

INDEX

- 4Paradigm, company 228–9, 231
- AI *See* artificial intelligence
- AI National Team 247, 249, 252–4, 256, 293
- AI Plan *See* China’s National AI Plan, A New Generation AI Development Plan
- Airbnb, company, 150, 165
- Alibaba
- Cloud *See* AliYun, company
 - company 41, 44–9, 77, 227, 248, 284, 293–4
- Alipay, product 47, 172, 178, 184, 204
- AliYun, company 107, 150, 160, 249, 282–3, 333
- AlphaGo 222–3. *See also* DeepMind
- Amazon, company 265–6, 279, 283, 289, 291
- Amazon Web Services 281, 284, 305
- Ant Financial, company 47–8, 60, 178, 339
- Anti-Terrorism Law, China’s (2015) 80, 86–94, 97–8, 118
- Apache Software Foundation 297
- Apollo, open-source self-driving platform 224, 260, 295, 313–22, 325–6, 331
- Apple, company 89–91, 151, 160, 289, 305, 333
- artificial intelligence (AI) 28, 32, 209.
- See also* Deep Learning; Machine Learning
- definition of 215, 220–1
 - future 220
- government policy, Chinese 223, 238–42. *See also* China’s National AI Plan, A New Generation AI Development Plan
- GPU chips 218–47
- history 215–16
- Network Sovereignty, and 256–8
- open-source *See* open-source: AI platforms
- private sector, China’s 227–8
- public understanding 214–15
- public-private partnerships 247–9
- research 213–17, 223–4, 258, 278, 289
- Smart Cities, and 234
- AutoNavi, a Chinese online map service 188
- autonomous vehicles 254, 306, 311, 313–14, 318, 324, 341. *See also* self-driving cars
- AutonomouStuff, company 318
- ‘backdoors’ 87–93, 107, 111
- Baidu, company 41–2, 44, 48, 77, 172, 178, 224, 248–9, 272–3, 289, 293, 312, 318, 326, 331
- Apollo *See* Apollo, Baidu’s open-source self-driving platform
- EZDL 273
- PaddlePaddle *See* PaddlePaddle, Baidu’s open-source Machine Learning platform
- Bank of China 59, 156
- BATs (Baidu, Alibaba, Tencent) 61, 77, 177, 203, 228, 247, 250
- Biden, Joe 59, 71, 335

INDEX

403

- blockchain 32, 146, 220
bottom-up innovation 33–4
ByteDance, company 31, 55, 178–9, 290
- Caffe, open-source AI platform 265, 295
Cayman Islands 39–42, 45, 48, 307
CDRs *See* China depositary receipts
censorship 1, 8, 57, 65, 69, 75, 99, 152, 161, 168, 179, 201, 208, 268, 341
content 57, 73, 76–8, 159, 161–2
control 99
- Central Leading Group for Cyberspace Affairs and the State Internet Information Office 66. *See also* State Internet Information Office
- China Association for Science and Technology 225
- China depositary receipts (CDRs) 53–5, 58
- China Electronics Standardisation Institute (CESI) 113, 296
- China National Information Security Standards Technical Committee (TC260) 114, 181, 192
- China Unicom, company 228, 272
- China’s National AI Plan, A New Generation AI Development Plan 223, 240–4, 246, 253, 257–9, 290
- China’s National AI Platforms 247, 249, 251, 259, 293–6, 321
- Chinese government 28, 111, 244, 333
AI, and 211–12, 241, 256, 301, 331
data localisation 124, 152, 296
data protection 155
foreign investment, and 43, 51, 53
fuzzy logic 7, 30, 35, 330
Informatisation 64
innovation policies 22, 26, 329
open-source, and 274, 292, 327
private sector, and 15, 78, 206, 251, 258
- Cisco, company 114, 292
- CLOUD Act 2018 (US) 137
- cloud computing 4, 63, 82, 104, 107, 143, 148, 150, 153, 235, 240, 248, 262–3, 265, 275, 282–5, 294, 303, 333, 339
- CloudWalk, company 58
- Congressional Committee Encryption Working Group 91
- Cook, Tim 89
- ‘core business functions’
definition of 190–1
- ‘critical information infrastructure operators’ 100–3, 105, 115–16, 122, 197
definition of 101
- cyber security 5, 57, 65, 68, 80, 138, 162
community 69
innovation 81, 125, 153
law *See* Cyber Security Law
meaning of 73
open-source 274, 279, 303
regime 6, 74, 83–5, 94, 96, 99, 118, 125, 135, 140, 164, 180, 201
review 105–7, 113–14, 156
- Cyber Security and Informatisation Leading Small Group 65, 82
- Cyber Security Association of China (CSAC) 68–70
- Cyber Security Law
about 95
Article 37
‘critical information infrastructure operators’ *See* ‘critical information infrastructure operators’
‘important data’ *See* ‘important data’
‘network products and services’ 103
about 102–3
data exits *See* data exits (out of China)
data localisation *See* data localisation
backdoors 107–10. *See also* ‘backdoors’
background 96–8
Cyberspace Administration of China, and 68

