminal procedure, evidence, international criminal law, and jurisprudence. His research focuses on criminal law, criminal procedure, constitutional theory, and transitional justice. In 2019, he was named University Researcher of the Year in recognition of his scholarly contributions.

TATJANA HÖRNLE is the Director of the Department of Criminal Law, Max Planck Institute for the Study of Crime, Security and Law in Freiburg, Germany, and Honorary Professor at the Humboldt University in Berlin, Germany. Her research focuses on the foundations of criminal law, including theories of punishment, theories of criminalization, questions of attribution to the perpetrator, such as the justification of an accusation of guilt, and the role of the victim, as well as sexual criminal law.

HAYLEY LAWRENCE is an associate attorney at Gibson Dunn, USA. She received her Juris Doctor and Master of Laws (LLM) from Duke Law School in 2021. She served as Editor-in-Chief of the *Duke Journal of Constitutional Law & Public Policy* and received the Class of 2021 Intellectual Curiosity Award. She clerked for the Honorable Robin L. Rosenberg of the US District Court for the Southern District of Florida.

ERIN E. MURPHY is the Norman Dorsen Professor of Civil Liberties at New York University School of Law, USA. Her research focuses on technology in the criminal justice system, with a particular emphasis on forensic evidence. She is an internationally recognized expert in forensic DNA typing. In addition, she served as the Associate Reporter for the American Law Institute's project to revise Article 213 of the Model Penal Code, the law of sexual assault.

FRODE HELMICH PEDERSEN is Professor of Nordic Literature at the Department of Linguistic, Literary and Aesthetic Studies at the University of Bergen, Norway. He has written numerous articles and commentaries on literature, criticism, and social issues, and has been a member of the editorial boards of the journals *Prosopopeia*, *Vagant*, and *Vinduet*. In 2021, he was named literary critic of the year by the Norwegian Critics' Association.

ANDREA ROTH is Professor of Law at the University of Berkeley, USA. Her research focuses on how pedigreed concepts of criminal procedure and evidentiary law work in an era of science-based prosecutions. In 2021, she was appointed Chair of the Legal Resource Task Group of the National Institute of Standards and Technology's Organization of Scientific Area Committees. She is also an elected member of the American Law Institute.

EMILY SILVERMAN, a Senior Researcher at the Max Plank Institute for the Study of Crime, Security and Law in Freiburg, Germany, holds a JD

## LIST OF CONTRIBUTORS

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from the University of California, Berkeley, School of Law and an LLM from the University of Freiburg. Her current research focuses on the role of artificial intelligence in the administration of criminal justice. She has received grants from the German Academic Exchange Service (DAAD) and the Max Planck Society.

LONNEKE STEVENS is Professor of Law at the Vrije Universiteit Amsterdam, the Netherlands. After her PhD, she worked as a criminal lawyer in Amsterdam and as an associate professor. Since February 2016, she has been a full Professor of Criminal Law and Criminal Procedure in the Department of Criminal Law and Criminology. Her recent research focuses on the topics of evidence in criminal law and the standardization of detection in the digital age.

THOMAS WEIGEND is Emeritus Professor of Law at the University of Köln, Germany. He was Professor of Criminal Law and Criminal Procedure from 1986 to 2016, Head of the Institute of Foreign and International Criminal Law, and Dean of the Faculty of Law from 2009 to 2011. He is a co-editor of the *Zeitschrift für die gesamte Strafrechtswissenschaft* (ZStW). Until 2015, he was Head of the Criminal Law section of the Society for Comparative Law.

## 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

## FOREWORD

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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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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	<i>Comité Européen de Normalisation</i> (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

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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	<i>Recidive inschattings schalen</i>	

xxxix	LIST OF ABBREVIATIONS	xxxix
<i>robo-witness</i>	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	<i>Strafgesetzbuch</i> (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 ( <i>Wet justitiële en strafvorderlijke gegevens</i> )	
Wpg	The Police Data Act ( <i>Wet politiegegevens</i> )	