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EU privacy and data protection law applied to AI: unveiling the legal problems for individuals

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Bibliography

Ahuja S, Kumar J, 'Conceptualizations of user autonomy within the normative evaluation of dark patterns' (2022) Vol 24 Iss 4 Ethics and Information Technology

Akman P, *The concept of abuse in EU competition law* (Hart Publishing Ltd 2012)

Alonso E, 'Actions and agents' in Frankish Keith and Ramsey William M. (eds) *The Cambridge Handbook of Artificial Intelligence* (2014)

Alpaydin E, *Machine Learning: The New AI* (3rd edn MIT Press 2016)
-- -- *Introduction to Machine Learning* (4th edn MIT Press 2020)

Amit Y, Felzenszwalb P, 'Object Detection' in Katsushi Ikeuchi (ed) *Computer Vision – A Reference Guide* (Springer 2014)

Ariely D, Norton M, 'How actions create - not just reveal – preferences' (2007) Vol 12 Iss 1 Trends in Cognitive Sciences

Ausloos J, Veale M, Mahieu R, 'Getting Data Subject Rights Right' (2019) Vol 10 Iss 3 JIPITEC

Awasthi A, Mandal M, 'Facial Expressions of Emotions: Research Perspectives' in Manas K. Mandal, Avinash Awasthi (eds) *Understanding Facial Expressions in Communication* (Springer 2015)

Ayata D, Yaslan Y, Kamasak M, 'Emotion Recognition from Multimodal Physiological Signals for Emotion Aware Healthcare Systems' (2020) Vol 40

Bagger Tranberg C, 'Proportionality and data protection in the case law of the European Court of Justice' (2011) Vol 1 No 4 International Data Privacy Law

Bailey D, 'Presumptions in EU competition law' (2010) Vol 34 Iss 11 European Competition Law Review

Banakar R, Travers M, 'Introduction' in Reza Banakar, Max Travers (eds) *Theory and Method in Socio-Legal Research* (Hart Publishing 2005)

Barnhill A, 'What is Manipulation?' in Christian Coons, Michael Weber (eds) *Manipulation* (OUP 2014)

Barnhizer D, 'Inequality of bargaining power' (2005) Vol 76 Iss 1 University of Colorado Law Review

Barocas S, 'Data Mining and the Discourse on Discrimination' (2014)
-- -- and Nissenbaum H, 'Big Data's End Run around Anonymity and Consent' in *Privacy, Big Data, and the Public Good: Frameworks for Engagement* (CUP 2014)
-- -- and Selbst A, 'Big Data's disparate impact' (2016) Vol. 104 California Law Review

Barrett L et al. 'Emotional Expressions Reconsidered' (2019) Vol 20 (1) Psychological Science in the Public Interest

Bartlett M et al, 'Toward Automatic Recognition of Spontaneous Facial Actions' in Paul Ekman, Erika L. Rosenberg, *What the Face Reveals* (2nd edn OUP 2005)

Batini C, Palmonari M, Viscusi G, 'Opening the Closed World: A Survey of Information Quality Research in the Wild' in Luciano Floridi, Phyllis Illari (eds) *The Philosophy of Information Quality* (Springer Nature 2014)
-- -- and Scannapieco M, *Data Quality* (Springer 2006)

Baumann H, Dörig S, 'Emotion-Oriented Systems and the Autonomy of Persons' in Paolo Petta, Catherine Pelachaud, Roddie Cowie (eds) *Emotion-Oriented Systems* (Springer 2011)

Bellman R, *An Introduction to Artificial Intelligence: Can computers think?* (Boyd & Faser 1978)

Ben-Ze'Ev A, *The Subtlety of Emotions* (MIT Press 2000)

- Bennet B, Cohn A, 'Automated Common-sense Spatial Reasoning: Still a Huge Challenge' in Stephen Muggleton, Nicholas Chater (eds) *Human-Like Machine Intelligence* (OUP 2021)
- Berlin I, 'Counter Enlightenment' in Dictionary of the History of Ideas (1973)
-- -- *Liberty* (Hendry Hardy ed OUP 1969)
- Bernhardt C, *Turing's Vision: The Birth of Computer Science* (MIT Press 2016)
- Betancourt M, 'A Unified Treatment of Predictive Model Comparison' (2015)
- Biega A, Finck M, 'Reviving Purpose Limitation and Data Minimisation in Data-Driven Systems' (2021) *Technology and Regulation* 44-61
- Biermann J, Horton J, Walter J, 'Algorithmic Advice as a Credence Good' (2022) Centre for European Economic Research Discussion Paper No 22-071
- Binns R, Veale M, 'Is that your final decision? Multi-stage profiling, selective effects, and Article 22 of the GDPR' (2021) Vol 11 No 4 *International Data Privacy Law*
- Björkegren D, Grissen D, 'Behavior Revealed in Mobile Phone Usage Predicts Credit Repayment' (2020) Vol 34 Iss 3 *The World Bank Economic Review*
- Black J, 'Forms and paradoxes of principles-based regulation' (2008) Vol 3 No 4 *Capital Markets Law Journal*
- Blok P, 'Het recht op privacy: een onderzoek naar de betekenis van het begrip 'privacy' in het Nederlandse en Amerikaanse recht' (DPhil thesis, Tilburg University 2002)
- Blumenthal-Barby J, 'A Framework for Assessing the Moral Status of Manipulation' in Christian Coons, Michael Weber (eds) *Manipulation* (OUP 2014)
- Bolton T et al, 'On the Security and Privacy Challenges of Virtual Assistants' (2021) Vol 21 Iss 7 *Sensors*
- Bourtole L et al, 'Machine Unlearning' (IEEE Symposium on Security and Privacy, San Jose, May 2021)
- Brkan M, 'Do algorithms rule the world? Algorithmic decision-making and data protection in the framework of the GDPR and beyond' (2019) Vol 27 Iss 2 *International Journal of Law and Information Technology*
- -- and Bonnet G, 'Legal and Technical Feasibility of the GDPR's Quest for explanation of Algorithmic Decisions: of Black Boxes, White Boxes and Fata Morganas' (2020) Vol 11 Iss 1 *European Journal of Risk Regulation*
- Brown S, 'European regulation of consumer credit: enhancing consumer confidence and protection from a UK perspective?' in James Devenney et al (eds) *Consumer credit, debt and investment in Europe* (CUP 2012)
- Brown W, 'Technology, Workplace Privacy and Personhood' (1996) Vol 15 *Journal of Business Ethics*
- Bruno G, 'The Importance of the European Convention on Human Rights for the Interpretation of the Charter of Fundamental Rights of the European Union' in Giuseppe Palmisano (ed) *Making the Charter of Fundamental Rights a Living Instrument* (Brill Publishing 2014)
- Bublitz J, 'The Nascent Right to Psychological Integrity and Mental Self-Determination' in Andreas von Arnould, Kerstin von der Decken, Mart Susi (eds) *The Cambridge Handbook of New Human Rights* (CUP 2020)
-- -- and Merkel R, 'Crimes against Minds: On Mental Manipulations, Harms and a Human Right to Mental Self-Determination' (2014) Vol 8 Iss 1 *Criminal Law and Philosophy*
- Buckley F, 'Three Theories of Substantive Fairness' (1990) Vol 19 *Hofstra Law Review*
- Burr C, Cristianini N, 'Can machines read our mind?' (2019) Vol 29 Iss 3 *Minds and Machines*
-- -- and Cristianini N, Lydmann J, 'An Analysis of the Interaction Between Intelligent Software Agents and Human Users' (2018) Vol 28 *Minds and Machines*

Burrel J, 'How the machine 'thinks': understanding opacity in machine learning algorithms' (2016) Vol 3 Iss 1 Big Data Society

Bommasani R et al, 'On the Opportunities and Risks of Foundation Models' (2022) Center for Research on Foundation Models Stanford University < <https://arxiv.org/pdf/2108.07258.pdf> > accessed 8 February 2024.

