Index

3D printing, intellectual property law 414 15
AARON 516
Aarts, E. 281
Abbott, R. 490, 491, 498
Abe, N. 630
Ablin, R. 432
accelerating artificial intelligence 40–54
biological evolution comparison 49
computer power and exponential growth 43–4, 45
computer simulations 45
conceptual errors in fears about AI 48–51
data analysis possibilities 41
existential threat, dealing with 40, 49–50, 176, 213, 538
friendly AI, support for research into 40–41, 50
functionalism 42–3
hardware capacity to mimic human thought 43
information analysis 53
innovations 52
malevolence property, possibility of 49, 466–7
media interest 40
military fears 40, 46–7, 50–51, 53
natural catastrophes, predicting and preventing 53
political concerns 40, 41, 49–50, 53
risk factors 46–7
social governance and decision-making 42–3, 45, 53
software challenges 44–5
Ackerman, E. 256, 265
Adams, D. 175
Adams, R. 176
Adams, T. 201
Adebayo, J. 129
Adler, J. 50
advanced search robots, and legal personhood 244
agency concept
and autonomy, privacy, Smart Homes and robots 295–6, 304
c consumer definition, Internet of Things 562–6
creative agents 514–18
law of artificial intelligence, working towards 22–5, 37
respondeat superior liability, law of artificial intelligence, working towards, challenges to established law 25
Agrawal, A. 656, 663
Agre, P. 282–3
Aiva (Artificial Intelligence Virtual Artist) 424, 425
Ajunwa, I. 586–7
Al-Kofahi, K. 69, 81, 82, 83
Aletras, N. 258
Alemen, V. 63
Allain, J. 107
Allen, B. 435
Allen, C. 262, 266
Alpaydın, E. 36
AlphaGo xx
Alsever, J. 104
Amazon Dash Button 568–9
Ambrogi, R. 55
Amodei, D. 622
Anderl, S. 265
Anderson, J. 376
Anderson, K. 51, 257
Andrews, D. 320
Angwin, J. 111
animal rights 219, 226–7, 233, 236, 237, 368–9, 424–5
antitrust, algorithmic pricing and tacit collusion 624–48
biases, algorithms unlikely to exhibit 631
competition enforcer concerns 635–6
concentrated and transparent markets involving homogenous products 628–9, 633, 637
conditions for collusion 628–32
deviation detection and credible deterrent mechanism 625–6, 629–30, 635
outsider reactions unable to jeopardize the results expected from the coordination 630
super-platform's incentives 630
tacit collusion more profitable than competition 630
antitrust, algorithmic pricing and tacit collusion, and artificial intelligence 641–6
auditing regime 646
capacity 641–3
detection concerns 645–6
learning from experience 645
liability 643–5
reinforcement learning 20, 642–3
risk assessment issues 644–5
antitrust, algorithmic pricing and tacit collusion, cartels and price collusions 625–8
digital eye collusion (technological advancements amplifying tacit collusion) 627
hub and spoke collusion (single pricing algorithm to determine the market price charged by numerous users) 626–7, 633–4
hybrid collusion/discrimination 627–8
messenger collusion (humans agreeing to collude and using computers to execute their will) 626
predictable agent collusion (unilateral adoption of pricing algorithm) 627
antitrust, algorithmic pricing and tacit collusion, legality 637–41
market manipulation or unfair practice 638–9
market or sector investigations, use of 640–41
merger review focus 641
pure forms of tacit collusion 637–9
targeting abuse of excessive transparency 639–40
antitrust law, and law of artificial intelligence, working towards 25–6
Applied Dexterity 433–5, 463–7
see also surgical robotics patents, kinetic claims
Arabatzis, T. 441–2
Arbib, J. 251
Arkin, R. 257
Arkley, R. 520
armed conflict and military fears 40, 46–7, 50–51, 53, 260
Armitage, R. 416
Armour, J. 653, 654, 655
Armstrong, A. 505
Armstrong, T. 80
Arora, S. 78
art programs, creative industry, EU 515–17
Artémov, S. 75
artificial moral agents (AMAs) development, social system design 615
Asaro, P. 512, 534, 555, 614
Ashley, K. 56, 62–3, 79, 82–4
Asimov, I. 7, 224–5, 226, 307, 308, 314, 318, 609–10
Aswathappa, K. 162
Atkinson, R. 153
auditing regime, algorithmic pricing and tacit collusion 646
Austin, E. 606
automation versus artificial intelligence, intellectual property law 415–16, 419
autonomous driving 251–78
algorithm biases 259
artificial intelligence definition 255–6
benefits 251
classification 253
definition 253–4
environmental issues 252
human behavior in road traffic, problems in predicting 258–9
human supervision 253–4
Japan see Japan, AI and robot strategy, highly automated vehicles
knowledge of relevant facts 264–5
law of artificial intelligence, working towards 6, 14, 15–16, 17, 21
legal framework for artificial intelligence decision-making 256–65
outperformance of humans and accident avoidance 258
programmed not to violate traffic law 257–9, 262, 263
reliability, defining degree of 264–5
road traffic law 252
US, federal government and Artificial Intelligence Regulatory Agency (AIRA) proposal 191–2
US National Highway Traffic Safety Administration (NHTSA) 158, 159
US, secondary regulation 206
autonomous driving, crash algorithms 265–77
challenge optimizing algorithms and morality and ethics 266
death by algorithm and human dignity 268–9, 274, 276
life and death dilemmas 265–8, 269
national and international human rights law 266–7
personal characteristic bias and equal value of every life 270–72
personal characteristic bias and equal value of every life, randomization by algorithm 271–2
priority of legal values (life, health, property) 269–70
proportionality principle 270
quantitative considerations 273–4
responsibility allocation 276–7
risk specification 275–6
self-regulation 268
self-sacrifice and self-interest 272–3
autonomous driving, human operator requirements 259–62
armed conflict comparison 260
Geneva and Vienna Conventions on Road Traffic 260–2, 268
human driver requirement 260–62
intelligent agents as car drivers, amendment needed 261–2
safety aspects 261
autonomous driving, law-compliance by artificial agents 262–5
machine learning 263–4
translating law into algorithms 262–4
translating law into algorithms, self-driving cars learning from human car drivers 263–4
translating law into algorithms, top-down versus bottom-up approach 262–4
autonomy
action versus autonomous intelligence, social system design 611–12, 613
agency and autonomy, risks of undermining, Smart Homes and robots 295–6, 304
autonomous robots and legal response, Japan 115
creative industry, autonomous intelligent systems 513–14, 516–17
criminal law, mental element requirement and autonomous decision-making 401–2
degree, and legal personhood 217
and freedom of speech see US First Amendment law and freedom of speech, positive justification and autonomy-based theories
machines with autonomy, law of artificial intelligence, working towards 15–17
workplace and machine as robot 578–9
cognitive computing 56, 83
Hypo system 62–3, 64, 65, 83
Taxman system 58–62, 65, 82–3
Taxman system, no-transfers-out-of-assets test 61–2
Third Wave and contextual adaptation 57
balance between artificial intelligence and law, artificial intelligence, First Wave
complex reasoning 57
deductive human reasoning 57–62
factor representation 62–3, 64
formal argumentation theory 63–4, 65
balance between artificial intelligence and law, artificial intelligence, Second Wave
and semi-supervised learning of legal semantics 66–78
contract analysis 80
definite clause grammar (DCG) 70
differential similarity 73–80, 85–6
hand-coded extraction patterns 77
justification logics 75
Knowledge Representation (KR) and Natural Language (NL) techniques 66–70, 77, 79–80, 82, 83–4, 108
legal outcome predictions 81–2
machine learning algorithms 72–3, 77, 79–80, 82, 83–4
MNIST dataset 76, 77, 86
non-thinking machines, capabilities of 84–6
prototype coding 75, 83
quasi-logical form (QLF) 70–72, 77
state-of-the-art statistical parser 70, 72
statistical learning 57, 65
statute parsing 80–81
Uniform Commercial Code (UCC) 80–81
word embeddings and linear structure 77–8
Balcan, M.-F 3
Balkin, J. 9–10, 15, 358, 362, 505, 579, 582
Ballman, D. 14
Bambauer, J. 372
Barkow, R. 183
Barocas, S. 91–2, 93, 102, 105, 565, 587
Bayern, S. 144–54, 156, 195, 202–3, 532, 537, 538, 539–40, 664, 665
Beal, V. 21
Beard, J. 12
Beck, S. 585, 589, 610
Becker, K. 517
Behrens, P. 554
Beiker, S. 17, 251
Bekey, G. 578
Belay, N. 268
Bellia, A. 403, 658
Bench-Capon, T. 8, 63, 87, 258

Woodrow Barfield and Ugo Pagallo - 9781786439055
Downloaded from Elgar Online at 07/23/2019 02:12:49AM
via free access
Research handbook on the law of artificial intelligence

Bengio, Y. 76
Benjamin, S. 26, 27, 368, 372
Bennett, I. 214
Bensinger, R. 310
Berkeley, E. 489
Berkley, R. 451
Berman, D. 63
Bertolini, A. 216–17
Bertschinger, U. 652
Best, J. 11
BF-Programmer 517
Bhattacharyya, D. 541

Biases

- algorithms unlikely to exhibit, antitrust, algorithmic pricing and tacit collusion 631
- autonomous driving, crash algorithms 270–72
- learning algorithms and discrimination 95–7, 107, 109

Biocca, F. 297
Bishop, S. 320
Black Box concept 92, 93, 180, 182, 200, 248, 620
Blitz, M. 368
blockchains 651
Blodgett-Ford, S. 307–52
Boden, M. 516
Böglmüller, M. 577, 584, 591, 592
Bone, R. 411–27
Bongard, J. 618
Bonnefon, J.-F. 272
Borgatti, S. 45
Borocas, S. 30
Bos, J. 72
Boulware, M. 448
Bouquet de Joliniere, J. 431
Bowley, G. 150
Bowman, D. 52
Boyle, J. 514, 518
Bracha, O. 93
Brackenridge, G. 89
Brainard, T. 429
Brake, T. 492
Brandeis, L. 282, 283, 295, 309, 322–3
Branting, K. 64, 75–6
Bratton, B. 308, 310, 313
Bräutigam, P. 584
Breiman, L. 92
Brennan-Marquez, K. 93
Brenner, S. 31
Bridges, K. 339
Bridy, A. 514, 515, 521
Briggs, H. 310
Brighton, H. 42, 44
Brimoncombe, A. 395
Bringsjord, S. 515
Brockman, J. 10
Brooks, R. 258, 578
Brown, B. 201
Brown, J. 587
Brownsword, R. 295
browsewrap agreement, Internet of Things 567, 568
Brutus 515
Brynjolfsson, E. 27, 173, 176, 577, 606, 650
Burdon, M. 96
Burk, D. 43, 429
Burkett, M. 41
Burkhart, L. 214
Burri, T. 146, 149, 200, 271, 537–59, 579
Burridge, N. 650, 651
Butler, T. 525
Byrnes, N. 90
Cadwalladr, C. 169, 176, 204
Callahan, K. 9
Calo, R. 3, 5, 10–11, 13, 18, 27, 35, 158, 163, 179–80, 183, 184, 185, 186, 187, 188, 191, 199, 286, 361, 592, 597, 610
Calverley, D. 513, 532
Camenisch, J. 290
Camerone, D. 486
Canada data protection regulation 286
Law v. Canada 271
Capper, P. 58
Carmichael, S. 587
Carne, J. 492
Carone, T. 560
Carr, S. xxii
Carruthers, P. 522
cars see autonomous driving
Carson, S. 522
cartels see antitrust, algorithmic pricing and tacit collusion, cartels and price collusions
Castelvecchi, D. 645
Castro, D. 578
Cath, C. 155
Cellen-Jones, R. xx
Cemignani, M. 8
Cerf, V. 167
certification process 197–8, 249, 398
Ceruzzi, P. 167
Chakravartty, A. 442
Chance, B. 582, 588
Chander, A. 29, 375
Chandler, S. 182
Chang, K. 478, 479, 488
Chartrand, S. 435, 436
Chen, H. 22
Chen, N. 163
Cheshire Cat analogy, Naffine’s conception of personhood 232–3, 234, 235–6, 239, 249
children’s rights and legal personhood 223
Chin, A. 428–70
Choplin, D. 3
Chopra, S. 243, 360, 370–71, 658
Christaller, T. 602
Christin, A. 111
Chun, Y. 157
Ciccatelli, A. 432
Citron, D. 94, 138, 260, 364
Clark, J. 579
class actions xix, 7
clickwrap agreements, Internet of Things 567–8
Clive, E. 231
cloning, and privacy rights 344
Clopton, Z. 320–21
cobots (collaborative robots) 594–5, 596, 600
Coenen, F. 8
Coglianese, C. 88, 169, 268
cognitive computing 56, 83
Cohen, H. 201
Cohen, J. 297, 368
Cohen, M. 55
collective agreements law, workplace and workplace-related law 603–4
Collins, F. 189
Collins, M. 70, 72
Collins, R. 364
Colonna, L. 376
Colton, S. 516
Comin, D. 164
companies
artificially intelligent 539–41, 542, 544–8
commerce and contract law 27–9, 36
and Internet of Things 565–7
see also corporate law
Condon, B. 160, 176, 181
Condon, S. 333
Confino, J. 169
Conn, A. 176
Conner-Simons, A. 583
Conrad, J. 81, 82
consciousness factor 114–15, 238–9, 308, 311, 318, 402, 612, 614–15
see also intelligence role
conservation (time limitation) principle, privacy and data protection 290
consumers
financial services and underwriting
consumer credit 101–2
and Internet of Things 562–6, 569–71, 573
contracts
and Internet of Things 561, 566, 567–74, 575
and private law see private law, contract law
Cook, J. 656
coordination within corporations 654–5
Copeland, J. 513
copyright
and age of expression 423–5
authorship for works created by algorithms 35
creative industry see creative industry, EU, copyright
registration 500, 505
see also intellectual property headings; patent headings
Corbin, A. 149, 151
corporate criminal liability and forms of distributed responsibility 402–3, 404
corporate law 649–69
artificial intelligence incorporation into corporations 655–7
artificial intelligence incorporation into corporations, decision-making issues 656–7
blockchains 651
coordination within corporations 654–5
corporate bodies as legal entities 653–4
decentralized autonomous organizations (DAOs) 651–2
decentralized autonomous organizations (DAOs), Initial Coin Offerings 652
digitalisation in company law, addressing 652
directors’ authority to delegate to artificial intelligence 658–60, 663
good faith principle 651
replacement of corporate directors by artificial intelligence 663–6
replacement of corporate directors by artificial intelligence, national jurisdiction differences 664–6
replacement of corporate directors by artificial intelligence, reputation and experience requirements 664
Vital (Validating Investment Tool for Advancing Life Sciences) algorithm 403–4, 649–50, 663
see also companies; employment
corporate law, corporate director support by artificial intelligence 657–62
assisted, augmented and autonomous categories, distinction between 657
duty to delegate to artificial intelligence 660–61
information gathering delegation 660–62
instruct, supervise and control duties 660
corporate law, robo-directors 649–51
coding and machine learning effects 666–7
liability regimes 666
robo-specific appointment requirements 667
and suitable corporate legal strategies 666–7
corporate personhood 236
corporations and freedom of speech 363–4, 365, 366–7, 371
and legal personhood 228, 236
Cortez, N. 107
Covert, B. 342, 343
Craig, J. 460, 461, 462
Crane, D. 252
Crane, M. 440
Cranor, N. 571