- Cyber Security Law (cont.)
 introduction of 94–5
 Network Sovereignty, and 72
 subordinate regulations 115–21
 third-party involvement 110
 vague rules 98–107
- cyber sovereignty 5, 49, 73. *See also*
 Network Sovereignty
- Cyberspace Administration of China
 (CAC) 65–8, 82, 97–8, 104, 108,
 112–13, 115, 162, 164, 196, 198,
 228
- DARPA (research arm of US
 Department of Defense) 279
- data breach 144, 167, 172, 176–7
- ‘data controller’ 120, 136, 181, 187, 189
- data exits (out of China) 17, 94, 120,
 149, 152, 182
- data localisation 3, 74, 114
 AI 243, 256, 261, 282, 296, 299,
 301–6, 330
- background 130
- cost 144–8
- Cyber Security Law, under 17, 72,
 94–6, 287, 336
- definition of 102–5, 116, 123, 133,
 301
- expansion 197–8
- privacy 166
- protectionism 138–41
- rationale 131–7, 147
- technical viability 141–4
- data privacy 155, 159–60, 172, 175,
 204–5, 210
- definition of 154, 165, 196, 208
- data protection 94, 120, 132, 135, 140,
 142, 145, 154–6, 180, 192
- definition of 154, 159, 165, 196, 207
- demand for 175, 205
- privacy laws, and 185
- Data Security Law 157, 170, 195
- data theft 104, 134, 144, 155, 167,
 169–70, 172, 175, 185, 208
- Deep Learning 213, 216, 220–1, 226–7,
 251, 264, 285
- definition of 217–18
- DeepMind 222, 276. *See also* AlphaGo
- Def Con 273–4
- Development Zones, Economic and
 Technological Development
 Zone 11, 27, 37, 237
- Didi Chuxing, company 160, 188, 275,
 285, 325
- eBay, company 44, 230
- encryption 86, 90–1, 107, 114,
 153, 180
- keys 87, 89, 94, 96, 103
- Encryption Law 157
- entrepreneurs 5, 8, 22, 25, 30–2, 150,
 212, 234, 259
- operating environment 32, 36, 43, 55,
 60, 339
- EU *See* European Union
- European Union 18, 151, 167
- Face++ *See* Megvii, company
- Facebook 66, 90, 174, 202, 205, 266,
 270, 278, 336
- Fang Binxing 69
- FBI *See* Federal Bureau of Investigation
- Federal Bureau of Investigation (FBI)
 89–90
- Federated Learning 336
- Fei-Fei Li 214
- firmware 101
- definition of 101
- Five-Year Plans 22, 32, 237–8
- Foreign Investment Law 50, 55–6, 59,
 71
- ‘forking’ 268
- fuzzy logic 18, 73, 108, 129, 147–8, 158,
 189, 330
- AI 32, 209, 211, 222, 256,
 305–6
- computer science, in 12–13, 189
- content control 77
- data privacy 196, 202
- data protection 200, 207
- future impact 338
- intentions 332
- legal structures 36, 39, 43, 59
- legislating 7, 38, 88, 95, 117, 152, 184,
 187, 191, 257, 261, 330
- meaning in this book 11–14