Bygrave L, 'Ensuring Right Information on the Right Person(s)' (1996) University of Oslo Institute for Private Law

-- -- 'Automated Profiling, minding the machine: Article 15 of the EC Data Protection Directive and Automated Profiling' (2001) Vol 17 No. 1 Computer & Law Security Report 1

-- -- *Data Privacy Law: An International Perspective* (OUP 2014)

-- -- 'Minding the machine v2.0: The EU General Data Protection Regulation and Automated Decision Making' in Karen Yeung and Martin Lodge (eds) *Algorithmic Regulation* (OUP 2019)

-- -- Commentary of Articles 22 and 25 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)

-- -- 'Machine Learning, Cognitive Sovereignty and Data Protection Rights with Respect to Automated Decisions' (2021) University of Oslo Faculty of Law Legal Studies Research Paper Series No. 202-35

-- -- and Tosoni L, Commentary of Articles 4 (1) and 4 (7) in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)

Calders T, Custers B, 'What is Data Mining and How Does it Work?' in Bart Custers et al. (eds) *Discrimination and Privacy in the Information Society* (Springer 2013)

Calders T, Žliobaitė I, 'Why Unbiased Computational Processes Can Lead to Discriminative Decision Procedures' in Bart Custers et al (eds) *Discrimination and Privacy in the Information Society* (Springer 2013)

Calix R, Javadpour L, Gerald M. Knapp, 'Detection of Affective States From Text and Speech For Real-Time Human-Computer Interaction' (2012) Vol 54 No 4 Human Factors and Ergonomics Society

Calo R, 'Privacy, Vulnerability, and Affordance' (2017) Vol 66 Iss 2 Depaul Law Review

Calvo R et al, 'Introduction to Affective Computing' in Rafael Calvo et al (eds), *The Oxford Handbook of Affective Computing* (OUP 2015)

Campolo A et al, 'AI Now Report' (2018)

Cand S, Alpert M, 'Emotion in Speech: The Acoustic Attributes of Fear, Anger, Sadness, and Joy' (1999) Vol 28 No 4 Journal of Psycholinguistic Research

Canfora G, Di Penta M, 'New Frontiers of Reverse Engineering' (2007) Future of Software Engineering (FOSE '07)

Cao Y, Yang J, 'Towards Making Systems Forget with Machine Unlearning' (IEEE Symposium on Security and Privacy, San Jose, May 2015)

Carlini N et al, 'The Secret Sharer: Evaluating and Testing Unintended Memorization in Neural Networks' (USENIX Security Symposium, Santa Clara, August 2019)

Caplier A, 'Visual Emotion Recognition: Status and Key Issues' in Catherine Pelachaud (ed) *Emotion-oriented Systems* (Wiley-ISTE 2012)

Carr N, *The Big Switch: Rewiring the World, from Edison to Google* (W. W. Norton & Company 2009)

Chang S et al, 'Turn-Taking Prediction for Natural Conversational Speech' (Interspeech Conference Incheon, September 2022)

Chang Y et al, 'A Survey on Evaluation of Large Language Models' (2023)

Chee W et al, 'Brain Structure in Young and Old East Asians and Westerners: Comparison of Structural Volume and Cortical Thickness' (2011) Vol 23 Iss 5 Journal of Cognitive Neuroscience

- Cherednychenko O, 'Fundamental Freedoms, Fundamental Rights, and the Many Faces of Freedom of Contract in the EU' in Mads Andenas, Tarjei Bekkedal, Luca Pantaleo (eds) *The Reach of Free Movement* (Springer 2017)
- Cho S, 'Exploiting machine learning techniques for location recognition and prediction with smartphone logs' (2016) Vol 176 *Neurocomputing*
- Chow T, Siu-Yeung C, *Neural Networks and Computing: Learning Algorithms and Applications* (Imperial College Press 2007)
- Chuang Z, Wu C, 'Multi-Modal Emotion Recognition from Speech and Text' (2004) Vol. 9 No. 2 *Computational Linguistics and Chinese Language Processing*
- Chung H et al, 'Alexa, Can I Trust You?' (2017) Vol 50 Iss 9 *Computer*
 -- -- and Park J, Lee S, 'Digital forensic approaches for Amazon Alexa ecosystem' (2017) Vol 22 *Digital Investigation*
- Citron Keats D, Pasquale F, 'The scored society: Due process for automated predictions' (2014) Vol 89 Iss 1 *Washington Law Review*
- Clifford D, 'Citizen-consumers in a personalised Galaxy: Emotion influenced decision-making, a true path to the dark side?' (2017) *CiTiP Working Paper 31/2017*
 -- -- and Ausloos J, 'Data Protection and the Role of Fairness' (2018) Vol 37 No 1 *Yearbook of European Law*
- Cohen J, 'Affording Fundamental Rights' (2017) Volume 4 Iss 1 *Critical Analysis of Law*
- Cohn J, De La Torre F, 'Automated Face Analysis for Affective Computing' in Rafael Calvo et al (eds), *The Oxford Handbook of Affective Computing* (OUP 2015)
- Collins H, 'Good Faith in European Contract Law' (1994) Vol 14 No 2 *Oxford Journal of Legal Studies*
- Cowie R, 'Ethical Issues in Affective Computing' in Rafael Calvo et al (eds), *The Oxford Handbook of Affective Computing* (OUP 2015)
- Cramer R, Damgård I, Nielsen J, *Secure Multiparty Computation and Secret Sharing* (CUP 2015)
- Crawford K et al, 'AI Now Report' AI Now Institute (2018)
- Creutzfeldt N et al, 'Socio-legal theory and methods: introduction' in Naomi Creutzfeldt, Marc Mason, Kirsten McConnachie (eds) *Routledge Handbook of Socio-Legal Theory and Methods* (Routledge 2020)
- Culnan M, 'Protecting Privacy Online: Is Self-Regulation Working?' (2000) Vol 19 Iss 1 *Journal of Public Policy & Marketing*
- Custers B, *The Power of Knowledge* (Wolf Legal Publishers 2004)
 -- -- 'Data Dilemmas in the Information Society' in Bart Custers et al (eds), *Discrimination and Privacy in the Information Society* (Springer 2013)
 -- -- 'Profiling as inferred data. Amplifier effects and positive feedback loops' in Emre Bayamlioğlu, Irina Baraluic, Liisa Janssens and Mireille Hildebrandt (eds), *Being Profiled: Cogitas Ergo Sum* (Amsterdam University Press 2018)
 -- -- and Heijne A, 'The right of access in automated decision-making: The scope of article 15(1)(h) GDPR in theory and practice' (2022) Vol 46 *Computer Law & Security Review*
 -- -- and Ursic H, 'Big data and data reuse: a taxonomy of data reuse for balancing big data benefits and personal data protection' (2016) Vol 6 Iss 1 *International Data Privacy Law*
- Dahl J, Rudinow Sætnan A, 'It all happened so slowly – On controlling function creep in forensic DNA databases' (2009) Vol 37 *International Journal of Law, Crime and Justice*
- Daly I et al, 'Affective brain–computer music interfacing' (2016) Vol 13 No 4 *Journal of Neural Engineering*
- Das S et al., 'Applications of Artificial Intelligence in Machine Learning: Review and Prospect' (2015), Vol. 115, No. 9 *International Journal of Computer Applications*

- Davis E, Morgenstern L, 'Introduction: Progress in formal common sense reasoning' (2004) Vol 153 Artificial Intelligence
- de Barcelos Silva A et al, 'Intelligent personal assistants: A systematic literature review' (2020) Vol 147 Expert Systems With Applications
- De Laat P, 'Algorithmic Decision-Making based on Machine Learning from Big Data: Can Transparency restore Accountability' (2017) Vol. 31 Issue 4 Philosophy & Technology
- de Laat P, 'Algorithmic decision-making employing profiling: will trade secrecy protection render the right to explanation toothless?' (2022) Vol 24 Iss 1 Ethics and Information Technology
- de Terwangne C, Commentary of Article 5 and 16 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- de Vries K, 'Right to Respect for Private and Family Life' in Pieter van Dijk et al (eds) *Theory and Practice of the European Convention on Human Rights* (Intersentia 2018)
- Dewey J, *The Middle Works of John Dewey, Volume 9, 1899-1924* (Carbondale Southern Illinois University Press 1980)
- Dezfouli A, Nock R, Dayan P, 'Adversarial vulnerabilities of human decision-making' (2020) Vol 117 Iss 46 PNAS
- Dienst S, 'Lawful Processing of Personal Data in Companies under the GDPR' in Daniel Rücker and Tobias Kugler (eds) *New European General Data Protection Regulation: A Practitioner's Guide* (Beck/Hart/Nomos 2018)
- Dimitrova D, 'The rise of the personal data quality principle: is it legal and does it have an impact on the right to rectification?' (2021) Vol 12 No 3 European Journal of Law and Technology
- Docksey C, 'Four fundamental rights: finding the balance' (2016) Vol 6 No 3 International Data Privacy Law
- Dodge Y, 'Algorithm' in: *The Concise Encyclopedia of Statistics* (Springer New York 2006)
- Domínguez-Jiménez J, 'A machine learning model for emotion recognition from physiological signals' (2020) Vol 55 Biomedical Signal Processing and Control
- Doshi-Velez F et al, 'Accountability of AI Under the Law: The Role of Explanation' (2017) Berkman Klein Center Working Group on Explanation and the Law Working Paper
- Douglas T, Forsberg L, 'Three Rationales for a Legal Right to Mental Integrity' in: Sjors Ligthart et al (eds) *Neurolaw Palgrave Studies in Law, Neuroscience, and Human Behavior* (Palgrave Macmillan 2021)
- Dreyfuss R, van Eechoud M 'Choice of law in EU trade secrecy cases' in Jens Schovsbo, Timo Minssen and Thomas Riis (eds) *The Harmonization and Protection of Trade Secrets in the EU* (Edward Elgar Publishing 2020)
- Dubois D et al, 'When Speakers Are All Ears: Characterizing Misactivations of IoT Smart Speakers' (2020) Iss 4 Proceedings on Privacy Enhancing Technologies
- Dupré D et al, 'A performance comparison of eight commercially available automatic classifiers for facial affect recognition' (2020) 15 (4) PLoS ONE
- Dwork C, 'Differential Privacy' in Michele Bugliesi et al (eds) *Automata, Languages and Programming* (Springer 2006)
- -- and Roth A, *The Algorithmic Foundations of Differential Privacy* (Now Publishers Inc 2014)
- Dworkin G, *The Theory and Practice of Autonomy* (CUP 1988)