**crash algorithms** see autonomous driving, crash algorithms

Crawford, K. 96
creative industry, EU 511–35
art and painting programs 515–17
autonomous intelligent systems 513–14, 516–17
Berne Convention 524, 525–6, 527, 531
creative agents 514–18, 532
future implications for machine creations and intellectual property 529–30
historical perspective on machine creation 523–6
legal traditions and fundamental rights 527–30
literature-generating programs 515
machine creation rights protection 513–18, 530–32
creative industry, EU, copyright 518–23, 529
computer-generated work 520–21, 524–6
creativity concept 521–3
creativity as human capacity 521–3
and fundamental rights 527–8
human authorship 519, 531
originality requirement 519, 520–21, 525
photography 520, 523–4, 525, 526, 531
Creighton, S. 431, 432
criminal acts 317, 319
artificially intelligent companies, criminal activities concerns 540–41
learning algorithms and discrimination 110–11
privacy, Smart Homes and robots 302–3
rational, responsible actor, and criminal law 235
criminal law impact 385–409
distributed responsibility 386–7
law enforcement through AI 388–99
legality principle 386
criminal law impact, AI technology used to commit crimes 386, 399–407
AI loss of self-control 404
capital evaluation errors and fraudulent bankruptcy 403–4
corporate criminal liability and forms of distributed responsibility 402–3, 404
crimes of intent 400–401, 402, 404
crimes of negligence 401, 402, 404
crimes of strict liability 400, 402, 406
denial-of-service attacks 404
drones 400, 406
experimental federalism suggestion 406
human’s mental element of an offense (*mens rea*) and material element of such a crime (*AI actus reus*), connection between 400–405
legal experimentation suggestion 407
and legal responsibility 400
logical malleability of computers and robots 404
mental element requirement and autonomous decision-making 401–2
risk management 405–7
secondary legal rules of change 405–7
criminal law impact, European Convention on Human Rights (ECHR) 386, 389
double violation question 393
evidence gathering between Articles 6 and 8 392–5
evidence gathering between Articles 6 and 8, proof assessment and algorithms 394–5
legal principles and technology, relationship between 393–4
legality requirement 392
legitimate use of data processing by public criminal authorities 391
margin of appreciation doctrine 391
necessity principle 391
preponderance-test 393
right to family life and private life (Article 8) 390–92, 393–4
right to family life and private life (Article 8), violation and use of non-validated AI system 399
transparency principle 392, 395, 397, 398
criminal law impact, European Convention on Human Rights (ECHR), right to a fair trial (Article 6 ECHR) 389, 392–3
equality of arms principle for prosecutors and defendants 395–9
independent certification of AI system’s trustworthiness 398
and privacy protection 389
rights of the data subject 398
source code disclosure 397, 398
zero-knowledge proof (cryptographic tools) 397
Crosman, P. 89
Cross, M. 395, 398
Croovitz, L. 167
Cruz, T. 160
Cubert, J. 35, 411–27
Cuende, L. 651
cultural differences 218–19, 223–4, 321–2
cyborgs see exoskeletons
Darling, K. 227
Daskal, J. 320
data protection
analysis possibilities 41
and freedom of speech 372
and future privacy see future privacy and sentient AIs, data protection and EU GDPR analysis
and Internet of Things 565–6, 573–4
learning algorithms and discrimination 91–2, 93, 105–6
legal personhood 248
and privacy see privacy and data protection sensitive data 289, 298, 299, 329–32
Smart Homes and robots 294, 302–4
and surveillance 376, 377–8, 381
US, artificial intelligence regulation 169, 194, 196, 199–201, 209
and workplace-related law see robots, workplace and workplace-related law, data protection
see also information access; privacy
Dave, R. 429
Davidson, C. 177
Davies, A. 253
Davies, C. 513
Davies, E. 513
Davis, J. 401
De Beer, D. 391
De Bruin, R. 512
De Cock Buning, M. 511–35
De Conca, S. 280–306
De Filippi, P. 651
De Hert, P. 390, 391, 392, 394, 395, 397, 398
De Schutter, O. 267, 392
De Villiers, M. 14
Deangelis, S. 2
decentralized autonomous organizations (DAOs), corporate law 651–2
deductive human reasoning 57–62
deep learning 4, 8, 15, 76, 77, 108, 116, 125, 137, 264, 415, 641–2, 645
defamatory speech, US First Amendment law and freedom of speech 369–70
definite clause grammar (DCG), and semi-supervised learning of legal semantics 70
Delbecq, B. 50
delegation, corporate law and directors’ duties 658–62, 663
DeMott, D. 23
denial-of-service attacks, and criminal law 404
Dennett, D. 43
derclayre, E. 521
descartes, R. 225, 226–7
deSmidt, B. 433
deTar, J. 89
deviation detection, algorithmic pricing and tacit collusion 625–6, 629–30, 635
Devlin, A. 428–9
Dewey, J. 223, 228
Di Marco, C. 603
Diacu, F. 53
Dick, A. 632
Diedrich, H. 651, 652
Dietz, A. 532
DiMaio, S. 430
directors, and corporate law see under corporate law
discrimination
cartels and price collusions 627–8
facial recognition and racial discrimination, Japan 116
and learning algorithms see learning algorithms and discrimination
low income consumers, and Internet of Things 575
non-discrimination principles, future privacy and sentient AIs 318–19
and workplace-related law see robots, workplace and workplace-related law, equal treatment and discrimination
disparate impact doctrine, learning algorithms and discrimination 97–100, 102–3
Dobbs, R. 3
Dockterman, E. 594
Domingos, P. 73, 295
Donohue, L. 389
Dourado, E. 165
Dowe, P. 443, 446–8
Drew, C. 53

driving see autonomous driving
drones 6

criminal law impact 400, 406
Japan 130
US, artificial intelligence regulation 158, 159, 192–3, 199, 206–7
as weapons 244–5
Drygala, T. 548
due process and opaqueness, learning algorithms and discrimination 92–5
Duffy, J. 474, 482
Dung, P. 63
Dunjko, V. xxi
Durante, M. 258, 268, 408
Dvorsky, G. 312, 314
Dworkin, R. 64, 408
Dwooskin, E. 587
Dzida, B. 583, 584, 600