INDEX

405

- GDPR *See* General Data Protection Regulation (EU)
- Geely, company 172
- General Data Protection Regulation (GDPR) (EU) 135–6, 155, 187, 193, 195, 199, 205, 337
- ‘data controller’ 187
 - ‘purpose limitation’ 190
 - data classes 191
- GitHub 230, 267–71, 284, 294
- Google 44, 203, 265, 270, 277–8, 283, 289, 298
- Android 90, 271, 280
 - Brain 276, 299
 - censorship 76
 - DeepMind *See* DeepMind
 - Maps 323
 - TensorFlow *See* TensorFlow, Google’s open-source AI platform
 - Waymo *See* Waymo, Google’s self-driving car program
- GPS mapping 315, 322–6
- GPU *See* graphics processing unit
- graphics processing unit (GPU) 28, 218, 267, 282. *See also* semiconductors
- Great Firewall 69, 76
- ‘guiding funds’ 245, 247
- Guiding Opinions on Actively Promoting the ‘Internet Plus’ Action Plan 70–1, 239
- hacking 84, 86, 141, 155, 166, 273
- Hax, hardware incubator 267
- hierarchical temporal memory 220
- Hikvision, company 108, 254
- Hong Kong Stock Exchange 43, 59–60, 293
- Horizon Robotics, company 231, 246, 250, 309–10
- Huawei 108, 246, 254, 271, 287–8, 291, 341
- IBM, company 114, 139, 222, 265, 277, 298, 304
- ICT *See* information and communications technology
- iFlytek 247, 249–50, 293
- ‘important data’ 116, 123–4, 132, 136, 157–201, 302, 323
- definition of 95, 101–5, 118, 121–2, 141, 315, 332, 337
- Infervision, company 202
- information and communications technology (ICT) 64, 70, 73, 138, 154, 234, 239. *See also* cyber space
- industry 6, 76, 130, 145, 147, 150
 - service providers 5, 73, 124
- Information Technology and Innovation Foundation (ITIF) 139, 142
- Informatisation 63, 66, 77, 81, 102, 111, 201, 212, 242
- meaning of 64–5
- initial public offering (IPO) 44, 49, 54, 60, 339
- innovation 75, 104, 139, 149, 153, 232
- defining 7–8, 21–35
 - government policies, Chinese 64, 70, 78, 81, 233, 237–8, 329
 - open-source 248, 264, 277, 281, 285
- Intel, company 114, 290, 317
- Intellifusion, company 231
- International Strategy of Cooperation on Cyberspace 75
- Internet Engineering Task Force (IETF) 146
- Internet of Things (IoT) 2, 4, 63–4, 83, 100, 153, 164, 228, 235, 283
- Internet Plus 63, 70–2, 75, 81, 153, 237, 330
- meaning of 4–5, 63–5
- Internet White Paper (2010), China’s 4, 49, 62
- IoT *See* Internet of Things
- IPO *See* initial public offering
- JD.com, company 48, 54–5, 160, 254, 271, 297, 312
- Jinri Toutiao, company 31, 178
- Kuang-Chi, company 228

- leapfrogging 27–8
 Lee Sedol, World Champion Go player 222
 ‘legitimate legal rights and interests’ 187
 Li Keqiang 4, 62
 Li Shufu 172
 Li, Robin 202, 205, 314
 LinkedIn, company 151, 278
 Linux Foundation 267, 271–2
 Lu Wei 49
 Ma, Jack 47–8, 76, 225, 339
 Ma, Pony 173, 225
 Machine Learning 33, 203, 213, 220, 224, 240, 251, 263–4, 266, 273, 277, 279, 282
 definition of 16, 215–17
 Made in China 2025 233, 306
 Malong Technologies, company 209, 229–30
 Mass Entrepreneurship 8, 30, 234
 Measures for Cyber Security Review, Interim *See* Security Review Measures, Draft/Interim
 Megvii, company 58–60, 231, 254, 341
 Meituan, food delivery service 179, 312
 Microsoft
 company 108–9, 111, 114, 203, 265, 268, 279, 288–9, 298, 317
 Machine Learning 266
 Open Platform for AI 267
 Ventures 230
 Windows 84, 111
 Ministry of Industry and Information Technology (MIIT), China’s 162, 178, 188, 228, 238, 269, 271, 296
 Ministry of Science and Technology (MOST), China’s 247–8, 257, 293
 Momenta, company 231, 309, 317
 multi-level protection system 105
 Nasdaq 37, 41, 46, 58
 Naspers, company 44–5
 National Cyberspace Security Strategy 82
 National Development and Reform Commission (NDRC) 235
 natural language processing 12, 216
 network effects 275
 ‘network operator’ 73, 105, 116–17, 136, 159, 164
 definition of 95, 100–2, 122–3
 privacy provisions 180, 183, 199
 Network Sovereignty 1, 8, 14, 16, 50, 57, 63, 66, 70, 78, 87, 115, 133, 242, 256, 297, 305, 320, 322, 327–8, 333. *See also* cyber sovereignty
 definition of 5–7, 72–7
 neural networks 203, 216–17, 220, 223, 285
 definition of 218
 Ng, Andrew 218
 NOBUS 90
 North Korea 84
 Nvidia, company 28, 230, 246, 309, 317, 337
 Obama, Barack 241
 OpenAI, company 224, 279–80
 open-source
 AI platforms
 benefits of 275–86
 case studies of 306–26
 definition of 263
 definition of 265
 history in China 265–75
 Open-Source White Paper 296–7
 Outbound Data Measures
 101, 116, 121
 second version 117
 third version 119–24, 197
 Outline of the National Informatisation Development Strategy 81–3
 PaddlePaddle, Baidu’s open-source Machine Learning platform 272–3, 287
 Personal Information Protection Law 121, 124, 156–94
 pilot petri dishes 8, 209, 221, 226, 258
 Pinduoduo, company 55, 78
 Pony.ai, company 307–9, 325