- Edwards L, Veale M, 'Slave to the Algorithm: Why a "Right to Explanation" is Probably not the Remedy You are Looking for' (2017) Vol 16 Iss 1 Duke Law & Technology Review
- Eke D et al, 'Pseudonymisation of neuroimages and data protection: Increasing access to data while retaining scientific utility' (2021) Vol 1 Iss 4 Neuroimage
- Ekman P, Friesen W, 'Constants across cultures in the face and emotion' (1971) Vol 17 (2) Journal of Personality and Social Psychology
- -- 'Facial Action Coding System: A Technique for the Measurement of Facial Movements' (1978) Consulting Psychologists Press
- El Emam K, Mosquera L, Hoptroff R, *Practical Synthetic Data Generation* (O'Reilly Media Inc 2020)
- Elfering S, *Unlocking the Right to Data Portability* (Nomos 2019)
- Engelbrecht A, *Computational Intelligence – An Introduction* (2 edn John Wiley & Sons 2007)
- Eskens S, 'Profiling the European Citizen in the Internet of Things: How Will the General Data Protection Regulation Apply to this Form of Personal Data Processing, and How Should It?' (2016) Master thesis University of Amsterdam
- Etteldorf C, 'EDPB on the Interplay between the ePrivacy Directive and the GDPR' (2019) Iss 5 No 2 European Data Protection Law Review
- Etzioni A, Etzioni, O 'Keeping AI Legal' (2016) 19 Vand. J. Ent. & Tech. L
- Eyal A, 'Reasoning and decision making' in Frankish Keith and Ramsey William M. (eds) *The Cambridge Handbook of Artificial Intelligence* (2014)
- Faden R, Beachamp T, King N, *A History and Theory of Informed Consent* (OUP 1986)
- Fang C et al, 'The Overfitting Iceberg' (Machine Learning Carnegie Mellon University 31 August 2020)
- Farkas L, O'Farrell O, 'Reversing the burden of proof: Practical dilemmas at the European and national level' (2015) document prepared for the European Commission
- Fayek H, Lech M, Cavedon L, 'Evaluating deep learning architectures for Speech Emotion Recognition' (2017) Vol 92 Neural Networks
- Fayyad M, 'Measures of the Principle of Good Faith in European Consumer Protection and Islamic Law, a Comparative Analysis' (2014) Vol 28 Arab Law Quarterly
- Finck M, Pallas F, 'They who must not be identified- distinguishing personal from non-personal data under the GDPR' (2020) Vol 10 No 1 International Data Privacy Law
- Finn R, Wright D, Friedewald M, 'Seven Types of Privacy' in S. Gutwirth et al. (eds.), *European Data Protection: Coming of Age* (Springer 2013)
- Floridi L, Illari P, 'Information Quality, Data and Philosophy' in Luciano Floridi, Phyllis Illari (eds) *The Philosophy of Information Quality* (Springer Nature 2014)
- Fogg B, *Persuasive Technology: Using Computers to Change What We Think and Do* (EBSCO Publishing 2003)
- Fosch Villaronga E, Kieseberg P, Li T, 'Humans forget, machines remember: Artificial intelligence and the Right to Be Forgotten' (2018) Vol 34 Iss 2 Computer Law & Security Review
- Fox R, 'Someone to watch over us: Back to the panopticon?' (2001) Vol 1 Iss 3 Criminal Justice
- François-Lavet V et al, 'An Introduction to Deep Reinforcement Learning' (2018), Vol. 11, No. 3-4 Foundations and Trends in Machine Learning

Franklin M et al, 'Recognising the importance of preference change: A call for a coordinated multidisciplinary research effort in the age of AI' (2022)

Franklin S, 'History, motivations, and core themes' in Frankish Keith and Ramsey William (eds) *The Cambridge Handbook of Artificial Intelligence* (2014)

Freudiger J, Shokri R, Hubaux J, 'Evaluating the Privacy Risk of Location-Based Services' in Danezis Georg (ed) *Financial Cryptography and Data Security* (Springer 2012)

Gaur M et al, 'Knowledge-Infused Learning: A Sweet Spot in Neuro-Symbolic AI' (2022) Vol 26 Iss 4 IEE Internet Computing

Gavanelli M, Mancini T, 'Automated Reasoning' (2013) Vol. 7 No. 2 *Intelligenza Artificiale*

Gavrilescu M, Vizireanu N, 'Predicting Depression, Anxiety, and Stress Levels from Videos Using the Facial Action Coding System' (2019) Vol 19 No 17

Generosi A, Ceccacci S, Mengoni M 'A deep learning-based system to track and analyse customer behaviour in retail store' (IEEE 8th International Conference on Consumer Electronics, Berlin 2018)

Gentile G, 'Two Strings to One Bow? Article 47 of the EU Charter of Fundamental Rights in the EU Competition Case Law: Between Procedural and Substantive Fairness' (2020) Vol 4 No 2 *Market and Competition Law Review*

Georgieva L, Christopher Kuner Commentary of Article 9 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)

Gerard D, 'Fairness in EU Competition Policy: Significance and Implications' (2018) Vol 9 No 4 *Journal of European Competition Law & Practice*

Ginart A et al, 'Making AI Forget You: Data Deletion in Machine Learning', *Advances in Neural Information Processing Systems* (2019)

Goffey A, 'Algorithm' in Matthew Fuller (ed) *Software Studies: A Lexicon* (MIT Press 2008)

Goldberg Y, *Neural Network Methods in Natural Language Processing* (Morgan & Claypool Publishers 2017)

Gonçalves dos Santos C, Papa J 'Avoiding Overfitting: A Survey on Regularization Methods for Convolutional Neural Networks' (2022) Vol 54 No Iss 10s *ACM Computing Surveys*

González Fuster G, *The Emergence of Personal Data Protection as a Fundamental Right of the EU* (Springer 2014)

-- -- 'Study on the essence of the fundamental rights to privacy and to protection of personal data' (2022)

-- -- and Peeters M, 'Person identification, human rights and ethical principles. Rethinking biometrics in the era of artificial intelligence' (2021)

Goodfellow I, Bengio Y, Courville A, *Deep Learning* (MIT Press 2016)

Goodman B, Flaxman B, 'European Union regulations on algorithmic decision-making and a right to explanation' (2017) Vol 38 No 3 *AI Magazine*

Gorin M, 'Towards a Theory of Interpersonal Manipulation' in Christian Coons, Michael Weber (eds) *Manipulation* (OUP 2014)

Graef I, 'Blurring Boundaries of Consumer Welfare' in Mor Bakhroum et al (eds), *Personal data in competition, consumer protection and intellectual property law* (Springer 2018)

-- -- and Husovec M, Purtova N, 'Data Portability and Data Control: Lessons for an Emerging Concept in EU Law' Vol 19 No 06 *German Law Journal*

-- -- and Clifford D, Valcke P, 'Fairness and enforcement: bridging competition, data protection, and consumer law' (2018) Vol 8 No 3 *International Data Privacy Law*