Easterbrook, F. 429, 666
education issues 38, 108–9, 125
Eggerton, J. 320
Eidenmüller, H. 550, 554, 667
Eisenberg, A. 471, 479, 480
Eisenberg, M. 148, 149, 151, 651
Eisenberg, R. 469
Ekbia, H. 578
electronically stored information (ESI) for evidentiary purposes 32–3
Eletter, S. 180
Elvy, S.-A. 36, 560–76
emotional capacity 314–15, 361–2, 365
employment
human employment displacement 9–10
learning algorithms and discrimination see learning algorithms and discrimination, employment and labor
unemployment dangers 176–7, 585–6, 604–6
workplace robots see robots, workplace and workplace-related law
see also corporate law
Encarnação, J. 281
encryption software 19–20
end user license agreements (EULAs), and Internet of Things 566, 571
environmental issues, autonomous driving 252
Epstein, J. 45
Epstein, R. 163
equality of arms principle for prosecutors and defendants, and right to a fair trial 395–9
erasure right (right to be forgotten) 333
Essex, A. 192, 193
ethical considerations 124, 125, 133–5, 266, 616–17
Etzioni, A. 164, 256, 258, 264
Etzioni, O. 164, 200, 201, 203, 256, 258, 264
EU
Charter of Fundamental Rights 284
creative industry see creative industry, EU
Data Protection Directive 285–6
dignity-based approach to privacy rights 324–5
free movement of algorithms see free movement of algorithms,
General Data Protection Regulation (GDPR) 95, 199, 248
General Data Protection Regulation (GDPR) and future privacy see future privacy and sentient AIs, data protection and EU GDPR analysis
General Data Protection Regulation (GDPR), and privacy see privacy and data protection, EU, General Data Protection Regulation and personal data
General Data Protection Regulation (GDPR), privacy, Smart Homes and robots 297–301
General Data Protection Regulation (GDPR), surveillance and profiling rules 377–8
Robo Law Project 582
robot safety regulation 618–19
Unfair Terms in Consumer Contracts Directive 572
European Convention on Human Rights (ECHR)
criminal law impact see criminal law impact, European Convention on Human Rights (ECHR) on privacy 282, 284
proportionality principle 319, 390–91
European Court of Human Rights (ECHR)
Al Khawaja and Taheri v. UK 393
Ashby Donald v. France 529, 534
Brandstetter v. Austria 396
Dan v. Moldova 393
Gäfgen v. Germany 393
Goktepe v. Belgium 260
Khan v. UK 396
Klass v. GFR 392
Kokkinakis v. Greece 392
Kress v. France 396
Kruslin v. France 392
M. C. v. Bulgaria 391
Montovanelli v. France 260
Pretty v. United Kingdom 267
Silladín v. France 391
X and Y v. The Netherlands 391
European Court of Justice (ECJ)
Adoui 554
Ahlström Osakeyhtiö v. Commission (Wood Pulp II) 637, 638
Apothekerkammer 552
Asociaciōn Profesional Elite Taxi v. Uber Systems Spain 626
Bachmann 556
Bezpečnostní softwarová asociace 519, 533
Bouchereau 554
Cadbury Schweppes 547, 555
Cartesio 544–5
Centros 545, 554
CISAC v. Commission 638
Commission v. Belgium (bio labs) 552
Commission v. Belgium (insurance taxation) 556
Commission v. France (bio labs) 552
Commission v. Germany (hospital pharmacies) 552
Daily Mail 539, 544, 545, 546
Danske Dagblades Forening 519
Deutscher Apothekerverband v. Doc Morris 551
Eman and Sevinger 544
Eva-Maria Painer v. Standard Verlags 519, 533
FA Premier League v. Karen Murphy 519, 533
Football Dataco v. Yahoo! 519, 520, 533
Futura 556
Gebhard 550, 557
Google ‘right to be forgotten’ case 333
Infopaq 520, 525, 528, 533
Inspire Art 548, 554
Jany 554
Josemans 554
Lankhorst 556
Liga Portuguesa and Bwin 550, 556
Re. Lindqvist 288
Micheletti 538, 543
National Grid 547
Omega 554
PJ Hotels v. Commission 637, 638
Patrick Breyer v. Bundesrepublik Deutschland 327
Promuseca 529
Rewe-Zentral (Cassis de Dijon) 545
Rottmann 538
Säger 550, 551
Sas Institute v. World Programming 520
Scarlett Sabam 529, 534
Spain v. United Kingdom (Gibraltar) 544
Thin Cap 555
Ueberseering 545–8, 553, 554, 556, 557
UPC Telekabel Wien 529, 534
Vale 547, 548
Van Duyn 553–4
Evans, D. 560
Evans, L. 270
existential threat, dealing with 40, 49–50, 176, 213, 538
exoskeletons 580–81, 589–91, 593–4, 596, 599–600, 605–6
see also robots, workplace and workplace-related law
Ezrachi, A. 25, 624–48
facial recognition and racial discrimination, Japan 116
Faggella, D. 560
fair and lawful processing principle, privacy and data protection 288–9
fair trial see criminal law impact, European Convention on Human Rights (ECHR), right to a fair trial
Farahany, N. 18–19
federal regulation, US see US, artificial intelligence regulation, primary regulation, federal government and Artificial Intelligence Regulatory Agency (AIRA) proposal
federalism disputes, US 209
experimental xxvi–xxvii, 406
Feinberg, J. 359, 360
Feist, G. 522
Feldman, M. 587
Ferguson, A. 137, 381
Ferruer, M. 164
Ferro, S. 160–61
Ferucci, D. 515
finality principle, privacy and data protection 289, 299
financial services industry see learning algorithms and discrimination, financial services industry
Fiore, M. 560
Fischel, D. 661, 666
flash of genius test, patent law 499
Flaxman, S. 76, 180, 200
Fleckner, A. 660
Fleischer, H. 658, 660
Fletcher, G. 568
Fletcher, S. 162, 173
Flood, M. 80
Foot, P. 265, 273
forced sterilization and forced contraception, privacy rights beyond data protection 341–4
formal argumentation theory 63–4, 65
Fortado, L. 89
Francis, P. 329
Fraser, E. 610
Frass, A. 631–2
fraud, fake computer bots and fraud liability 7
free movement of algorithms, EU 537–59
freedom of establishment 544–8, 550
internal market entities 543–9
restrictions on activities of entities 550–53
free movement of algorithms, EU, personhood for AI entities 538–42
artificially intelligent companies 539–41, 542, 544–8
artificially intelligent companies, criminal activities concerns 540–41
artificially intelligent e-persons 541–2, 543–4, 546, 549
creation of a company and the tying of its “will” to an artificial intelligence 539–40
process-agreement equivalence principle 539
third person retaining power or possibility to intervene, lack of 539, 540
and US limited liability companies (LLC) law 145, 152–3, 532, 538
free movement of algorithms, EU, restrictive measures against AI entities based on their nature 551–7
abuse of the law 554–5
criminal law and effect of feelings 555
effective enforcement of the law 555–7
natural person taking blame 557
public policy and human dignity 553–4, 558
taxation 556
free will, and legal personhood 223, 225
free-rider problem, intellectual property law 413–14, 426
freedom of choice, future privacy and sentient AIs 317–18
freedom of establishment, and artificially intelligent e-persons 546, 549
freedom of speech
US federal government and Artificial Intelligence Regulatory Agency (AIRA) proposal 203–5
US First Amendment law see US First Amendment law and freedom of speech
Freitas, P. 402
Freitas, R. 316
Freund, J. 444, 445
Frey, C. 508, 595
Frick, W. 583, 584
Fried, A. 344
Friedel, R. 46
Friedman, J. 29
friendly AI, support for research into 40–41, 50
Fries, M. 258
Fuller, L. 151
function creep issues, Japan 116
funding and promotion of AI research and development, US 185–90
Futreal, A. 168
future privacy and sentient AIs 307–52
criminal acts and punishment 317, 319
cultural differences, recognizing 321–2
data protection 319–25
determining whether sentient AIs exist or will exist 310
emotions, capable of 314–15
freedom of choice 317–18
independent interests, abilities and desires 314–15
intelligence levels 315–16
interaction with human world 316
Internet access and universal right to privacy 319–25
legal rights comparable to human privacy rights 311–19
liberty-based versus dignity-based approach 321–5, 332, 347–8
malevolent or benevolent AIs, no way of predicting 310–11, 314, 315–16
non-discrimination principles 318–19
privacy rights beyond data protection 337–49
rights comparable to human privacy rights 311–13
self-determination privilege 314, 324
slavery comparison 218–19, 224, 237, 242, 243, 311–13
work capabilities 317
future privacy and sentient AIs, data protection and EU GDPR analysis 325–37
data portability right 333
erasure right (right to be forgotten) 333
natural person requirement 326, 330, 333
personal and sensitive data protection 325–9
profiling prevention 333
right to be informed 332–3
sensitive data 329–32
sensitive data, biometric data of sentient AIs 331–2
sensitive data, genetic data 330–31
sensitive data, mental health issues 332
social and mental identity 326
voluntary consent and opt-out models 334–7
future privacy and sentient AIs, privacy rights beyond data protection, procreation and sex 338–47
cloning 344
contraception access and abortion rights 339–41
forced sterilization and forced contraception 341–4
invasion of privacy tort rights 347–9
marriage involving sentient AIs 346
progeny of sentient AIs, removing 346–7
revenge porn rights 348–9
sexual relations 345–7

Gaakeer, J. 247
Garcia, M. 259
Gardner, H. 225, 466
Garfinkel, S. 406
Gawande, A. 53
Geldart, W. 215
Gelernter, D. 494
Gemignani, M. 139

genetic programming and patent system see patent system, new tool and previous patent idea, genetic programming rendering an idea obvious
Geneva Convention on Road Traffic 260–62, 268
Gergen, M. 151

Germany
autonomous driving pilot project xxvi, 407
copyright protection of computer-assisted output 525
exoskeletons and anti-discrimination legislation 590
human dignity 268, 271
human operator requirements 259–60
legality of an act and individual guilt 269
natural persons as directors 664
right to privacy and personality rights 324

Gerst, D. 595
Gestner, M. 7
Gevurtz, F. 656
Gey, S. 356
Gholz, C. 429
Ghose, T. 645
Gibbs, S. 97
Gilder, P. 231
Gillespie, T. 4
Gillette, C. 567
Ginsburg, J. 527
Glance, D. 577
Glancy, D. 253, 262
Glaucoft, J. 34
Glynn, S. 158
Goertzel, B. 612
Gogoll, J. 268, 273
Goldberg, M. 431
Golden, J. 440
Goldman, D. 303
Goldsmith, J. 377
Gomulkiewicz, B. 14
Good, J. 42, 230
good faith principle 569–70, 651
Goodall, N. 266
Goodenough, O. 80
Goodfellow, I. xix
Goodman, B. 76, 180, 199–200
Google xx, 15–16, 334, 517–18, 642, 643 ‘right to be forgotten’ case 333
Gordon, T. 63
Goss, R. 393
Gottschlich, J. 517
Gouker, D. 175
Governatori, G. 81
Grabmair, M. 72–3
Greenemeier, L. 433, 490
Greenfield, A. 281
Greenleaf, G. 96
Greer, D. 631–2
Gressel, J. 583, 584, 588, 597, 599, 605
Griffiths, J. 521
Griller, S. 544
Grimmelmann, J. 368
Groesheide, F. 527
Gross, N. 583, 584, 588, 597, 599, 605
Grover, S. 98
Gruber, M.-C. 665
Grunes, A. 625
Guadamuz, A. 491, 521
Guilhot, M. 37
Guilford, J. 522
Gunther, J. 577, 584, 592
Gunther, J.-P. 592
Gurney, J. 259, 266
Guszeza, J. 491
Gutierrez, D. 89, 90
Gutwirth, S. 390, 391, 392, 394, 395
Guyer, J. 589