INDEX

407

- Privacy Standards (2020) 177–8, 185–6, 204
 about 181–5
 intention of drafters 187
 scope and application 187–90
- proprietary data theft *See* data theft
- ‘protected personal information’ 185–6.
See also Privacy Standards (2020)
- protectionism 106, 132, 141, 147, 149, 327, 333
- public-private partnerships 188, 243, 293, 316
 definition of 247, 251
- Qihoo 360, company 254
- QQ, instant-messaging service 170, 172, 214
- ransomware attack 84
- ‘rea-name registration’ or ‘real-name user registration’ 136, 154, 156, 201, 207
 meaning of 161–4
- Reinforcement Learning 217, 220
- Roadstar.ai, company 308–9
- Schumpeterian innovation 22
- ‘secure and controllable’ 73, 76, 82, 109, 112–14, 242, 257, 329
 definition of 85
- Securities Regulatory Commission (SRC), China’s 53–4, 60
- Security Review Measures, Draft/ Interim 101, 103, 112, 115
- Sedol, Lee, World Champion Go player 222
- self-driving cars 27, 33, 83, 151, 306, 311, 316, 321, 324. *See also* autonomous vehicles
- self-learning systems *See* Deep Learning; Machine Learning
- semiconductors 28, 34, 212, 245, 298.
See also graphics processing unit (GPU)
- SenseParrots, SenseTime’s open-source AI platform 295, 299
- SenseTime, company 58, 231, 247, 249–50, 252, 291, 298
 ‘sensitive personal information’
 definition of 186, 189, 196
- Sesame Credit, Alibaba’s social credit product 178
- Shanghai Stock Exchange Star Market (Science and Technology Innovation Board) 58–60
- shanzhai* 23, 267
- ‘sharding’ of data 142, 144
 definition of 143
- Shenzhen Stock Exchange 52, 249, 293
- Siemens, company 28, 111, 283
- Sina, company 41–2, 46–8, 51, 163, 176, 310
- Sinovation Ventures, venture capital firm 230
- Smart Cities 4, 63, 74, 100, 254–5, 259, 321
 AI, and 212–13, 236–8, 242–3
 Alibaba, and 293–4
 defined terms under Cyber Security Law, and 100
 meaning of 236
- Snowden, Edward 16, 89, 130
- Social Credit System 155, 178, 242
- SOE *See* state-owned enterprise
- Softbank 44, 48
- Standardisation Administration of China 181, 188
- Standing Committee of the National People’s Congress 96–7, 121, 170, 194
- start-ups 22
 AI 35, 212, 220, 230, 247, 250, 295, 306, 312
 Chinese 25, 267, 284, 327
 government policies, Chinese 30, 71, 77, 124, 202
 offshore investment 50, 55
- State Council 4, 50, 70, 87, 102, 105, 238
- State Internet Information Office (SIIO), China’s 66, 162
- state-owned enterprise (SOE) 9, 38, 44, 63, 101, 206, 228–9, 250, 256, 269, 316, 339

- strong internet country 4, 63
Supervised Learning 216
surveillance 58, 69, 108, 130, 197, 207, 232, 252, 291, 341
Surveying and Mapping Law 323
symbiotic relationship between the public and private sectors 8, 30, 35, 212, 231, 249, 258
synthetic data 302
- TC260 *See* China National Information Security Standards Technical Committee
techno-utilitarian 202
Tencent, company 44, 52, 69, 77, 161, 170, 173, 214, 227, 249, 269, 272–3, 289, 294
TensorFlow, Google’s open-source AI platform 266, 272–3, 276, 282, 284, 287, 299, 336
TikTok 31, 55, 196
top-down government signalling 33, 209, 245
Trump, Donald 123, 254, 288
trust scandals 159, 166
TuSimple, company 308–11
- Uber, company 151, 285, 311
Uisee, company 311
United States 16, 28, 42, 48, 52, 55, 80, 89, 137, 225, 241, 268, 278, 288, 308
Unsupervised Learning 216
- variable-interest entity (VIE) 40, 45, 50, 53, 55–6, 71, 307, 333
activist investors, and 50
emergence 42
legal status 43, 56, 59
risks 52
structure 40–2
VIE *See* variable-interest entity
virtual private network (VPN) 72, 268
VPN *See* virtual private network
- Wan Gang 225, 246, 251, 292
Waymo, Google’s self-driving car program 224, 314
WeChat Pay, product 204
WeChat, app 45, 100, 144, 162, 165, 172–4, 190, 196, 204–5, 207
Weibo, company 42, 46, 163
WeRide.ai, company (formerly JingChi) 308, 310
wholly foreign-owned enterprise (WFOE) 40–1, 44, 322
World Economic Forum 18, 71
- Xi Jinping 1, 5, 51, 62, 65, 71–2, 238
Xiaomi, company 26, 54, 254
Xinjiang 15, 58, 335, 341
- Y Combinator, incubator 279
Yahoo, company 41, 44, 47–8
Yitu Tech, company 35, 231, 254, 278, 290
- ZTE, company 272, 341