- Guinchard A, 'Taking proportionality seriously: The use of contextual integrity for a more informed and transparent analysis in EU data protection law' (2018) Vol 24 Iss 6 European Law Journal
- Guo L, 'Randomization Based Privacy Preserving Categorical Data Analysis' (DPhil thesis, University of North Carolina 2010)
- Gutwirth S, *Privacy and the information age* (Lanham: Rowman & Littlefield Publishers 2002)
- -- and Hildebrandt M, 'Some Caveats on Profiling' in Serge Gutwirth et al (eds), *Data Protection in a Profiled World* (Springer Nature 2010)
- Guzman A, Lewis S, 'Artificial intelligence and communication: A Human-Machine Communication agenda' (2020) Vol 22 Iss 1 New Media & Society
- Hacker P, 'Teaching fairness to artificial intelligence: Existing and novel strategies against algorithmic discrimination under EU law' (2018) Vol 55 Iss 4 Common Market Law Review
- Hallinan D et al, 'Neurodata and Neuroprivacy: Data Protection Outdated?' (2014) Vol 12 Iss 1 Surveillance and Society
- -- and Zuiderveen Borgesius F, 'Opinions can be incorrect (in our opinion)! On data protection law's accuracy principle' (2020) Vol 10 No 1 International Data Privacy Law
- Hammer L, *The international human right to freedom of conscience: some suggestions for its development and application* (Ashgate 2001)
- Harris D et al, *Law of the European Convention on Human Rights* (4th edn OUP 2018)
- Harrison J, *Handbook of Practical Logic and Automated Reasoning* (CUP 2009)
- Hastie T, Tibshirani R, Friedman J, *The Elements of Statistical Learning* (2nd edn 2008)
- Häuselmann A, 'Profiling and the GDPR: Harmonised Confusion' (2018) Jusletter 13
- Haworth L, 'Dworkin on Autonomy' (1991) Vol 102 Ethics
- Hazelrigg L, 'Inference' in Melissa Hardy, Alan Bryman (eds) *Handbook of Data Analysis* (Sage Publications 2004)
- Healey J, 'Physiological Sensing of Emotion' in Rafael Calvo et al (eds), *The Oxford Handbook of Affective Computing* (OUP 2015)
- Heigold G et al, 'End-to-End Text-Dependent Speaker Verification' (2015)
- Heinrichs J, 'The Sensitivity of Neuroimaging Data' (2012) Vol 5 Iss 2 Neuroethics
- Helberger N et al, 'The perfect match? a closer look at the relationship between eu consumer law and data protection law' Vol 54 Iss 5 Common Market Law Review
- Herbst T, 'Art. 5 Grundsätze für die Verarbeitung personenbezogener Daten' in Jürgen Kühling and Benedikt Buchner (eds) *DatenschutzGrundverordnung/BDSG* (2nd edn Beck 2018)
- Hijmans H, 'Commentary of Article 1' in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds) *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- Hildebrandt M, 'Primitives of legal protection in the era of data-driven platforms' (2018)
- -- and Koops B, 'The challenges of Ambient Law and Legal Protection in the Profiling Era' (2010) Vol. 73 (3) The Modern Law Review
- Hoeren T, 'The EU Directive on the Protection of Trade Secrets and its Relation to Current Provisions in Germany' (2018) Vol 9 Iss 2 JIPITEC
- Holzinger A, 'From Machine Learning to Explainable AI' (IEEE DISA Conference, Kosice, August 2018)

- Hourri S, Kharroubi J, 'A deep learning approach for speaker recognition' (2020) Vol. 23 Iss. 1 International Journal of Speech and Technology
- Hoy M, 'Alexa, Siri, Cortana, and More: An Introduction to Voice Assistants' (2018) Vol 37 No 1 Medical Reference Services Quarterly
- Hsu Y et al, 'Automatic ECG-Based Emotion Recognition in Music Listening' (2020) Vol 11 No 1 IEEE Transactions on Affective Computing
- Hwand H, David Matsumoto, 'Emotional Expression' in Catharine Abell, Joel Smith (eds) *The Expression of Emotion* (CUP 2016)
- Ienca M, Andorno R, 'Towards New Human Rights in the Age of Neuroscience and Neurotechnology' (2017) Vol 13 Iss 1 Life Science, Society and Policy
- -- and Haselager P, Emanuel E, 'Brain Leaks and Consumer Technology' (2018) Vol 36 Iss 9 Nature Biotechnology
- -- and Ignatiadis K, 'Artificial Intelligence in Clinical Neuroscience: Methodological and Ethical Challenges' (2020) Vol 11 Iss 2 AJOB Neuroscience
- -- and Malgieri G, 'Mental data protection and the GDPR' (2022) Vol 9 Iss 1 Journal of Law and the Biosciences
- Jampani V, 'Learning Inference Models for Computer Vision' (Dissertation, Universität Tübingen 2016)
- Jansen K et al, *Approximation, Randomization, and Combinatorial Optimization* (Springer 2004)
- Javed Y, Sethi S, Jadoun A, 'Alexa's Voice Recording Behavior: A Survey of User Understanding and Awareness' (ARES '19, Canterbury 26-29 August 2019)
- Jebelean T et al, 'Automated Reasoning' in Buchberger Bruno et al (eds) *Hagenberg Research* (Springer 2009)
- Jeunet C, N'Kaoua B, Lotte F, 'Chapter 1 - Advances in user-training for mental-imagery-based BCI control: Psychological and cognitive factors and their neural correlates' in Damien Coyle (ed) *Progress in Brain-Computer Interfaces: Lab Experiments to Real-World Applications* (Elsevier 2016)
- Jianxin Z et al., 'Privacy-preserving Machine Learning Based Data Analytics on Edge Devices' (AIES Conference, New Orleans, January 2018)
- Johnson-Laird A, 'Software Reverse Engineering in the Real World' (1994) Vol 19 Iss 3 University of Dayton Law Review
- Joseph Raz, *The Morality of Freedom* (OUP 1986) 369.
- Joshi Jet al, 'Multimodal assistive technologies for depression diagnosis and monitoring' (2013) Vol 7 Journal on Multimodal User Interfaces
- Jurafsky D, James M, *Speech and Language Processing* (2 edn, Pearson Education Limited 2014)
- Kanjo E et al, 'Emotions in context: examining pervasive affective sensing systems, applications, and analyses' (2015) Vol 19 Personal and Ubiquitous Computing
- Kapitein M, 'Personalized Persuasion in Ambient Intelligence' (Doctoral Thesis, TU/e Eindhoven 2012)
- Keats Citron D, Solove D, 'Privacy Harms' (2022) Vol 102 Iss 3 Boston University Law Review
- Kellermayr P, 'Big Neurodata: On the Responsible Use of Neurodata from Clinical and Consumer-Directed Neurotechnological Devices' (2018) Vol 14 Neuroethics
- Keltner D et al. 'Emotional Expression: Advances in Basic Emotion Theory' (2019) Vol 43 Iss 2 Journal of Nonverbal Behaviour
- Klimas T, Vaitiukait J, 'The Law of Recitals in European Community Legislation' (2008) Vol 15 No 1 ILSA Journal of International & Comparative Law

- Kline R, 'Cybernetics, Automata Studies, and the Dartmouth Conference on Artificial Intelligence' (2011) 4, *EEE Computer Society*
- Kokott J, Sobotta C, 'The distinction between privacy and data protection in the jurisprudence of the CJEU and ECtHR' (2013) Vol 3 No 4 *International Data Privacy Law*
- Kollar N, 'Virtue Ethics' in John K Roth (ed) *Ethics* (Salem Press Inc 2005)
- Kollmer T, Eckhardt A, 'Dark Patterns' (2022) Vol 64 Iss 6 *Business & Information Systems Engineering*
- Koning M, 'The purpose and limitations of purpose limitation' (Doctoral thesis, Radboud University Nijmegen 2020)
- Koops B, 'The trouble with European data protection law' (2014) Vol 4 No 4 *International Data Privacy Law*
 -- -- et al 'A Typology of Privacy' (2017) Vol. 38 Iss. 2 *University of Pennsylvania Journal of International Law*
- Kosinski M, Stillwell D, Graepel T, 'Private traits and attributes are predictable from digital records of human behaviour' (2013) Vol 110 No 15 *PNAS*
- Kosta E, Dumortier J, 'ePrivacy Directive: Assessment of transposition, effectiveness and compatibility within the proposed Data Protections Regulation' (2015)
- Kostas D et al, 'Please Forget Where I Was Last Summer: The Privacy Risks of Public Location (Meta) Data' (2019)
- Kotschy W, Commentary of Article 6 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- Kotu V, Deshpande B, *Data Science* (2nd edn Elsevier 2019)
- Kovač J, Štruc V, Peer P 'Frame-based classification for cross-speed gait recognition' (2019) Vol 78 *Multimedia Tools and Applications*
- Kranenborg H, Commentary of Articles 8 and 17 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- Krans B, Nylund A, 'Aspects of Procedural Autonomy' in Bart Krans, Anna Nylund (eds) *Procedural Autonomy Across Europe* (Intersentia 2020)
- Kranzberg M, 'Technology and History: "Kranzberg's Laws"' (1995) Vol 15 Iss 1 *Bulletin of Science, Technology & Society*
- Kröger J et al, 'Privacy Implications of Voice and Speech Analysis – Information Disclosure by Inference' in Michael Friedewald et al (eds) *Privacy and Identity management. Data for Better Living: AI and Privacy* (Springer 2020)
- Kröger J, Raschke P, 'Is My Phone Listening in? On the Feasibility and Detectability of Mobile Eavesdropping' in: Simon N Foley (eds) *Data and Applications security and Privacy XXXIII* (Springer 2019)
- Krysa J, Sedek G, 'Source Code' in Matthew Fuller (ed) *Software Studies: A Lexicon* (MIT Press 2008)
- Kumar K et al, 'Multi-modal brain fingerprinting: A manifold approximation based framework' (2018) Vol 183 *Neuro-Image*
- Kuner C et al, 'Expanding the artificial intelligence-data protection debate' (2018) Vol 8 No 4 *International Data Privacy Law*
- Kursuncu U, Gaur M, Sheth A, 'Knowledge Infused Learning (K-IL): Towards Deep Incorporation of Knowledge in Deep Learning' (2020)