Hackett, R. 564
Hafner, C. 63
Hall, R. 164
Hallevy, G. 401–2, 666
Hamilton-Piercy, M. 469
Hansmann, H. 653–4
Harada, T. 516
Harari, Y. 250, 663
Harcourt, B. 259
Harper, P. 96
Harris, J. 169
Hart, H. 161, 388, 405
Hartnett, K. 329
Hartzog, W. 130, 258
Hashimoto, T. 78
Hassanein, A.-E. 656
Hassler, S. 251
Hattenbach, B. 34
Hau, L. 27
Haustein, B. 599
Hawking, S. 504–5
Hawkins, A. 192
Hazlett, T. 177
He, Y. 509
Head, T. 344
health and healthcare
  computational screening of drug candidates 419–20
  learning algorithms and discrimination see learning algorithms and discrimination, health and healthcare
  remote medical surgery 244, 245
  US, artificial intelligence regulation 158, 159, 168
see also surgical robotics patents
  health and safety at work see robots, workplace and workplace-related law, safety at work and health protection
hearsay rules 32–3
Hegel, G. 221
Heinrichs, D. 252
Heinz, E. 492
Heitner, D. 174
HeLa cells 330–31
Heller, M. 469
Hemnes, T. 338
Henning, P. 640
Henry, A. 336
Hern, A. 92
Herrmann, K. 430
Hevelke, A. 273, 274, 275, 276
Heyns, C. 268
Hicks, J. 438
Hilb, M. 650
Hildebrandt, M. 247, 395, 402
Hillman, R. 570
Hobson, W. 174
Hodge, G. 52
Hodson, H. 599
Hoekstra, R. 63
Hoensisch, W. 524
Hof, R. 11
Hoffinan, C. 334
Hoffinan, K. 107
Hoffmann, M. 261
Hofilena, J. 580
Hofmann, K. 584, 588, 599
Holbrook, T. 495, 503
Holmes, R. 46
Hoofnagle, C. 337
Hoot, N. 90
Horn, B. 460, 461
Horstmann, N. 632
Horvitz, E. 168, 405
Horwitz, M. xix
Hrislov, K. 530, 531, 533
Hruska, J. 330
Hsu, J. 169
Hubbard, P. 3, 10, 16, 28
Huber, P. 208
Hughes, J. 313
human factor
  free movement of algorithms, EU 553–4, 557
  future privacy and sentient AIs 326, 330, 333
  law of artificial intelligence, working towards 16–17, 24
  and legal personhood see legal personhood, biological person as natural legal person
  legal personhood, Naffine's conception of personhood 233–4, 236–7, 237, 239
  mimicking human thought 43
  patent law and thinking machines 494, 499–500, 506, 507–8
  social system design for artificial intelligence 612–13, 614–16
  surveillance see surveillance, human factor
  US, artificial intelligence regulation, users 207
  US First Amendment law and freedom of speech 355–65
human rights
  autonomous driving, crash algorithms 266–7
  EU see European Convention on Human Rights (ECHR)
Hurley, M. 101
Hutchinson, A. 219
Hutson, M. 256
Hutter, J. 413
Hvistendahl, M. 109
Hwang, S. 630
Hypo 62–3, 64, 65, 83
Iliadis, L. 12
image recognition 65, 256, 259, 264–5, 294
inanimate objects, personhood rights 219, 226–7, 233, 236, 237
industry standards creation, US, artificial intelligence regulation 189
see also data protection
Inoue, H. 621
intellectual property
and creative industry see creative industry,
EU
Japan 125–6
law of artificial intelligence, working
towards 4, 33–5
and learning algorithms and discrimination 93
US regulation 194–5, 200, 201–2
intellectual property law 411–27
3D printing effects 414–15
Aiva (Artificial Intelligence Virtual Artist)
and classical music 424, 425
and animals 424–5
automation versus artificial intelligence
415–16, 419
copyright and age of expression 423–5
free-rider problem 413–14, 426
Internet effects, downloading and
distribution 414–15
Japan, AI and robot strategy 138–9, 140
Jefferson/Madison framework 412–14, 427
strong AI and mimicking functions of the
human brain 416
trademarks 425–6
intellectual property law, patents 416–23
computational screening of drug candidates
419–20
contribution of computing machines to
inventive activity 416–17
future of person-less invention 422–3
and human mental process 418
infringement by artificial intelligence
421–2
inventorship 417–20
legal right ownership 420–21
monopoly of exclusion right 416
person or machine of ordinary skill in the
art, assessment of 421
intelligence role
future privacy and sentient AIs 315–16
legal personhood 225–7
see also consciousness factor
intelligent tutoring systems (ITS), learning
algorithms and discrimination 108
Inter-American Court of Human Rights,
Velásquez-Rodríguez v. Honduras 267
International Conference on Artificial
Intelligence and Law (ICAIL) 70–77
International Court of Justice
Barcelona Traction, Light and Power
Company (Belgium v. Spain) 541
Nottebohm 541
Reparation for Injuries Suffered in the Service
of the United Nations 541, 543
international regulations for electronic agents
246–7
Internet
access and universal right to privacy 319–25
advertising impressions 28
artificial intelligence as fundamentally
different from Internet 167–70
downloading and distribution effects,
intellectual property law 414–15
early regulation 165–7, 171–2
personal jurisdiction in Internet cases 31–2
of robotic things, and legal personhood 216
Internet of Things and Article 2 of the
Uniform Commercial Code 28–9, 36,
80–81, 560–76
agreement notice standard 567–8
browsewrap agreement 567, 568
clickwrap agreements 567–8
company privacy policy 565–6
consumer definition and agency concept
562–6
contract amendments in good faith 569–70
contract distorting problems 568–70
contract terms and conditions 561, 566,
567–9, 574
contract terms and conditions, explanations
of contract terms after contract
formation process has ended 574
contract terms and conditions, reviewing
570–74, 575
contract terms and conditions,
unconscionability evaluation 571,
572–4
devices as agents of manufacturers 566–7
discrimination concerns against low income
consumers 575
end user license agreements (EULAs) 566,
571
EU Unfair Terms in Consumer Contracts
Directive 572
information collection, data retention and
conflict of interest 565–6, 573–4
public policy issues 573, 574
Restatement of the Law (Second) of
Contracts 561, 571, 572
Restatement of the Law (Third) of Agency
563, 564–6, 567
terms of the parties' agreement 562
transactions in goods 561–2
unilateral amendment provisions in
consumer contracts 569–71, 573
warranty disclaimers 570
Intuitive Surgical's monopoly 430–32, 436–7,
438, 439–40
see also surgical robotics patents
inventorship, intellectual property law, patents
417–20
Ivaldi, M. 636
Izquierdo, J. 651
Jackson, P. 83
Jacobs, F. 393, 396
Jain, L. 656
James, S. 520
Jandhyala, V. 434
Janis, M. 503
Japan
Consumer Product Safety Law 619
elderly care robots 580
Kaizen monitoring 583
Tokku (living lab) xxvi, 407, 616
Japan, AI and robot strategy 114–42
autonomous robots and legal response 115
drones 130
facial recognition and racial discrimination
116
function creep issues 116
hacking 141
industrial policy 118–19
information security countermeasures
140–41
intellectual property law 138–9, 140
law enforcement and government administration and Big Brother effect
137–8
liability for illegal actions under tort law 115
liability involving accidents with self-driving cars 139
New Robot Strategy and demographic changes 118–19
New Robot Strategy and innovation focus 120, 121, 124
New Robot Strategy and robot revolution 119–20
open data sources 137
private sector use 138–40
public sector use 136–8
research trends 133–6
research trends, AI Society Study Group on social impact 135
research trends, Japanese Society for Artificial Intelligence and ethical guidelines 133–5
research trends, Robot Law Study Group (The Information Network Law Society) 133–6
robot coexistence society 114–15
robot definitions 116–18
robots and self-consciousness 114–15
security and safety issues 140–41
special zones for structural reform 130–33
Third-Generation AI Boom 115–16
Japan, AI and robot strategy, governmental policy on artificial intelligence 118–27
Advisory Board on Artificial Intelligence and Human Society 124–5
Artificial Intelligence Technology Strategy Council and Industrialization Roadmap 123–4
data distribution environmental improvement 126–7
economic, educational and ethical issues 124, 125
industrial sector considerations 127
intellectual property protection 125–6
legal issues 124–5
Ministry of Economy and Trade Industry (METI) involvement, Target-Backward Road Map 126
Ministry of Internal Affairs and Communications (MIC) involvement 121–3
networking issues 121–2
R&D guidelines 121–3, 125
risk assessment 121–2
Science and Technology Basic Plan (2016–2020) 120–21
social issues 125
Japan, AI and robot strategy, highly automated vehicles 115–16, 127–30
governmental policy 127–8
liability involving accidents with self-driving cars 139
National Police Agency involvement 128–9
national strategic zones for Level 4 automated vehicles 133
public road demonstration experiments 129
stakeholder involvement 128
Strategic Innovation Creation Program (SIP) 129–30
Jauden, A. 176
Joh, E. 138
Johnson, A. 172
Johnson, D. 321
Johnson, G. 44, 478
Johnson, S. 498
Johnson, T. 432
Johnston, C. 180
Jöhri, Y. 601
joint inventions, patent law and thinking machines 498–500, 502
Jones, C. 164
Joy, B. 46, 47
Judicata 69
Woodrow Barfield and Ugo Pagallo - 9781786439055
Downloaded from Elgar Online at 07/23/2019 02:12:49AM
via free access
Kälin, W. 267, 269, 271, 274
Kamarinou, D. 292, 377
Kamba, T. 630
Kamp, H. 72
Kaplan, J. 655
Karnow, C. xviii–xxiii, 7, 15, 17, 21, 24, 35, 203, 403, 591, 592
Kato, H. 516
Katz, D. 81
Katz, M. 178
Keats, J. 479, 480, 481, 484, 485, 487, 488, 490
Kelley, R. 614
Kelly, J. 56
Kelly, K. 12
Kelsen, H. 218
Kerr, I. 592
Kerr, O. 321, 389
Kersten, J. 541, 557
Khanna, D. 163
Kiänička, M. 584
Kim, K.-H. 182
Kim, N. 566, 567, 568, 571, 574
Kim, P. 93–4, 105, 106, 565
Kim, S. 630
kinetic claims, surgical robotics patents see surgical robotics patents, kinetic claims
King, B. 174
King, J. 215
Kirchner, L. 92, 98
Kirsner, S. 174
Kitch, E. 429
Kiva Systems 579–80
Klindt, T. 584
Kluppel, K. 346
Knapp, V. 652
Knepper, W. 660
Knight, W. 256, 264, 560
Knowledge Representation (KR) and Natural Language (NL) techniques 66–70, 77, 79–80, 82, 83–4, 108
Knox, R. 169
Ko, L. 342
Koene, A. 397
Kohlhepp, P. 472, 479, 480, 482, 486, 488
Koops, B.-J. 31, 282, 283, 284, 300
Kopp, D. 587
Kort, F. 81
Kotsoglou, K. 258
Kowalski, R. 79
Koza, J. 480, 486, 493
Kraakman, R. 654
Kravets, D. 201, 320
Kroll, J. 94, 397, 565, 584, 587, 588, 667
Kudyba, S. 656
Kumar, A. 178
Kunaki.com 426
Kuncel, N. 588
Künzli, J. 267, 269, 271, 274
Kurzweil, R. 11, 12, 44, 46, 52, 310, 479, 493, 505, 514, 518, 612
Labruto, R. 582
Lafrance, A. 564
Land, M. 357
Larsson, S. 313
Latson, J. 9
Launchbury, J. 65, 73
law, balance with artificial intelligence see balance between artificial intelligence and law
law of artificial intelligence, working towards 2–39
analog technology versus digital technology 13, 21, 36
cars 15–16, 17, 21
human operator required to share control of the system 16–17, 24
intellectual property law and authorship created by algorithms 4
machines with autonomy 15–17
mens rea of artificial intelligence controlling a machine 18–20
open training data and open data standards in artificial intelligence 37–8
products liability law and algorithms and software 13–15, 24, 28, 37
robots 13–14
robots as software that teaches itself 17, 18–19, 25, 36, 37
self-incrimination doctrine 19
self-programming and unpredictable solutions 15–16, 24
tort law 14, 20
law of artificial intelligence, working towards, challenges to established law 22–35
agency law 22–5, 37
antitrust law 25–6
commerce and contract law 27–9, 36
commerce and contract law, algorithms and software considered as goods or a service 28–9
commerce and contract law, internet advertising impressions 28
commerce and contract law, Uniform Commercial Code (UCC) 28–9, 36
constitutional protection (employment law) and discriminatory practices by algorithms 29–30
copyright law and authorship for works created by algorithms 35
electronically stored information (ESI) 32–3
First Amendment law and speech technology 26–7
hearsay rules 32–3
intellectual property 33–5
jurisdiction issues 30–32, 37
jurisdiction issues, geography-based, and borderless boundaries of cyberspace comparison 31
jurisdiction issues, personal jurisdiction in Internet cases 31–2
patent law 33–5
law of artificial intelligence, working towards, transformative technology and liability issues 4–12
autonomous vehicles 6, 14
class actions 7
crime processing power 11
drones 6
human employment displacement 9–10
human interaction simulation, fake computer bots and fraud liability 7
human-like artificial intelligence mimicking human levels of general intelligence 11–12
machines devoid of intelligence 5
negligence and products liability 6–7, 24
predictions about the future direction of technology 9–12
robots 5–6
system failures 6
tort law and malpractice claims 6–7, 14

law compliance, autonomous driving see autonomous driving, law-compliance by artificial agents
Lawlor, R. 81
Le, Q. 517, 518
learning algorithms and discrimination 88–113 accountability issues 93–5
biases, systemizing existing social 95–7
cleaning processes, errors, and outages 91
data mining concerns 91–2, 93
decision-making process explanation, demands for 94
disparate impact doctrine 97–100, 102–3
due process and opaqueness 92–5
education 108–9
and intellectual property interests 93
intelligent tutoring systems (ITS) 108
machine learning techniques 88–90
Natural Language Processing (NLP) 66–70, 77, 79–80, 82, 83–4, 108
predictive analytic discriminatory impacts 96–7
privacy law and accountability 94–5
source data results 92–3
standardized tests and socioeconomic and gender bias 109
technologies have politics embodying social relations 90–91
learning algorithms and discrimination, employment and labor 103–6
data classification structures 105–6
definition and translation problems 105
demographic information, ignoring 104
discrimination potential 104
employment fairness and discriminatory effects 105–6
monitoring employees 104, 583, 598–601
personally identifiable information exclusion 104
predictive algorithms and recruitment 103–4
social networking data 92, 102, 105
training data 105
learning algorithms and discrimination, financial services industry 100–103
data that reflects existing human biases 101–2
disparate impact claim 102–3
and Equal Credit Opportunity Act (ECOA) 102–3
failure to distinguish causation from correlation 102
underwriting consumer credit 101–2
learning algorithms and discrimination, health and healthcare 106–8
collected data errors 107
healthcare robotics 106–7
input bias 107
privacy issues 107
systematic incentives 107–8
learning algorithms and discrimination, legal system 109–11
criminal sentencing 110–11
forensic analysis 110
predictive policing systems 109–10
Index 687

risk assessment methods, criticism of 111
violent crime forecasting 111
LeBlanc, L. 90
LeCun, Y. 76
Lee, E. 439
Lee, N. 432
Lee, P. 442, 497
Leenes, R. 258, 262, 264, 268, 280–306, 405
Lefstin, J. 429

legal actor, robot as see legal personhood, robot as legal actor

legal personality
artificial intelligence entity and private law 152–3
and US First Amendment law and freedom of speech 360–61, 370–71

legal personhood 213–50
artificial legal person meaning 216
certification process 249
cultural differences 218–19
data sharing and protection 248
and degree of autonomy 217
future direction 247–50
Internet of robotic things 216
legal actors with legal capacity 215–16
natural person meaning 215–16, 218–19
non-natural (artificial) legal persons, corporations 228, 236
personhood rights for animals and inanimate objects 219, 226–7, 233, 236, 237
and reflexive governance 214
robots 216–17
slavery comparison 218–19, 224, 237, 242, 243, 311–13
social necessity question 216, 240
subjective rights that typically result from social interactions 218
sui generis structure 249
super-intelligent algorithms threat 12, 250
technology regulation and multidisciplinary approach 215
transparency requirements 248
working towards 217–20
legal personhood, artificially intelligent robot 229–32
autonomous automobiles 230–31, 241, 245–6
comparison to existing legal persons and legal objects, concerns with 232
employment and selection of candidates 231
self-thinking and self-acting AI driven systems 229
semi-autonomous functioning system 229