- La Diega G, 'Against the Dehumanisation of Decision-Making: Algorithmic Decisions at the Crossroads of Intellectual Property, Data Protection, and Freedom of Information' (2018) Iss 1 Vol 9 JIPITEC
- Lance B et al, 'Brain-Computer Interface Technologies in the Coming Decades' (2012) Vol 100 Proceedings of the IEE
- Lanzig M, 'Strongly Recommended: Revisiting Decisional Privacy to Judge Hypernudging in Self-Tracking Technologies' (2019) Vol 32 Philosophy & Technology
- Laud P, Kamm L, *Applications of Secure Multiparty Computing* (IOS Press BV 2015)
- Lavazza A, 'Freedom of Thought and Mental Integrity: The Moral Requirements for Any Neural Prosthesis' (2018) Vol 12 Frontiers in Neuroscience
- Lazaro C, Le Métayer D, 'The Control over Personal Data: True Remedy or Fairy Tale?' (2015) Vol 12 Iss 1 SCRIPT-ed
- Lazarus R, *Emotion and Adaption* (OUP 1991)
- Lech M et al, 'Real-Time Speech Emotion Recognition Using a Pre-trained Image Classification Network: Effects of Bandwidth Reduction and Computing' (2020) Vol 2 Frontiers in Computer Science
- Lammerant H, de Hert P, 'Predictive profiling and its legal limits: Effectiveness gone forever' In Bart van der Sloot et al (eds) *Exploring the boundaries of big data* (2016 Amsterdam University Press/WRR)
- Lee C et al, 'Speech in Affective Computing' in Rafael Calvo et al (eds), *The Oxford Handbook of Affective Computing* (OUP 2015)
- Lee Y et al, 'AIMQ: a methodology for information quality assessment' (2002) Vol 40 Iss 2 Information & Management
- Leenes R, De Conca S, 'Artificial intelligence and privacy – AI enters the house through the Cloud' in Woodrow Barfield, Ugo Pagallo (eds) *Research handbook on the law of artificial intelligence* (Edward Elgar Publishing Inc. 2018)
- Lenaerts K, 'National Remedies for Private Parties in the Light of the EU Law Principles of Equivalence and Effectiveness' (2011) Vol 46 Irish Jurist
-- -- and Gutiérrez-Fons J, 'To Say What the Law of the EU Is: Methods of Interpretation and the European Court of Justice' (2013) European University Institute Working Paper AEL 2013/9
- Lench H, Koebel Capenter Z, 'What Do Emotions Do for Us?' in Heather C Lench (ed) *The Function of Emotions* (Springer 2018)
- Lerner J et al, 'Emotion and Decision Making' (2015) Vol 66 Annual Review of Psychology
-- -- and Small A, Loewenstein G, 'Heart Strings and Purse Strings' (2004) Vol 15 No 5 American Psychology Society
- Leuner J, 'A Replication Study: Machine Learning Models Are Capable of Predicting Sexual Orientation From Facial Images' (2018)
- Li D, Yang L, 'A Joint Introduction to Natural Language Processing and Deep Learning' and 'Epilogue: Frontiers of NLP in the Deep Learning Era' in Deng Li and Liu Yang (eds) *Deep learning in natural language processing* (Springer 2018)
- Li S, Jain A, 'Introduction' in Li Stan, Jain Anil (eds) *Handbook of Face Recognition* (2nd edn, Springer 2011)
- Liao L, 'Location-Based Activity Recognition' Dissertation University of Washington 2006
- Liu Y et al, 'Summary of ChatGPT-Related research and perspective towards the future of large language models' (2023) Vol 1 Meta-Radiology 1 – 14

- Lighthart S, 'Freedom of thought in Europe: do advances in 'brain-reading' technology call for revision?' (2020) Vol 7 Iss 1 *Journal of law and the biosciences*
- -- et al, 'Forensic Brain-Reading and Mental Privacy in European Human Rights Law: Foundations and Challenges' (2021) Vol 14 *Neuroethics*
- Lipton Z, 'The Mythos of Model Interpretability' (2018) Vol 16 Iss 3 *ACMQueue*
- Lühmann T, Schumacher P, Stegemann L, 'Gegenwart und Zukunft kollektiver Rechtsdurchsetzung im Datenschutzrecht' (2023) Volume 3 *Zeitschrift für Datenschutzrecht*
- Lupiáñez-Villanueva F et al, 'Behavioural study on unfair commercial practices in the digital environment: dark patterns and manipulative personalisation' (2022)
- Lynskey O, Commentary of Article 20 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- Mačénaitė M, 'Protecting Children Online: Combining the Rationale and Rules of Personal Data Protection Law and Consumer Protection Law' in Mor Bakhoun et al (eds) *Personal Data in Competition, Consumer Protection and Intellectual Property Law* (Springer Nature 2018)
- Macnish K, 'Unblinking the eyes: the ethics of automating surveillance' (2012) Vol 14 *Ethics and Information Technology*
- Makin J, Moses D, Chang E, 'Machine translation of cordial activity to text with an encoder-decoder framework' (2020) Vol 23 *Nature Neuroscience*
- Malgieri G, 'Trade Secrets v. Personal Data: A Possible Solution for Balancing Rights' (2016) Vol 6 No 2 *International Data Privacy Law*
- -- 'The concept of Fairness in the GDPR' (FAT* '20: Conference on Fairness, Accountability, and Transparency, Barcelona, January 2020)
- -- *Vulnerable People and Data Protection Law* (OUP 2022)
- -- and Comandé G, 'Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation' (2017) Vol 7 Iss 4 *International Data Privacy Law*
- -- and Custers B, 'Pricing privacy – the right to know the value of your personal data' (2017) Vol 34 Iss 2 *Computer Law & Security Review*
- -- and Niklas J, 'Vulnerable data subjects' (2020) Vol 37 *Computer Law & Security Review*
- Malkin N et al, 'Privacy Attitudes of Smart Speaker Users' (2019) Iss 4 *Proceedings on Privacy Enhancing Technologies*
- Mann M, Matzner T, 'Challenging algorithmic profiling: The limits of data protection and anti-discrimination in responding to emergent discrimination' (2019) Vol 6 Iss 2 *Big Data & Society*
- Mantello P, Manh-Tung H, 'Why we need to be weary of emotional AI' (2022) *AI & Society*
- Marcus G, Davis E, *Rebooting AI: Building Artificial Intelligence we can trust* (Pantheon Books 2019)
- Marechal C et al, 'Survey on AI-Based Multimodal Methods for Emotion Detection' in Joanna Kołodziej, Horacio González-Vélez (eds) *High-Performance Modelling and Simulation for Big Data Applications* (Springer 2019)
- Marengo F, *Privacy and AI: Protecting Individuals' Rights in the Age of AI* (2023)
- Markou C, Deakin S, 'Ex Machina Lex: Exploring the Limits of Legal Computability' in Simon Deakin, Christopher Markou (eds) *Is Law Computable?: Critical Perspectives on Law and Artificial Intelligence* (Hart Publishing 2020)
- Marshall J, *Personal Freedom through Human Rights Law? Autonomy, Identity and Integrity under the European Convention on Human Rights* (Martinus Nijhoff Publishers 2009)
- Marsland S, *Machine Learning: An Algorithmic Perspective* (2nd edn Chapman & Hall 2015)

Mary L, *Extraction of Prosody for Automatic Speaker, Language, Emotion and Speech Recognition* (2nd edn Springer 2019)

Mathur A, Mayer J, Kshirsagar M, 'What Makes a Dark Pattern... Dark?' (CHI Conference on Human Factors in Computing Systems, Yokohama, May 2021)

Matz S et al, 'Privacy in the age of psychological targeting' (2020) Vol 31 Current Opinion in Psychology
-- -- 'Psychological targeting as an effective approach to digital mass persuasion' (2017) Vol 114 No 48 PNAS

Mavroudis V, Veale M 'Eavesdropping Whilst You're Shopping: Balancing Personalisation and Privacy in Connected Retail Spaces' (Living in the Internet of Things Conference, London, March 2018)

Maxwell W, 'Principle-based regulation of personal data: the case of 'fair processing' (2015) Vol 5 No 3 International Data Privacy Law

Mayer-Schönberger V; Cukier K, *Big Data: A Revolution That Will Transform How We Live, Work and Think* (Houghton Mifflin Harcourt 2013)

-- -- and Padova Y, 'Regime change? Enabling Big Data through Europe's new Data Protection Regulation' (2016) Vol 17 No 2 Science and Technology Law Review

McStay A, 'Emotion AI, soft biometrics and the surveillance of emotional life: An unusual consensus on privacy' (2020) Vol 7 Iss 7 Big Data & Society

-- -- and Urquhart L, 'This time with feeling? Assessing EU data governance implications of out of home appraisal based emotional AI' (2019) Vol 24 No 10 First Monday

Mendoza I, Bygrave L, 'The Right Not to be Subject to Automated Decisions Based on Profiling' in Tatiana-Eleni Synodinou et al (eds) *EU Internet Law: Regulation and Enforcement* (Springer International 2017)

Menkel-Meadow C, 'Uses and Abuses of Socio-Legal Studies' in Naomi Creutzfeld, Marc Mason, Kirsten McConnachie (eds) *Routledge Handbook of Socio-Legal Theory and Methods* (Routledge 2020)

Michie S, van Stralen M, West R, 'The behaviour change wheel: A new method for characterising and designing behaviour change interventions' (2011) Vol 6 Implementation Science

Minsky M, *Semantic Information Processing* (MIT Press 1968)

Mitchell T, 'The discipline of Machine Learning' Carnegie Mellon University Paper CMU-ML-06-108 (2006)

Mittelstadt B et al, 'The ethics of algorithms: Mapping the debate' (2016) Vol 3 Iss 2 Big Data & Society

Mitchell M, Krakauer C, 'The debate over understanding in AI's large language models' (2023) Vol 120 Iss 3 PNAS 1-5

Moerel L, Priens C, 'Privacy for the Homo Digitalis: Proposal for a New Regulatory Framework for Data Protection in the Light of Big Data and the Internet of Things' (2016)

Mohri M, Rostamizadeh A, Talwalkar A, *Foundations of Machine Learning* (MIT Press 2012)

Molyneux C, Oyarzabal R 'What Is a Robot (Under EU Law)?' (2018) Vol 1 RAIL: The Journal of Robotics, AI & Law

Moore D, Commentary of Article 23 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)

Moses D et al, 'Real-time decoding of question-and-answer speech dialogue using human cortical activity' (2019) 10 Nature Communication

Mowbray A, 'The Creativity of the European Court of Human Rights' (2005) Vol 5 Iss 1 Human Rights Law Review

Mulligan K, Scherer K, 'Toward a Working Definition of Emotion' (2012) Vol. 4 No. 4 Emotion Review

- Munakata T, *Fundamentals of the New Artificial Intelligence* (2nd edn, Springer 2008)
- Munk T, 'Does Online Privacy Exist in the GDPR Era? The Google Voice Assistant Case' in Tatiana-Eleni Synodiou et al (eds) *EU Internet Law in the Digital Single Market* (Springer Nature 2021)
- Murphy K, *Machine Learning: A Probabilistic Perspective* (MIT Press 2012)
- Narayanan A et al, 'A Precautionary Approach to Big Data Privacy' in Serge Gutwirth et al (eds) *Data Protection on the Move: Current Developments in ICT and Privacy/Data Protection* (Springer Netherlands 2014)
- Narayanan A, Shmatikov V, 'Myths and Fallacies of Personally Identifiable Information' (2010) 53 Communications of the ACM
- Nautsch A et al, 'Preserving privacy in speaker and speech characterisation' (2019) Vol 58 Computer Speech & Language
- Newell S, Marabelli M, 'The Crowd and Sensors Era: Opportunities and Challenges for Individuals, Organizations, Society, and Researchers' (ICIS, Auckland, December 2014)
- -- 'Strategic opportunities (and challenges) of algorithmic decision-making: A call for action on the long-term societal effects of datafication' (2015) Vol. 24 Iss. 1 The Journal of Strategic Information Systems
- Nielsen M, 'Why are deep neural networks hard to train' in: *Neural Networks and Deep Learning* (Determination Press 2015)
- Nilsson N, *The Quest for Artificial Intelligence: A History of Ideas and Achievements* (CUP 2010)
- Niolenko S, 'Synthetic Data for Deep Learning' (2019)
- Nissenbaum H, *Privacy in Context: Technology, Policy and the Integrity of Social Life* (Stanford Law Books 2010)
- Nixon M, Aguado A, *Feature Extraction & Image Processing for Computer Vision* (3rd edn Elsevier 2012)
- Nordberg A, 'Trade secrets, big data and artificial intelligence innovation: a legal oxymoron?' in Jens Schovsbo, Timo Minssen and Thomas Riis (eds) *The Harmonization and Protection of Trade Secrets in the EU* (Edward Elgar Publishing 2020)
- Ohm P, 'Sensitive Information' (2015) Vol 88 Southern California Law Review
- Paszkiel S, *Analysis and Classification of EEG Signals for Brain-Computer Interfaces* (Springer Nature 2020)
- Pedreschi D et al, 'Open the Black Box: Data-Driven Explanation of Black Box Decision Systems' (2018)
- Pescatore P, 'Les objectifs de la Communauté européenne comme principes d'interprétation dans la jurisprudence de la Cour de justice' (1972) Vol 2 Miscellanea W.J. Ganshof van der Meersch
- Picard R, 'Affective Computing' (1995) MIT Media Laboratory Perceptual Computing Section Technical Report No 321
- -- *Affective Computing* (MIT Press 1997)
- Pieraccini R, *AI Assistants* (MIT Press 2021)
- Pipino L et al, 'Developing Measurement Scales for Data Quality Dimensions' in Richard Y Wang et al (eds) *Information Quality* (Routledge 2005 1 edn)
- Pound R, 'Law in Books and Law in Action' (1910) Vol 44 Iss 1 American Law Review
- Prasad D, Reddy A, Vasumathi D, 'Privacy-Preserving Naive Bayesian Classifier for Continuous Data and Discrete Data' in Raju Surampudi Bapi et al (eds) *First International Conference on Artificial Intelligence and Cognitive Computing* (Springer Nature 2019)
- Priyanka A, Gawali B, Suresh M, *Introduction to EEG- and speech-based emotion recognition* (Elsevier Inc 2016)

Purcell R, Rommelfanger K, 'Internet-Based Brain Training Games, Citizen Scientists, and Big Data: Ethical Issues in Unprecedented Virtual Territories' (2015)

Purtova N, 'Do property rights in personal data make sense after the Big Data turn?' (2017) Vol 10 No 2 Journal of Law & Economic Regulation

-- -- 'The law of everything. Broad concept of personal data and future of EU data protection law' (2018) Vol 10 Iss 1 Law, Innovation and Technology

Quentin A et al, 'Consumer Choice and Autonomy in the Age of Artificial Intelligence and Big Data' (2018) Vol 5 Customer Needs and Solutions

Quintana D et al, 'Heart rate variability is associated with emotion recognition: Direct evidence for a relationship between the automatic nervous system and social cognition' (2012) Vol 86 No 2 International Journal of Psychophysiology

Rainey S et al, 'Is the European Data Protection Regulation sufficient to deal with emerging data concerns relating to neurotechnology?' (2020) Journal of Law and the Biosciences

Rashid M et al, 'The classification of EEG Signal Using Different Machine Learning Techniques for BCI Application' in J.-H. Kim et al (Eds) *Robot Intelligence Technology and Applications* (Springer 2018)

Raz J, *The Morality of Freedom* (OUP 1986)

Redman T, 'Measuring Data Accuracy: A Framework and Review' in Richard Y Wang et al (eds) *Information Quality* (Routledge 2005 1 edn)