society’s mistrust of AI and super intelligence development 230

legal personhood, biological person as natural legal person 220–27
biotechnology and human DNA use 222–3
children’s rights and liabilities 223
cultural and national differences 223–4
free will 223, 225
freedom of decision 221
human physiology and age limits 224–5
intelligence role 225–7
rights not afforded to artificial entities 222
sovereignty aspect 41–2, 221–2
spiritual aspect 221
voting rights 224

legal personhood, Naffine’s conception of personhood 219, 232–9
Cheshire Cat analogy 232–3, 234, 235–6, 239, 249
corporate personhood 236
rational, responsible actor, AI generated robot as 237–9
rational, responsible actor, AI generated robot as, and human characteristic of consciousness 238–9
rational, responsible actor, and criminal law 235
rights for the human being 233–4, 236–7, 239
rights for the human being, and human self-interest 237

legal personhood, robot as legal actor 240–47
advanced search robots 244
attribution to natural or legal person 246
damages and liability 244
degree of legal subjectivity and legal capacity 241
drones as weapons 244–5
international regulations for electronic agents 246–7
legal acts 243–7
legal subject or legal object specialis 240–41
liability and legal subjectivity 241–3, 246
people representing institutions and organizations comparison 240
product liability 245–6
remote medical surgery 244, 245
society dependent on autonomous systems 240
vending machine example 242–3

legal rights
future privacy and sentient AIs 311–19
patent ownership 420–21

legal semantics see balance between artificial intelligence and law, artificial intelligence,
Second Wave and semi-supervised learning of legal semantics
Lehr, D. 88
Lemley, M. 43, 428, 429, 440, 497
Lerouge, J.-F. 203, 403
Leroux, C. 582
Lessig, L. 652
Lev-Aretz, Y. 88–113
Levenstein, M. 631, 632
Levy, S. 560
Lewis, D. 79
Lewis, M. 182
Li, H. 472
Li, T. 531
liability
AI technology used to commit crimes 400, 402, 406
antitrust, algorithmic pricing and tacit collusion 643–5
corporate law, robo-directors 666
Japan 115, 139
and legal personhood 241–3, 244, 246
product liability 6–7, 13–15, 24, 28, 37, 245–6
robots, workplace and workplace-related law 591–2
and transformative technology see law of artificial intelligence, working towards, transformative technology and liability issues
Libratus 642
Licklider, J. 492
Lieberman, Y. 163
limited liability companies (LLCs), private law 145, 152–3, 532, 538
limiting principles, search for, US First Amendment law and freedom of speech 365–8
Lin, A. 52
Lindor, R. 17
Lipko, H. 201
Liptak, A. 301
literature-generating programs, creative industry, EU 515
Liu, X. 490, 507
Lodder, A. 375–84
Lohmann, M. 252, 578, 592, 595, 596, 597, 599, 602
Lohr, S. 55
Loklear, M. 90
Lombardo, P. 342
Lopucki, L. 540–41, 542, 652
Lordt, A. 660, 666, 667
Lou, R. 375–84
Lovejoy, A. 237
Lubin, G. 160, 176, 181
Lucas, R. 43
Lucivero, F. 258, 262, 264, 300, 405
Lum, M. 464
Lutz, L. 261
Lützeler, M. 587
Lynch, D. 631
Lyons, D. 612
McAfee, A. 27, 173, 176, 577, 650
McCarty, J. 12, 22, 156, 157, 578, 655
McCarty, N. 513
McCarty, L. 55–87
McCorduck, P. 415, 516
MacCormick, N. 263
McCraw, T. 172–3
McCurry, J. 345
McDermott, D. 84
McDonald, A. 571
McGee, K. 174–5
McGeehan, P. 347
McGinnis, J. 38, 40–54
machine creation rights protection, creative industry, EU 513–18, 530–32
machine as inventor, patent law 498, 500, 505–8
Machlup, F. 496, 497
McLean, T. 437, 438, 469
Madison, M. 442
Magid, L. 168
Maglogiannis, I. 12
Mahlmann, M. 267, 268, 271
Mair, S. 588
Malaty, E. 414
malevolence property 49, 301–2, 310–11, 314, 315–16, 466–7
Malik, O. 8
Mandel, G. 166, 185, 198, 199
Mangan, D. 17
Manjoo, F. 160, 181
Markoff, J. xxvi, 9, 40, 55, 160, 201, 493
Marr, B. 89, 90
marriage involving sentient AIs 346
Index

Marsh, B. 343
Martin, A. 172, 173
Massaro, T. 26, 353–74
Masters, W. 50
Mathew, R. 175
Mathiason, G. 582, 586, 588, 594, 596
Matsuo, Y. 133–4
Matsyszczak, C. 565
Maurer-Lambrou, U. 587
May, E. 595
Mayer, C. 228
Mazzoleni, R. 496
Medhora, S. 343
Medin, D. 64
Mednick, S. 522
Meiklejohn, A. 357
Melamed, A. 440
Mendelson, E. 268
Mendenhall, A. 313
Menell, P. 428
Merchant, G. 17
merger review focus, antitrust, algorithmic pricing and tacit collusion 641
Metz, C. 89, 182, 350
Meyer, R. 344
Miaskoff, C. 106
Micheler, E. 546, 548
Miéville, C. 307, 313, 317, 337, 350
Mikolaj, T. 77, 78
military fears 40, 46–7, 50–51, 53, 260
Millar, J. 592
Miller, Claire 29, 580, 587
Miller, Clark 214
Miller, L. 326
Minga, L. 630
Minow, M. xix
Minsky, M. xix
Miranda, L. 35
Mitchell, C. 395
MNIST dataset 76, 77, 86
mobile servant (telepresence) robot 596
Mochales, R. 84
Modgil, S. 258
Moenk, M.-F. 84
Mogg, T. 514
Moncrieff, A. 173
monitoring of employee conduct in the workplace 104, 598–601
monkey selfie 201–2, 424–5, 518, 528
Moon, C. 603, 604
Moor, J. 404
Moor, A. 160, 199
Moor, G. (Moore’s Law) 11, 43–4, 52, 205–6, 230, 493
Moor, J. 11
Moorhead, S. 515, 516
Morand, A. 655
Moravec, H. 44
Mordvintsev, A. 517
Morgenstern, L. 81
Morosow, E. 257
Morris, D. 564
Möslein, F. 547, 649–69
Moss, G. 345
Mosch, A. 413, 495
Muggleton, S. 45
Müller, J. 268, 273
Müller, M. see Lohmann, M.
Müller, R. 662
Müller-Hengstenberg, C. 583
Mungroo, P. 395
Muñoz, D. 427
Murray, A. 376
music, AI-generated 424, 425
Naffine, N. see legal personhood, Naffine’s conception of personhood
Nard, C. 472, 473, 476, 477, 482, 484
Natsui, T. 118
natural catastrophes, predicting and preventing 53
Natural Language (NL) techniques 66–70, 77, 79–80, 82, 83–4, 108
necessity principle, European Convention on Human Rights (ECHR) 391
negligence and products liability 6–7, 24
Negnevitsky, M. 20
Nelson, R. 496
Netherlands
copyright law 519
Endstra Tapes 519
legal personhood 218
legal rights of animals 227
privacy rights 284–5
Neumann, U. 265, 272
Neurolink 231
New, J. 578
New Zealand, Dairy Containers v. NZI Bank 659
Newell, A. 43
Newell, B. 375
Newell, S. 375
Newhall, B. 524
Newman, J. 320
Newmann, N. 29
Next Rembrandt 515
Ng, I. 383
Ng, K. 90
Nguyen, T. 31
Nickless, R. 588
Nida-Rümelin, J. 273, 274, 275, 276
Nilsson, N. 73, 156
Nissenbaum, H. 565
non-discrimination see discrimination
non-thinking machines, capabilities of 84–6
Norton, H. 26, 353–74
Norvig, P. 36, 88, 156, 157, 229, 255, 256, 263, 354
novelty requirement, patent law 501–2
Nowak, K. 297
Nussbaum, M. 361
Oberman, M. 342
obviousness requirement
patent law and thinking machines 495–6, 502–3, 506
and previous patent idea see under patent system, new tool and previous patent idea
O’Connor, R. 347
Ohlin, J. 218
Obly, A. 529
O’Keeffe, K. 174
Omohundro, S. 157
O’Neil, C. 30, 105, 321, 351, 565
Onuuforio, M. 572, 573
open data standards 37–8
open source challenge, Applied Dexterity and surgical patents 433–5
open-textured autonomous robots 611–12, 613–14, 617–18, 619, 621–2
Oppliger, R. 395
Oprey, M. 599
O’Reilly, B. 433
organizational law, private law 144, 145, 152–4
originality requirement, copyright 519, 520–21, 525
Osborne, C. 314
Osborne, M. 508, 595
outages, cleaning processes and errors 91
Packin, N. 88–113
Pahlad Singh, A. 529
Painter, R. 322
Pan, S. 297
Pandolfini, B. 156
Panos, Z. 433
Papa, R. 598, 600
Papakstantinou, V. 397, 398
Pariser, E. 304
Pärlö, K. 586, 589, 590, 598, 601, 602
Parloff, R. 491
Pasquale, F. 84, 93, 94, 138, 146, 375
patent law, law of artificial intelligence, working towards, challenges to established law 33–5
patent law and thinking machines 489–510
access to technologies 508–9
automation of examination process 503
conception of the invention 496–7
copyright registration comparison 500, 505
current tests of enablement, impact on 503
distortions to existing patent law framework 505–6
distributional consequences 507
emergence of thinking machines 490–92
exclusive rights 495
flash of genius test 499
invention paradigm change 492–4
invention paradigm change, discoveries beyond human understanding 494
invention paradigm change, speed and cost effects 493–4, 503–4
invention paradigm change, substitution for the human as inventor 494
inventor identification 497–500, 504
joint inventions 498–500, 502
machine as inventor 498, 500, 505–8
machine-human collaboration 499–500, 506
novelty requirement 501–2
obviousness requirement 486–7, 495–6, 502–3, 506
patent policy response 504–9
patenting thinking machines 509
person having ordinary skill in the art (PHOSITA) 496, 497, 501, 502–3
process by which inventions are discovered, changes to 504
substitution of machine invention for human invention 507–8
trade secret protection 507
patent system, new tool and previous patent idea 471–88
antenna technology 171–2, 471, 478–9, 480–81, 482
genetic programs 471, 478–80
patent law 472–7
US Leahy-Smith America Invents Act 473
patent system, new tool and previous patent idea, genetic programming rendering an idea obvious 480–87
counter arguments 485–7
counter arguments, designed by process of trial and error 485–6
financial cost associated with using a genetic program for this type of design 484
patent law 482–3
proportion of PHOSITAs in the field having access to genetic programs 484, 486
relevant market determination 484
thicket of trivial patents and cost factors 482–3
time and effort required to operate the necessary genetic program 485
patent system, new tool and previous patent idea, obviousness requirement 473–7
and commercial success 476, 487
long felt need and failure of others 477, 487
person having ordinary skill in the art (PHOSITA) 474–6, 480–81, 487
secondary considerations 476–7
unexpected results 477, 487
patents and intellectual property law see intellectual property law, patents
surgical robotics see surgical robotics patents
paternalism concerns, US First Amendment law and freedom of speech 356
Pearce, F. 343
Peaucellier’s Theorem, surgical robotics patents 451–4
Pennington, J. 78
Pennington, J. 78
Peppet, S. 565, 574
Perel, M. 439
Perez, R. 19
Perkon, D. 594
perpetuities, rule against, private law 154
Perry, W. 48
person having ordinary skill in the art (PHOSITA), patents 421, 474–6, 480–81, 484, 486, 487, 496, 497, 501, 502–3
personal and sensitive data protection, future privacy and sentient AIs 325–9
see also data protection
personhood for artificially intelligent entities see free movement of algorithms, EU, personhood for artificially intelligent entities
full legal personhood based on different social values and time periods 616
independent legal personhood, US First Amendment law and freedom of speech 370–71
legal see legal personhood
limited legal, US, artificial intelligence regulation 202–3, 207
Petersen, N. 267, 268, 271
Pethokoukis, J. 162
Pfeifer, R. 578, 618
Pfunder, M. 440
Philipps, L. 665
Philipps-Wren, G. 656
PHOSITA (person having ordinary skill in the art), patents 421, 474–6, 480–81, 484, 486, 487, 496, 497, 501, 502–3
photography, copyright 520, 523–4, 525, 526, 531
Piana, R. 432
Pietruszak, T. 598, 600
Piety, T. 368
Pinker, S. 361
Plotkin, R. 34, 490
political concerns, accelerating artificial intelligence 40, 41, 49–50, 53
Polonetsky, J. 109
Pons, J. 580
Popp, N. 651
Porter, M. 165
Posner, R. xviii, 379, 406, 637
Post, D. 321
Post, R. 324, 357, 362
Potters, J. 632
Prabhakar, A. 492
Prakken, H. 63, 258, 262
Pransky, J. 434
predictive systems
algorithms and employment recruitment 103–4
learning algorithms and discrimination 96–7, 109–10
preponderance-test, European Convention on Human Rights (ECHR) 393
Price, N. 107, 108
pricing, algorithmic see antitrust, algorithmic pricing and tacit collusion
Prigg, M. 319
Priluck, J. 629
privacy
European Convention on Human Rights (ECHR), right to a fair trial 389
learning algorithms and discrimination 94–5, 107
robots, workplace and workplace-related law 598–9
and sentient AIs see future privacy and sentient AIs
surveillance, security and balance of risk and exposure 383
US, artificial intelligence regulation 194, 196, 199–201, 209–10
see also data protection; safety aspects
privacy and data protection 280–306
hierarchical jurisdiction 284–5
interpretations 282–3
right to family life and private life, European Convention on Human Rights (ECHR) 390–92, 393–4
surveillance 376, 377–8
typology model 283–4, 302
privacy and data protection, EU General Data Protection Regulation and personal data 287–92
automated decision-making information 291–2, 299–300
automated processing, right not to be subject to a decision based solely on confidentiality and security principle 291
conservation (time limitation) principle 290
data controller and data processor distinction 287, 298
data minimization principle 290, 299
data quality principle 290
data subject rights 291
fair and lawful processing principle 288–9
finality principle 289, 299
household exemption 288, 298
information right 291–2
object, right to 292
privacy by design and privacy enhancing technologies 290, 300, 303
sensitive personal data 289, 298, 299
territorial scope 287–8
privacy, Smart Homes and robots 280–81, 285–6, 292–305
agency and autonomy, risks of undermining 295–6, 304
Cloud technology 294, 296, 302
criminal proceedings, possible future use in 302–3
cybersecurity 303
data protection issues 294, 302–4
EU GDPR legislative framework 297–301
hijacking and malicious actions 301–2
identity and personality development concerns 297, 303
information permeability 296
licensing agreement effect 296
placement of activities 295–6
presence persistence effects 296–7
privacy inside the home, effects on 295–7
robot assistants 293–4, 297–8, 302–3
third-party apps and software 298
voice activation and conversation recording 296–7, 302, 303–4
privacy law 144–54
algorithm/agreement equivalence principle 145, 146–50
bargain principle 147–8
commercial pressure effect 149
computerized agent role 147–8
engaging artificial intelligence 150–54
legal personality of artificial intelligence entity 152–3
limited liability companies (LLCs) law 145, 152–3, 532, 538
organizational law 144, 145, 152–4
organizational law, dead-hand control 153, 154
organizational law, freedom of contract 153
standard form terms, use of 149
statutes and delegation of government decisions 146
structural agreement, effect of one state upholding 149
trusts, wills and property 145–6, 153–4
trusts, wills and property, rule against perpetuities 154
private law, contract law 150–52
computer system creating new contracts 149–50
flexibility 145, 146–7, 148–50
fraud issues 152
software-generated contracts, issues with 150–52
third-party broker and generic, assignable contracts 150
typographical errors 151
private sector role
Japan 138–40
US 167
process-agreement equivalence principle 539
procreation and sex and privacy rights see future privacy and sentient AIs, procreation and sex
product liability 6–7, 13–15, 24, 28, 37, 245–6
profiling issues 333, 377–8, 382
see also risk assessment
proportionality principle
and armed conflict 51, 260
autonomous vehicles and crash algorithms 270
European Court of Human Rights 319, 390–91
robots, workplace and workplace-related law 587–8, 601
Prüfer, J. 280
public policy issues 168–9, 553–4, 558, 573, 574
public sector use, Japan 136–8
quasi-logical form, balance between artificial intelligence and law 70–72, 77
Quattrocolo, S. 385–409
Qudrat-Ullah, H. 656
Index