Reece A, Danforth C, 'Instagram photos reveal predictive markers of depression' (2017) Vol. 6 No. 15 EPJ Data Science

Ridgeway C, 'Why Status Matters for Inequality' (2013) Vol 79 Iss 1 American Sociological Review

Ritter C, 'Presumptions in EU competition law' (2018) Vol 6 Iss 2 Journal of Antitrust Enforcement
Roberto Pieraccini, *AI Assistants* (MIT Press 2021)

Roberts C, 'Reversing the burden of proof before human rights bodies' (2021) Vol 25 Iss 10 The International Journal of Human Rights

Rocher L, Hendrickx J, Yves-Alexandre de Montjoye, 'Estimating the success of re-identifications in incomplete datasets using generative models' (2019) Vol 10 Nature Communications

Rodotà S, 'Data Protection as a Fundamental Right' in Serge Gutwirth et al (eds), *Reinventing Data Protection?* (Springer 2009)

Rommelfanger K et al, 'Mind the Gap: Lessons Learned from Neurorights' AAAS Center for Science Diplomacy (2022)

Rosenberg E, 'Introduction: The Study of Spontaneous Facial Expressions in Psychology' in Paul Ekman, Erika L. Rosenberg, *What the Face Reveals* (2nd edn OUP 2005)

Rouvroy A, Pouillet Y, 'The Right to Informational Self-determination and the Value of Self-development: Reassessing the Importance of Privacy for Democracy' in Serge Gutwirth et al (eds), *Reinventing Data Protection?* (Springer 2009)

Rumelhart D, Hinton G, Williams R 'Learning representations by backpropagating errors' (1986) Vol. 323 Nature

Russel S, Norvig P, *Artificial Intelligence, A Modern Approach* (3rd edn, Pearson Education 2016)

Saeed W, Omlin C, 'Explainable AI (XAI): A systematic meta-survey of current challenges and future opportunities' (2023) Vol 263 Knowledge-Based Systems

- Sanders N, 'A Balanced Perspective on Prediction and Inference for Data Science in Industry' (2019) Iss 1.1 Harvard Data Science Review
- Sartor G, Lagioia F, 'The impact of the General Data Protection Regulation (GDPR) on artificial intelligence' (2020) Study for the European Parliament's Panel for the Future of Science and Technology
- Savin A, *EU Telecommunications Law* (Elgar 2018)
- Sax M, *Between Empowerment and Manipulation* (Kluwer Law International B.V. 2021)
- Scantaburlo T, Charlesworth A, Cristianini N, 'Machine Decisions and Human Consequences' in Karen Yeung and Martin Lodge (eds) *Algorithmic Regulation* (OUP 2019)
- Schabas W, *The European Convention on Human Rights: A Commentary* (OUP 2015)
- Schäfer B, 'Information Quality and Evidence Law: A New Role for Social Media, Digital Publishing and Copyright Law?' in Luciano Floridi, Phyllis Illari (eds) *The Philosophy of Information Quality* (Springer Nature 2014)
- Schauer F, *Profiles, Probabilities, and Stereotypes* (Harvard University Press 2006)
- Schelter S, 'Amnesia – A Selection of Machine Learning Models That Can Forget User Data Very Fast' (Conference on Innovative Data Systems, Amsterdam, January 2020)
- Schermaier M, 'Bona Fides in Roman Contract Law' in Reinhard Zimmermann, Simon Whittaker (eds) *Good Faith in European Contract Law* (CUP 2000)
- Schneider F, Friesinger G, 'Technology v Technocracy' in Günther Friesinger and Jana Herwig (eds) *The Art of Reverse Engineering* (transcript Verlag 2014)
- Schönherr L et al, 'Unacceptable, where is my privacy? Exploring Accidental Triggers of Smart Speakers' (2020)
- Schovsbo J, 'The Directive on trade secrets and its background' in Jens Schovsbo, Timo Minssen and Thomas Riis (eds) *The Harmonization and Protection of Trade Secrets in the EU* (Edward Elgar Publishing 2020)
- Selbst A, Powles J, 'Meaningful information and the right to explanation' (2017) Vol 7 Iss 4 International Data Privacy Law
- Serban I et al. 'A Deep Reinforcement Learning Chatbot' Montreal Institute for Learning Algorithms (2017)
- Shan H, 'Towards High Performance and Efficient Brain Computer Interface Character Speller: Convolutional Neural Network based Methods' Dissertation Universiteit Leiden 2020
- Shemtov N, *Beyond the Code: Protection of Non-Textual Features of Software* (OUP 2017)
- Shi Z, *Advanced Artificial Intelligence* (World Scientific 2011)
- Shu L et al, 'A Review of Emotion Recognition Using Physiological Signals' (2018) Vol 18 Iss 7
- Smith S, 'In Defence of Substantive Fairness' (1996) Vol 112 Iss 1 Law Quarterly Review
- Sohn C, Alpert M, 'Emotion in Speech: The Acoustic Attributes of Fear, Anger, Sadness, and Joy' (1999) Vol 28 No 4 Journal of Psycholinguistic Research
- Sokolova A, Konushin A 'Methods of Gait Recognition in Video' (2019) Vol 45 No 4 Programming and Computer Software
- Solove D, 'Data Is What Data Does: Regulating Use, Harm, and Risk Instead of Sensitive Data' (2024) Vol 11 No 4 Northwestern University Law Review 1081 - 1138

- Song C, Ristenpart T, Shmatikov V, 'Machine Learning Models that Remember Too Much' (2017) in Bhavani Thuraisingham et al (eds) *Proceedings of the 2017 ACM SIGSAC Conference on Computer and Communications Security, CCS 2017 Dallas*
- Stanghellini G, Rosfort R, *Emotions and Personhood: Exploring Fragility – Making Sense of Vulnerability* (OUP 2013)
- Steinert S, Friedrich O, 'Wired Emotions: Ethical Issues of Affective Brain–Computer Interfaces' (2020) Vol 26 *Science and Engineering Ethics*
- Strauß S, 'From Big Data to Deep Learning: A Leap Towards Strong AI or Intelligentia Obscura' (2018) 2 (3), *Big Data and Cognitive Computing*
- Strycharz J, Ausloos J, Helberger N, 'Data Protection or Data Frustration? Individual Perceptions and Attitudes towards the GDPR' (2020) Vol 6 Iss 3 *European Data Protection Law Review*
- Sturari M et al, 'Robust and affordable retail customer profiling by vision and radio beacon sensor fusion' (2016) Vol. 81 *Pattern Recognition Letters*
- Sunstein C, 'The Ethics of Nudging' (2015) Vol 32 *Yale Journal of Regulation*
- Surblytė-Namavičienė G, *Competition and Regulation in the Data Economy* (Edward Elgar Publishing 2020)
- Susser D, Roessler B, Nissenbaum H, 'Technology, autonomy, and manipulation' (2019) Vol 8 Iss 2 *Internet Policy Review*
- Szeliski R, *Computer Vision: Algorithms and Applications* (Griets David, Schneider Fred Springer eds 2011)
- Talesh S, Mertz E, Klug H, 'Introduction to the Research Handbook on Modern Legal Realism' in Shauhin Talesh, Elizabeth Mertz and Heinz Klug (eds) *Research Handbook on Modern Legal Realism* (Edward Elgar Publishing Limited 2021)
- Tandon N, Varde A, de Melo G, 'Commonsense Knowledge in Machine Intelligence' (2017) Vol 46 No 4 *SIGMOD Record*
- Taylor J, *Practical Autonomy and Bioethics* (Routledge 2009)
- Taylor P, *Freedom of Religion UN and European Human Rights Law and Practice* (2005 CUP)
- Tene O, Polonetsky J, 'Big Data for All: Privacy and User Control in the Age of Analytics' (2013) 11 *Northwestern Journal of Technology and Intellectual Property*
- Toch E et al, 'Analyzing large-scale human mobility data: a survey of machine learning methods and applications' (2019) Vol 58 *Knowledge and Information Systems*
- Tomba K et al, 'Stress Detection Through Speech Analysis' (2018) Vol 1 *ICETE 2018*
- Tome P et al., 'Facial soft biometric features for forensic face recognition' (2015) Vol 257 *Forensic Science International*
- Tosoni L, Commentary of Article 4 (6) in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- -- 'The right to object to automated individual decisions: resolving the ambiguity of Article 22(1) of the General Data Protection Regulation' (2021) Vol 11 Iss 2 *International Data Privacy Law*
- Trallero Ocaña T, *The Notion of Secrecy* (Nomos 2021)
- Trappey R, Woodside A, *Brand Choice* (Palgrave Macmillan London 2005)
- Treleaven P et al, 'The Future of Cybercrime: AI and Emerging Technologies Are Creating a Cybercrime Tsunami' (2023)
- Trigueros D, Meng L, Hartnett M, 'Face recognition: From Traditional to Deep Learning Methods' (2018)

- Tur G et al, 'Deep Learning in Conversational Language Understanding' in Deng Li and Liu Yang (eds) *Deep learning in natural language processing* (Springer 2018)
- Turing A, 'Computing Machinery and Intelligence' (1950) Vol LIX Iss 236 *Mind*
- Tzirakis P et al, 'End-to-End Multimodal Emotion Recognition using Deep Neural Networks' (2015) Vol. 14 No. 8 *Journal of Latex Class Files*
- Usuelli M, *R machine learning essentials* (Packt Publishing 2014)
- Uuk R, 'Manipulation and the AI Act' (2022)
- Vallor S, *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting* (OUP 2016)
- Valstar M, 'Automatic Facial Expression Analysis' in Manas K. Mandal, Avinash Awasthi (eds) *Understanding Facial Expressions in Communication* (Springer 2015)
- van Canneyt T et al, 'Data Protection: CJEU case law review – 1995-2020' (2021) Vol 56 *Computerrecht*
- van der Sloot B, 'Decisional privacy 2.0: the procedural requirements implicit in Article 8 ECHR and its potential impact on profiling' (2017) Vol 7 No 3 *International Data Privacy Law*
-- -- *Privacy as Virtue* (CUP 2017)
- Van Hoecke M, *Methodologies of Legal Research: What Kind of Method for What Kind of Discipline?* (Hart Publishing 2011)
- van Lieshout M, 'The value of personal data' in Jan Camenisch et al (eds) *Privacy and Identity 2014 IFIP AICT vol. 457* (Springer 2015)
- Vandercammen L et al, 'On the Role of Specific Emotions in Autonomous and Controlled Behaviour' (2014) Vol 28 Iss 5 *European Journal of Personality*
- Veale M et al, 'Algorithms that Remember: Model Inversion Attacks and Data Protection Law' (2018) A 376 *Philosophical Transactions of the Royal Society A* 376
- Verhagen T, van Dolen W, 'The influence of online store beliefs on consumer online impulse buying: A model and empirical application' (2011) Vol. 48 *Information & Management*
- Voigt P, von dem Bussche A, *The EU General Data Protection Regulation (GDPR): A Practical Guide* (Springer 2017)
- von Grafenstein M, *The Principle of Purpose Limitation in Data Protection Laws* (Nomos 2017)
- Vorras A, Mitrou L, 'Unboxing the Black Box of Artificial Intelligence: Algorithmic Transparency and/or a Right to Functional Explainability' in Ttiana-Eleni Synodinou et al (eds) *EU Inernet Law in the Digital Single Market* (Springer Nature 2021)
- Vrabec H, 'Uncontrollable: Data Subject Rights and the Data-driven Economy' (Dissertation, Leiden University 2019)
-- --, *Data Subject Rights under the GDPR* (OUP 2021)
- Wachter S, Mittelstadt B, Floridi L, 'Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation' (2017) Vol 7 Iss 2 *International Data Privacy Law*
-- -- and Mittelstadt S, 'A Right to Reasonable Inferences: Re-Thinking Data Protection Law in the Age of Big Data and AI' (2019) No 2 *Columbia Business Law Review*
- Wajnerman Paz A, 'Is Mental Privacy a Component of Personal Identity?' (2021) Vol 15 *Frontiers in Human Neuroscience*
-- -- 'Is Your Neural Data Part of Your Mind? Exploring the Conceptual Basis of Mental Privacy' (2022) Vol 32 *Minds and Machines*

- Wallerman A, 'Towards an EU law doctrine on the exercise of discretion in national courts? The Member States' self-imposed limits on national procedural autonomy' (2016) Vol 53 Iss 2 Common Market Law Review
- Walton D, *Burden of Proof, Presumption and Argumentation* (CUP 2014)
- Wang R, Strong D, 'Beyond Accuracy: What Data Quality Means to Data Consumers' (1996) Vol 12 No 4 Journal of Management Information Systems
- Wang Y et al, 'A systematic review on affective computing: emotion models, databases, and recent advances' (2022) Volumes 83-84 Information Fusion
- Warwick K, *Artificial Intelligence: The basics* (Routledge 2012)
- Weatherill S, *EU Consumer Law and Policy* (2nd edn Elgar Publishers 2013)
- Welinder Y, Palmer A, 'Face Recognition, Real-Time Identification, and Beyond' in Selinger Evan, Polonetsky Jules, Tene Omer (eds) *The Cambridge Handbook of Consumer Privacy* (CUP 2018)
- Wen H et al, 'Neural Encoding and Decoding with Deep Learning for Dynamic Natural Vision' (2018) Vol 28 Iss 12 Cerebral Cortex
- West S, Whittacker M, Crawford K, 'Discriminating AI Systems: Gender, Race and Power' (2019) AI Now Institute
- Williams B, Brooks F, Shmargad Y, 'How Algorithms Discriminate Based on Data They Lack: Challenges, Solutions, and Policy Implications' (2018) Vol 8 Journal of Information Policy
- Wischmeyer T, 'Artificial Intelligence and Transparency: Opening the Black Box' in Thomas Wischmeyer and Timo Rademacher (eds) *Regulating Artificial Intelligence* (Springer Nature 2020)
- Wisman T, 'Privacy, Data Protection and E-Commerce' in Arno L. Lodder, Andrew D. Murray (eds) *EU regulation of e-commerce. A commentary* (Elgar 2017)
- Wood A, 'Coercion, Manipulation, Exploitation' in Christian Coons, Michael Weber (eds) *Manipulation* (OUP 2014)
- Xenidis R, 'Tuning EU equality law to algorithmic discrimination - Three pathways to resilience' (2020) Vol 27 Iss 6 Maastricht Journal of European and Comparative Law
- Yang M et al, 'Speech Reconstruction from Human Auditory Cortex with Deep Neural Networks' (Interspeech Conference, Dresden, September 2015)
- Yang Z, Zhong S, Wright R, 'Privacy-Preserving Classification of Customer Data without Loss of Accuracy' (2005)
- Yoav S et al, 'The AI Index 2018 Annual Report' (AI Index Steering Committee Stanford University 2018)
- Yoshida S, *Computer Vision* (Nova Science Publisher 2011)
- Yuste R et al, 'Four ethical priorities for neurotechnologies and AI' (2017) Vol 551 Nature
- Zanfir-Fortuna G, Commentary of Articles 13-15 and 21 in Christopher Kuner, Lee A. Bygrave, Christopher Docksey (eds), *The EU General Data Protection Regulation: A Commentary* (OUP 2020)
- Zarsky T, 'Mine your own business!' (2003) 5 Yale Journal of Law and Technology
 -- -- 'Incompatible: The GDPR in the Age of Big Data' (2017) Vol 47 Iss 4 Seton Hall Law Review
- Zbancioc M, Feraru S, 'A study about the automatic recognition of the anxiety emotional state using Emo-DB' (E-Health and Bioengineering Conference, Iasi, 2015)
- Zhan J, 'Using Homomorphic Encryption for Privacy-Preserving Collaborative Decision Tree Classification' (IEEE Symposium on Computational Intelligence and Data Mining, Honolulu 2007)

-- -- et al, 'Emotion recognition using multi-modal data and machine learning techniques: A tutorial and review' (2020) Vol 59 Information Fusion

Zhao D et al, 'Learning joint space–time–frequency features for EEG decoding on small labeled data' (2019) Vol 114 Neural Networks

Zheng S, 'User Perceptions of Smart Home IoT Privacy' (2018) Vol 2 Proceedings of the ACM on Human-Computer Interaction

Zhi-Hua Z, Ji F, 'Deep Forest: Towards an Alternative to Deep Neural Networks' (IJCAI Conference, Melbourne, August 2017)

Zhu B, Shin U, Shoaran M, 'Closed-Loop Neural Prostheses with On-Chip Intelligence: A Review and A Low-Latency Machine Learning Model for Brain State Detection' (2021)

Žliobaitė I, 'Measuring discrimination in algorithmic decision making' (2017) Vol 31 Data Mining Knowledge Discovery

Zuboff S, *The age of surveillance capitalism* (PublicAffairs 2019)

Zuiderveen Borgesius F, 'Improving Privacy Protection in the area of Behavioural Targeting' (Doctoral thesis, Universiteit van Amsterdam 2015)

-- -- 'Discrimination, artificial intelligence, and algorithmic decision-making' Report for the Anti-discrimination department of the Council of Europe (2019)

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