Rafiq, A. 469
Rahmatian, A. 521
Rai, A. 429
Rainey, H. 157
Rainie, L. 376
Ramachandran, G. 14
Ramalho, A. 491, 532
Ramamurthy, B. 478
Rancho Córdoba, S. 162, 164
Rannenberg, K. 252
Rao, A. 657
Raskin, M. 242
rational actors
  autonomous driving 255–6
  legal personhood 235, 237–9
Raymond, A. 258
recruitment, employment 103–4
see also employment
Reese, H. 204
Regan, T. 351
Reichenbach, H. 446
Reiley, C. 469
reinforcement learning 20, 642–3
Renée, S. 349
responsibility allocation, autonomous driving,
crash algorithms 276–7
restrictive measures, free movement of
  algorithms see free movement of
  algorithms, EU, restrictive measures
  against AI entities based on their nature
Rethink Robotics (Baxter) 579, 594–5
revenge porn rights 348–9
Reyle, U. 72
Reynolds, G. 52
Riberio, J. 9
Rice, T. 34, 478, 490
Richards, N. 10, 215, 368, 578
Richards, R. 522
Richardson, M. 73
Ricketson, S. 527
Rifai, S. 73
Riley, M. 186, 190
risk assessment
  accelerating artificial intelligence 46–7
  antitrust, algorithmic pricing and tacit
collusion 644–5
  autonomous driving, crash algorithms 275–6
  criminal law impact, AI technology used to
  commit crimes 405–7
  Japan 121–2
  learning algorithms and discrimination, legal
  system 111
  profiling issues 333, 377–8, 382
  robots, workplace and workplace-related law
  594, 596–7, 602
  surveillance and public risk assessment
  379–80, 381, 382, 383
  Rissland, E. 62, 63
  Ritchie, G. 523
  robo-directors see corporate law, robo-
directors
  robot and AI strategy, Japan see Japan, AI and
  robot strategy
  robot intelligence pyramid 610–13
  robot law pyramid 613–16
  robots
   healthcare robotics 106–7
   law of artificial intelligence, working towards
   5–6, 13–14, 17, 18–19, 25, 36, 37
   and legal personhood see under legal
   personhood
   and Smart Homes see privacy, Smart Homes
   and robots
   surgical see surgical robotics patents
   US, artificial intelligence regulation 158,
   159, 160
  robots, workplace and workplace-related law
  577–608
  autonomy and machine as robot 578–9
  collective agreements law 603–4
  data analysis and optimisation of working
  processes 584
  dismissals and mass redundancies 585–6,
  604–6
  elderly care sector 580
  employer responsibility 583–4
  exoskeletons 580–81
  legal consequences 581–2
  logistics and transportation sector 579–80
  rights to issue instructions 584–5, 605–6
  robo bosses 583–6
  services sector 580
  wages and working times 602–3
  robots, workplace and workplace-related law,
data protection 597–602
  cobots (collaborative robots) 594–5, 596, 600
  data processing 600–601
  exoskeletons 599–600
  monitoring of employee conduct in the
  workplace 104, 583, 598–601
  privacy right of the affected person 598–9
  risk assessment 602
  transparency principle 600–601
  robots, workplace and workplace-related
  law, equal treatment and discrimination
  586–91
  disabilities and social insurance 589–90
  exoskeletons 589–91, 605–6
  hiring process 586–9
  hiring process, and data processing 587–8
hiring process, and proportionality principle 587–8
robots, workplace and workplace-related law, safety at work and health protection 591–7
collaborative robots (cobots) 595, 596
employers’ liability for accidents at work and occupational illnesses 592–3
exoskeletons 593–4, 596
interaction between workers and robots 594–5
mobile servant (telepresence) robot 596
personal care robots 595–6
risk assessment issues 594, 596–7
robot liability issues 591–2
Rodewalt, J. 662
Roncero-Menendez, S. 90
Rönau, T. 269, 272
Roosa, S. 34
Rose, J. 351
Rosen, D. 525, 532
Rosen, Jacob 433, 434–5, 463, 464, 465, 467
Rosen, Jeffrey 323
Roth, A. 111
Rothman, D. 176
Roth, I. 594
Rothman, D. 176
Rusch, L. 567, 571, 572
Russell, S. 36, 88, 156, 157, 229, 255, 256, 263, 264, 290
Rustad, M. 572, 573
Rutecki, G. 342
Ryzt, R. 395
safety aspects
safety at work see robots, workplace and workplace-related law, safety at work and health protection
social system design see under social system design for artificial intelligence
US, artificial intelligence regulation 198–9
US First Amendment law and freedom of speech 364–5, 366–8, 371–2
see also privacy
Safir, M. 236
Salmon, W. 443–4, 445, 446–7, 448, 465
Salsbury, S. 172
Salvini, P. 614
Samore, W. 471–88
Samsung smart products 293, 296, 303–4
Samuelson, P. 525, 532
Santayana, G. 309
Santelices, M. 109
Santolaya, P. 390
Santorelli, M. 177
Sartor, G. 63, 258, 403
Sassoli, M. 257
Satariano, A. 89, 100
Saver, R. 469
Scala, V. 391
Scarborough, R. 47
Schaerer, E. 232
Schafer, B. 610
Schafer, J. 448
Schafer, F. 354
Scheier, C. 578
Scherer, M. 35–6, 156, 161, 179, 184, 195–6, 197, 198, 208
Schimelman, B. 263
Schlackman, S. 515
Schlossberg, T. 343
Schmitt, M. 257
Schneider, R. 338
Scholz, L. 148, 652, 658
Schottmüller, C. 280
Schrage, M. 95
Schubert, G. 81
Schuller, A. 88
Schulz, J. 96
Schwab, K. 172
Searle, J. 43
Seba, T. 251
security see privacy; safety aspects; surveillance
Seethaler, F. 598
Segrave, K. 242
Seiler, B. 589, 596
Selbst, A. 30, 91–2, 93, 94, 102, 105, 565, 587
self-determination privilege, future privacy and sentient AIs 314, 324
self-programming and unpredictable solutions 15–16, 24
Selina, H. 42, 44
Selyukh, A. 6, 178
Senior, J. 663
sensitive data protection 289, 298, 299, 329–32
see also data protection
sentient AIs and future privacy see future privacy and sentient AIs
Sepinuck, S. 567, 571, 572
Seppala, T. 301
sex and procreation, and privacy rights see future privacy and sentient AIs, privacy rights beyond data protection, procreation and sex
Seymore, S. 442, 468
social system design for artificial intelligence 609–23
action versus autonomous intelligence 611–12, 613
artificial moral agents (AMAs) development and superintelligence 615
Black Box concept 92, 93, 180, 182, 200, 248, 620
full legal personhood based on different social values and time periods 616
human-based intelligence (strong AI) 612–13, 614–16
law and ethics intersection considerations and Humanoid Morality Act proposal 616–17
open-textured autonomous robots 611–12, 613–14, 617–18, 619, 621–2
Privacy by Design concept 620–21
robot intelligence pyramid 610–13
robot law pyramid 613–16
safety issues, human-robot co-existence 621–2
safety issues, legal requirement for computer vision 622
safety issues and Robot Safety Governance Act proposal 617–19
technological singularity 612–13, 615–16
Solis, M. 469
Solmon, L. 172
Solove, D. 383
Solum, L. 7–8, 24, 42, 218, 234, 237, 238, 359, 360, 362, 402, 513, 532, 665
Somin, I. 47
source code disclosure, European Convention on Human Rights (ECHR), right to a fair trial 397, 398
sovereignty aspect legal person 41–2, 221–2
Spaeth, H. 82
Spafford, G. 406
Sparapani, T. 432, 438–9
speech, freedom of see US First Amendment law and freedom of speech
speech (voice) recognition 65, 289, 294, 296–7, 302, 303–4
Spellman, F. 159
Spindler, G. 592
Sprague, R. 96
Sridharan, N. 59
Starr, N. 271
Starr, S. 260
Statt, N. 334
Steffen, R. 459
Stone, A. 493
Snyder, T. 97
social governance and decision-making 42–3, 45, 53
social and mental identity of AIs 326
social necessity question, legal personhood 216, 240
social networking data
learning algorithms and discrimination 92, 102, 105
NSA Social Network Analysis 379–81, 382–3

Woodrow Barfield and Ugo Pagallo - 9781786439055
Downloaded from Elgar Online at 07/23/2019 02:12:49AM
via free access
Stone, P. 90, 155
Strandburg, K. 468
Strickland, D. 159
Strine, L. 651
Stucke, M. 25, 624–48
Suetens, S. 632
Sullivan, K. 356
Summers, R. 263
super-intelligent entities 12, 250
Surdeanu, M. 81, 82
Surden, H. 80, 111, 255, 256
surgical robotics patents 428–70
kinematic foundations of robotics 459–62
patent trolls and patent privateers 435–41
Peaucellier’s Theorem 451–4
Pythagorean Theorem as unpatentable 449–51
Yates’s linkage and sources of mathematical intuition 454–8
see also health and healthcare
surgical robotics patents, kinetic claims 430–41
and abstract ideas exclusion 441–59, 465
Applied Dexterity 433–5, 463–7
and causal process theories 443–9
making of kinetic surgical robots claim 459–67
making of kinetic surgical robots claim, manipulator tool 459–64
Minkowski diagrams 445–6
pseudo-processes 446–8
space-time diagrams 444–8
surveillance 375–84
EU GDPR, profiling rules 377–8
legislation and algorithm stages 379–80
NSA Social Network Analysis 379–81, 382–3
numerical limits, importance of 382–3
privacy and data protection 376, 377–8
privacy versus security and balance of risk and exposure 383
public risk assessment 379–80, 381, 382, 383
see also security
surveillance, human factor 380–82
AI not human comprehension 382
classification risk 382
personal data use 381
processing methods 381–2
profiling risk 382
Suslow, V. 631, 632
Susskind, D. 55–6, 57, 65, 84–5, 86
Susskind, R. 55–6, 57–8, 65, 84–5, 86
Suzuki, W. 131
Swan, M. 651
Swanson, S. 321
Sweden, autonomous driving pilot project xxvi, 407
Swedoff, R. 101
Sweeney, L. 259
Sweeney, L. 96
Swetlitz, I. 311
Switzerland, robots in the workplace see robots, workplace and workplace-related law
Tabuchi, H. 17
Takeno, J. 10
Taleb, N. 45
Tang, J. 328–9
Tanz, J. 256
Taxman 58–62, 65, 82–3
telepresence (mobile servant) robot 596
Teller, A. 307, 316, 317, 330
Telman, D. 566, 574
Tene, O. 109
Terry, N. 107
Teubner, G. 665
Thierer, A. 163, 164, 165, 166, 167–8, 176, 185, 205, 375
Thomson, J. 265, 273
Thurnher, J. 257
Tiedje, J. 542, 546, 547, 549
Tierney, M. 172
Tita, B. 484
TiVo 304
Tjong Tjin Tai, E. 214
Tobe, F. 433, 579
Tomuschat, C. 269
Tononi, G. 238
Torrance, A. 437, 438
tort law 6–7, 14, 20, 208, 347–9
trade secret protection, patent law 507
trademarks, intellectual property law 425–6
Tran, T. 645
transparency principle 248, 392, 395, 397, 398, 600–601, 639–40
Triedman, J. 55
Trup, J. 17
trusts, wills and property, private law 145–6, 153–4
Trütten, D. 546, 548, 555
Tson, M. 10
Turing, A. 156, 226, 247, 310, 314, 345, 514
Turn Inc. 336–7
Turner, K. 55
Turtle, H. 79
Tynan, D. 14
UK
Copyright, Designs and Patents Act 520–21, 531
copyright protection of computer-assisted output 525, 526, 531
Darcy v. Allin 411
Dorchester Finance Co. v. Stebbing 661
HL Bolton (Engineering) v. TJ Graham 657
Horncastle 393
Land Credit Co of Ireland v. Lord Fermoy 661
natural persons as directors 664
SAS v. WPL 520
Selangor United Rubber Estates v. Cradock 661
unconscionability evaluation 571, 572–4
unemployment see under employment
Uniform Commercial Code, and Internet of Things see Internet of Things and Article 2 of the Uniform Commercial Code
US
anti-discrimination statutes 271
Civil Rights Act 97, 98, 105
copyright law and authorship 527–8
Defense Advanced Research Projects Agency (DARPA) 46
Equal Credit Opportunity Act (ECOA) 94, 102–3
Fair Credit Reporting Act (FCRA) 94
Federal Rules of Evidence (FRE) 32, 33
forced sterilization 341–3
Gramm-Leach-Bliley Financial Services Modernization Act 19–20
Health Insurance Portability and Accountability Act (HIPAA) 19
intellectual property law see intellectual property law
limited liability companies (LLCs) 145, 152–3, 532, 538
revenge porn rights 348–9
right to privacy doctrine 322–3, 332
right to privacy in procreation 339–41
tort law 6–7, 14, 20, 208, 347–9
Uniform Electronic Transactions Act (UETA) 23–4
Uniform Trade Secrets Act 64
US, cases
A&M Records v. Napster 369
aa1484-Eight & Millis Management Corp. v. Joppich 149
Advanced Respiratory v. Electromed 457
Agency for Int’l Dev. v. All. for Open Soc’y Int’l 364
Alice Corp. v. CLS Bank International 417, 441
Alisamos v. Intuitive 439–40
American Banana Company v. United Fruit Company 30
American Broadcasting Companies v. Aereo 369
American Column & Lumber Co. v. United States 637
Apple v. Franklin 525
Arnold v. Reuther 20
In re Ashley Madison Customer Data Sec. Breach Litig. 7
Re Bally’s Grand Derivative Litigation 659
Re Barings 659
Batzel v. Smith 166
BBK Tobacco & Foods v. FDA 173
Beaulalice v. Fed. Home Loan Mortgage Corp. 102–3
Behrset v. Crown Cork & Seal USA 7
Berger v. New York 323
In re Bernhart 443
In re Bilski 443, 453
Bilski 467
Bilski v. Kappos 448, 465
Blue Spike v. Google 34
Blumenthal v. Smith 166
In re Boesch 465
Boise Cascade Corp. v. F.T.C. 639
Bonito Boats v. Thunder Craft Boats 472, 473
Bookout v. Toyota Motor Corp. 17
Bowers v. Hardwick 345–6
Bragg v. Linden Research 31
In re Brand 442
Brandenburg v. Ohio 369
Brooke Group v. Brown & Williamson Tobacco Corp. 628
Brookhill-Wilk 1 v. Computer Motion 436
Brookhill-Wilk 1 v. Intuitive Surgical 436–7
Brouse v. United States 16
Brown v. Entertainment Merchants Association 363
Buck v. Bell 341–2, 343
Burroughs Wellcome v. Barr Labs 468, 496
Burrow-Giles Lithographic Co. v. Sarony 524
Burwell v. Hobby Lobby Stores xvii 202
Carter v. Exxon Co. 72
CCS Fitness v. Brunswick Corp. 450
In re Citron 442
Cohen v. California 364
Colorado Carpet Installation v. Palermo 562
Columbia Broadcasting System v. Scorpio Music Distributors 68
Commercial Bank v. Hearn 25
Comptroller of the Treasury v. Family Entertainment Centers 5
Computer Motion v. Intuitive Surgical 431
Cordis Corp. v. Boston Scientific Corp. 457
Cordova v. World Fin. Corp. 573
Corning v. Burden 441
Cross Medical Products v. Medronic Sofamor Danek 450
Cuno Engineering v. Automatic Devices 499
Daichi Sankyo v. Apotex 475, 476
Diamond v. Chakrabarty 499, 501
Diamond v. Diehr 441, 501
In re Dillon 476, 477
District of Columbia v. Heller xviii
E. I. du Pont de Nemours & Co. v. F.T.C. 639
Eisenstadt v. Baird 339
Eisner v. Macomber 59–60, 61, 64, 65, 75, 76, 82, 86
Environmental Designs v. Union Oil Co. of California 474–5, 476, 477, 480
Executone of Columbus v. Inter-Tel xxii
FDA v. Brown & Williamson Tobacco Corp. 173
First National Bank of Boston v. Bellotti 363
In re Fisher 453
Fonovisa v. Cherry Auction 369
Gantchar v. United Airlines 603
Garcia v. Google 528
Glover School & Office Equipment Co. v. Dave Hall 562
Go2Net v. C.I. Host 28
Golden v. City of Columbus 102
Goodyear Dunlop Tires Operations v. Brown 30
Gottschalk v. Benson 450, 459
Graham v. John Deere Co. of Kansas City 473, 474, 476, 477, 486
Graver Tank v. Linde Aire Products 467–8
Gregory v. Ashcroft 179
Gregory v. Helvering 58
Griffin v. State 32
Griego v. Duke Power Co. 97, 98
Griswold v. Connecticut 323, 339, 340
GTE Midwest v. FCC 171
Guthmann v. La Vida Llena 573
Hamberger v. Eastman 347
Hamdan v. Rumsfeld xviii
Harris v. Clifford 468
Heffernan v. City of Paterson 356
Hele v. Landmark 148
Helvering v. Elkhorn Coal Co. 58
Helvering v. Gowran 62
Helvering v. Sprouse 62
Hewlett-Packard v. Bausch and Lomb 450
Ex Parte Hiyaniztu 475–6
Hotchkiss v. Greenwood 473
In re Houghton 442
Hybritech v. Monoclonal Antibodies 418, 496
Imperial Chemical Industries v. Henkel 441
International Shoe Co. v. Washington 30–31
InterVest v. Bloomberg 637
Intuitive Surgical v. Computer Motion 431, 457
In re Isacs 442
Jackson v. Metropolitan Edison Co. 267
Jacobson Bros. v. United States 475
Johnson Worldwide Assocs. v. Zebco Corp. 450
Jones v. W L M Automation 5
Joseph Burstin v. Wilson 364
J.S. v. Village Voice Media Holdings 167, 171
J.T. Eaton & Co. v. Atlantic Paste & Glue Co. 476–7
Katz v. United States 283, 302, 323, 389
Koshland v. Helvering 62
KSR Int’l Co. v. Teleflex 438, 485
Laboratory Corp. of America Holdings v. Metabolite Laboratories 438
Lagunas Nitrate Co v. Lagunas Syndicate 662
Lawrence v. Texas 346
LeRoy v. Tatham 441
Lochner v. New York xviii
Loomis v. State of Wisconsin 260
Lorillard v. FDA 173
Lorraine v. Markel American Insurance Co. 32–3
Loving v. Virginia 346
Lowell v. Lewis 441
Lynch v. Hornby 61, 75
McDonnell Douglas Corp. v. Green 99
Mahurkar Double Lumen Hemodialysis Catheter Patent Litig. 477, 487
Mayo 467
In re Merck & Co. 477
Merk & Co. v. Teva Pharmaceuticals USA 476, 487
Mergenthaler v. Scudder 496
Meyer v. Kalanick 626
MGM Studios v. Grokster 369
Monterey v. Del Monte Dunes at Monterey 70
Motorola Mobility v. Myriad France 28
Mracek v. Bryn Mawr Hosp. 16
Mueller Brass Co. v. Reading Industries 500
Naruto v. Slater 424–5, 518, 528
New Idea Farm Equipment Corporation v.
Index

Sperry Corporation and New Holland 499
New State Ice Co. v. Leibmann 406
New York Times Co. v. Sullivan 369
Newman v. Quigg 442
Nixon v. Administrator of General Services 323
In re Nuijten 447
Obergefell v. Hodges 346
Olmstead v. United States 323, 389
Omnipoint Holdings v. City of Cranston 172
Orthopedic Equipment Co. v. All Orthopedic Appliances 475
Paine, Webber, Jackson and Curtis v. Merrill Lynch, Pierce, Fenner and Smith 450
Parker v. Flook 449–50, 465
Payne v. ABB Flexible Automation 14
Peabody v. Eisner 61
People v. Scott 14
Pierse v. Post 63
Pinellas Ice & Cold Storage Co. v. Commissioner 58
Playboy Enterprises v. Netscape Communications Corp. 483
Pompeii Estates v. Consolidated Edison Co. of N.Y. 20
Popov v. Hayashi 63, 65
Quality King Distributors v. L’Anza Research International 67–9, 78
R.A.V. v. City of St. Paul 364
Reed v. Town of Gilbert 364
Ricci v. DeStefano 99, 102
Re RJR Nabisco Shareholders Litigation 661
Roe v. Wade 339, 340–41
Saint Amant v. Thompson 369
Schad v. Arizona 18
Schmerber v. California 19
Schneider v. Amazon.com 166
In re Schreiber 473
Sebastian Intl v. Consumer Contacts 68
Sewall v. Walters 496
Skinner v. Oklahoma 342
Smith v. Maryland 381
Smith v. van Gorkom 661
Snyder v. Phelps 365
Sony v. Universal City Studios 369
Sorrell v. IMS Health 26–7, 364
Spence v. Washington 372
Spokeo v. Thomas Robins 29
State of Arkansas v. James A. Bates 302
State of Minnesota v. Ari David Levine Ct of Appeals 19
State v. Dunn 33
State v. Loomis 257
Strassburger v. Commissioner 62
Stratoflex v. Aeroquip Corp. 473
Studiengesellschaft Kohle v. Eastman Kodak 436
Sugar Institute v. United States 637
In re Swartz 473
Tarasoff 332
Taylor v. Roseville Toyota 24–5
Teleflex v. Ficosa N. Am. Corp. 437
Texas Department of Housing and Community Affairs v. Inclusive Communities Project 98, 99
Thomas and Betts Corp. v. Litton Systems 467
Toro Co. v. Scag Power Equipment 457
Trustees of Dartmouth College v. Woodward 203
United States v. Alcoa 438
United States v. Alvarez 356, 364
United States v. Athlone Indas 6
United States v. Elonis 364
United States v. Jones 209, 389
United States v. Miller 302
United States v. O’Brien 371
United States v. Phellis 58
United States v. Phillip Morris USA 173
United States v. Stevens 355–6, 364
United States v. United States Gypsum 637
In re Vamco Mach. and Tool 429
Washington v. Davis 97–8
West Coast Hotel Co. v. Parrish xviii
Whalen v. Roe 323
WiAV Solutions v. Motorola 437–8
In re Winship xviii
Wyeth v. Levine 179
Zauderer v. Office of Disciplinary Counsel of the Supreme Court of Ohio 364, 366–7
Zeran v. America Online 166, 171
Zippo Manufacturing Co. v. Zippo Dot Com 31
US, artificial intelligence regulation 155–212
autonomous vehicles and National Highway Traffic Safety Administration (NHTSA) 158, 159
industrial robots and Occupational Health and Safety Administration (OSHA) 158, 159
medical procedures and Food and Drug Administration (FDA) 158, 159
robotics 158, 159, 160
US, artificial intelligence regulation, early versus later regulation 162–78
artificial intelligence as fundamentally different from internet 167–70
autonomous vehicles and accident reduction 168, 191–2
daily fantasy sports sector 174–5
data privacy 169
eyearly Internet regulation 165–7, 171–2
eyarly regulation, case for 170–77
eyarly regulation merits 163–70
governance structures and industry growth 170–71
health data and genomic sequences 168
innovation and competitiveness improvement 165
later regulation merits 163–5
private sector role 167
public policy problems, dealing with 168–9
regulation before commercial success 173–6
technological development 162–3, 164, 172–3
unemployment dangers 176–7
wealth distribution concerns 162, 164, 176
US, artificial intelligence regulation, primary regulation, federal government and Artificial Intelligence Regulatory Agency (AIRA) proposal 179–205
certification process 197–8
consistent governance requirements 191–5
coordination among government entities, regulating 195–6
Department involvement 180–83
disclosure to users that AI is not human 201
dispute resolution 196
drones and Federal Aviation Administration (FAA) 158, 159, 192–3, 199
Federal Robotics Commission suggestion 186
free speech and speech produced by AI 203–5
funding and promotion of AI research and development 185–90
industry standards creation 189
intellectual property rights 194–5, 200, 201–2
legal status of AI 194–5
limited legal personhood (legal rights to non-people) 202–3
National Science and Technology Council Committee on Technology comparison 184
personal data protection 194, 196, 199–201, 209
privacy aspects 194, 196, 199–201
product, and technology and company regulation 196–206
regulation coordination from other federal departments and secondary regulatory sources 191–205
safety aspects 198–9
stakeholder coordination 188–9, 193
technology standards versus standards of human behavior 195
US, artificial intelligence regulation, secondary regulation 206–10
autonomous technology in self-driving cars 206
court regulation and governance 208–10
drones 206–7
federalism disputes 209
human users of AI 207
limited legal personhood 207
search and seizure disputes and privacy concerns 209–10
state regulation 206–8
tort disputes 208
US First Amendment law and freedom of speech 26–7, 353–74
animal communication skills 368–9
corporations’ rights 363–4, 365, 366–7, 371
damage remedies 370–71
data as speech 372
defamatory speech 369–70
democratic participation control 358
distinction between speech and conduct 371–2
distrust of government as regulator 355–6, 366, 367
functionality test and ‘speech product’ 372
independent legal personhood 370–71
judicial remedies 370–71
legal intentionality 369
less protected speech 355–6
limiting principles, search for 365–8
non-human speakers’ rights 363–8, 369–73
non-human speakers’ rights and Free Speech Clause (speech is worth saying) 356, 357–8
paternalism concerns 356
speaker humanness, inattention to 355–65
speakers’ dignity 364
US First Amendment law and freedom of speech, positive justification and autonomy-based theories 358–63
barriers to coverage for strong AI speakers 359–61
and emotional capacity 361–2, 365
and legal personality 360–61, 370–71
robots as social actors 361, 367
Utset, M. 145
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Van den Hoven van Genderen, R. 213–50, 610</td>
</tr>
<tr>
<td>Van der Sloot, B. 378</td>
</tr>
<tr>
<td>Van Roosmalen, H. 529</td>
</tr>
<tr>
<td>Vanden Boogart, M. 52</td>
</tr>
<tr>
<td>Vardi, M. 156</td>
</tr>
<tr>
<td>Véliz, C. 308, 311</td>
</tr>
<tr>
<td>Verbruggen, F. 391, 393</td>
</tr>
<tr>
<td>Verizon Wireless 336–7</td>
</tr>
<tr>
<td>Vermont, S. 429</td>
</tr>
<tr>
<td>Verse, D. 545, 547, 554</td>
</tr>
<tr>
<td>Vertinsky, L. 34, 468, 478, 489–510</td>
</tr>
<tr>
<td>Vervael, J. 390, 396, 398</td>
</tr>
<tr>
<td>Vestager, M. 645</td>
</tr>
<tr>
<td>Vetter, G. 434</td>
</tr>
<tr>
<td>Vidaki, A. 110</td>
</tr>
<tr>
<td>Vienna Convention on Road Traffic 261–2, 268</td>
</tr>
<tr>
<td>Villalta, J. 432</td>
</tr>
<tr>
<td>Villaronga, E. 596</td>
</tr>
<tr>
<td>Vinge, V. 213, 230, 612</td>
</tr>
<tr>
<td>Virk, G. 596, 612</td>
</tr>
<tr>
<td>Vital (Validating Investment Tool for Advancing Life Sciences) algorithm 403–4, 649–50, 663</td>
</tr>
<tr>
<td>Vladeck, D. 20, 23, 24</td>
</tr>
<tr>
<td>voluntary consent and opt-out models, future privacy and sentient AIs 334–7</td>
</tr>
<tr>
<td>Von Bar, C. 231</td>
</tr>
<tr>
<td>Von Bodungen, B. 261</td>
</tr>
<tr>
<td>Von Kaenel, A. 593</td>
</tr>
<tr>
<td>Von Ungern-Sternberg, A. 251–78</td>
</tr>
<tr>
<td>Voulon, M. 242, 246</td>
</tr>
<tr>
<td>Wachenfeld, W. 256, 263</td>
</tr>
<tr>
<td>Wachter, S. 76, 292</td>
</tr>
<tr>
<td>Wagger, A. 472</td>
</tr>
<tr>
<td>Wagger, E. 433</td>
</tr>
<tr>
<td>Wager, M. 260</td>
</tr>
<tr>
<td>Wainwright, O. 514</td>
</tr>
<tr>
<td>Waldrop, M. 167</td>
</tr>
<tr>
<td>Walker, J. 564</td>
</tr>
<tr>
<td>Walker, V. 72</td>
</tr>
<tr>
<td>Wallach, W. 262, 266</td>
</tr>
<tr>
<td>Walton, D. 63</td>
</tr>
<tr>
<td>Wang, A. 427</td>
</tr>
<tr>
<td>Wansley, M. 268</td>
</tr>
<tr>
<td>Wardle, L. xiv</td>
</tr>
<tr>
<td>Warren, S. 282, 283, 295, 309, 322–3</td>
</tr>
<tr>
<td>Warsh, D. 456</td>
</tr>
<tr>
<td>Warsh, K. 46</td>
</tr>
<tr>
<td>Washington, G. 9</td>
</tr>
<tr>
<td>wealth distribution concerns 162, 164, 176</td>
</tr>
<tr>
<td>Weaver, J. 6, 18, 22, 155–212</td>
</tr>
<tr>
<td>Webber, M. 572</td>
</tr>
<tr>
<td>Weber, Lauren 587</td>
</tr>
<tr>
<td>Weber, Lori 13, 29, 37</td>
</tr>
<tr>
<td>Weber, P. 272</td>
</tr>
<tr>
<td>Wechsler, D. 225–6</td>
</tr>
<tr>
<td>Weiner, G. 6</td>
</tr>
<tr>
<td>Weinstock, R. 332</td>
</tr>
<tr>
<td>Weissmann, J. 413</td>
</tr>
<tr>
<td>Weizenboeck, E. 203, 403</td>
</tr>
<tr>
<td>Wells, S. 614</td>
</tr>
<tr>
<td>Welzel, H. 265, 273</td>
</tr>
<tr>
<td>Weng, Y.-H. 407, 609–23</td>
</tr>
<tr>
<td>Westin, A. 282, 283</td>
</tr>
<tr>
<td>Wettig, S. 592</td>
</tr>
<tr>
<td>White, L. 243, 360, 370–71, 658</td>
</tr>
<tr>
<td>Whiting, N. 159</td>
</tr>
<tr>
<td>Whitman, J. 321, 323, 324, 337, 338, 348</td>
</tr>
<tr>
<td>Wiencek, H. 312</td>
</tr>
<tr>
<td>Wiener, J. 165, 166</td>
</tr>
<tr>
<td>Wiener, N. 242</td>
</tr>
<tr>
<td>Wigglesworth, R. 89</td>
</tr>
<tr>
<td>Wildhaber, I. 280, 577–608</td>
</tr>
<tr>
<td>Wilde, R. 649, 650</td>
</tr>
<tr>
<td>Will, P. 435–6</td>
</tr>
<tr>
<td>Wilkes, G. 84</td>
</tr>
<tr>
<td>Wilkins, A. 479</td>
</tr>
<tr>
<td>Williams, K. 491</td>
</tr>
<tr>
<td>Willis, M. 342</td>
</tr>
<tr>
<td>Wilson, H. 97–8</td>
</tr>
<tr>
<td>Wilson, M. 109</td>
</tr>
<tr>
<td>Winkle, T. 251</td>
</tr>
<tr>
<td>Winkler, R. 350</td>
</tr>
<tr>
<td>Winn, J. 572</td>
</tr>
<tr>
<td>Winner, H. 256, 263</td>
</tr>
<tr>
<td>Winner, L. 90–91</td>
</tr>
<tr>
<td>Wiseman, H. 145</td>
</tr>
<tr>
<td>Wiseman, P. 160, 176, 181</td>
</tr>
<tr>
<td>Wisman, T. 375</td>
</tr>
<tr>
<td>Wisskirchen, G. 582</td>
</tr>
<tr>
<td>Withers, K. 32</td>
</tr>
<tr>
<td>Wittgenstein, L. 87</td>
</tr>
<tr>
<td>Wolff, S. 167</td>
</tr>
<tr>
<td>Woodman, H. 172</td>
</tr>
<tr>
<td>Woods, A. 321</td>
</tr>
<tr>
<td>Woodword, C. 175</td>
</tr>
<tr>
<td>workplace see employment</td>
</tr>
<tr>
<td>Wright, A. 651</td>
</tr>
<tr>
<td>Wright, R. 49</td>
</tr>
<tr>
<td>WTO Appellate Body, EC – Seal Products 553</td>
</tr>
<tr>
<td>Wu, T. 372, 377</td>
</tr>
<tr>
<td>Wyner, A. 63, 81</td>
</tr>
<tr>
<td>Yadron, D. 14</td>
</tr>
<tr>
<td>Yanisky-Ravid, S. 490, 507, 515, 516</td>
</tr>
<tr>
<td>Yates’s linkage, surgical robotics patents 454–8</td>
</tr>
<tr>
<td>Yenisey, Z. 345</td>
</tr>
</tbody>
</table>
702  Research handbook on the law of artificial intelligence

Yeung, K. 379
Yoo, J. 375
Zarsky, T. 96, 137
Zaslowsky, Y. 22
Zhou, M. 8
Zhuge, H. 281
Zimmer, C. 330, 331
Zlauvinen, G. 47
Zolgan, A. 321
Zolfagharifard, E. 491, 649, 650
Zoph, B. 517, 518
Zhang, S. 469