

Index

- action imitation, 174
active learning, xvii, 54, 77, 78, 103
adaptiveness, xvii, 78
agent–environment interaction, 56
area-restricted search, 237
artificial agent, 53, 206
artificial curiosity, 129
attention control, 68, 217, 218, 219, 221, 224, 225, 228, 233
autoencoder network, 62
autonomous agent, 70
autonomous learning, xvii, 64
- Bayesian decision theory, xviii, 125, 126, 128, 131, 132, 135, 137
Bayesian inference, 17, 18
belief inference, 172, 181
belief polarization, xvi, 17
belief updating, 20
belief-based utility, 6, 15
belief-formation, 7
biological agent, xvii, 54
brain network, 206, 268, 269
- categorization task, 107
classification task, 104, 112, 115, 158
conceptual task, 152
conditional entropy, 125, 129, 160
curiosity, xv, xvi, 4, 6, 31, 34, 37, 53, 54, 68, 77, 158, 205, 241, 259, 260, 261, 264, 265, 268
curiosity-driven exploration, 55, 56, 67, 69
curiosity-driven learning, 53, 68
curiosity-driven systems, 64, 69, 70
- directed exploration, 46, 60, 61, 148, 149, 156, 208
dopaminergic neurons, 198
- ecological learning, 82
edgework account of curiosity, 260
empowerment-based exploration, xviii, 159
entropy measures, 103, 109, 115
entropy reduction, 106
episodic memory, 245
- error entropy, 107, 108
error learning, 238
executive network, 221, 222
expected entropy, 106
expected free energy, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133
expected free energy minimization, 125
expected information gain, 129, 130, 133, 135, 225, 280
expected value, 129, 151, 172, 198, 229
experimental task, 37
exploration strategies, 63, 83, 147, 149, 153, 157, 161, 162
exploration–exploitation dilemma, 147, 148, 149, 279, 282
external search, 244
external space, xviii, 239
- feature attention, 219
foraging mechanisms, 241, 244
foraging strategies, 239, 240, 243
foraging task, 135, 153
free association task, 244
- gambling task, 245
goal achievement, 58, 63
goal emulation, 177, 182
goal exploration, 61
goal representation, 58, 60
goal space, 57, 58, 60, 64
goal-conditioned exploration, 149, 162
- Hartley entropy, 108, 109, 111
hedonic value, xvi, 44
heuristics, xvii, 102, 114, 148, 149, 156, 282, 283, 284
hidden mental states, 180, 184, 283
human inquiry, 115, 269
- individual learning, 70, 172, 174, 175, 179, 285
inferential value, 6
information search, 41, 78, 82, 102, 152, 163, 252, 282, 283
information value, 104, 106, 200

- instrumental value, 5, 172, 175, 178, 179, 184, 202, 279
 internal search, xviii, 238, 241, 244
 internal space, 238
 intrinsic motivation, xvii, 54, 55, 59, 64, 65, 67, 68, 69, 206, 260, 280
 intrinsic reward, 11, 57, 63, 162, 172, 179
 intrinsically motivated agent, 63
 knowledge network, 40, 262, 263, 265, 266, 269
 lateral fronto-parietal network, 222
 learning algorithms, 53, 54
 long-term memory, 240, 246, 249
 machine learning, 13, 53, 109
 marginal entropy, 160
 Markov decision process, 126
 memory search, 244, 247, 248, 249, 250, 252
 mental-state inference, 170
 model-free learning, 63
 motivated learning, 58, 67
 multi-armed bandit task, 147, 148, 149, 151
 network edges, 268
 network neuroscience, 267
 network nodes, 267
 network science, 260, 261, 265
 neural network, xviii, 62, 206, 252
 observational learning, 171, 175
 one-time information-seeking, xvii, 31, 32, 33, 34, 36, 38, 43
 open-ended inquiry, 117
 optimal Bayesian design, 125, 126, 128, 130, 132, 133, 135, 137, 139
 optimal search, 83
 parietal neurons, 208
 perceptual task, 103
 policy imitation, 172, 174, 182, 185
 posterior belief, 125, 132, 224
 posterior entropy, 106, 132
 prefrontal-mesolimbic network, 198
 prior belief, 18, 81, 129, 130, 131, 135, 223, 225
 prior entropy, 106, 158
 prior uncertainty, 225, 227, 228, 233
 probabilistic models, xvii
 probability gain, 108
 quadratic entropy, 109
 query outcomes, 106
 query selection, 102, 108, 112, 114, 115
 random exploration, 65, 82, 148, 150, 151, 153, 155, 157, 161, 208
 rational agent, 5, 14, 17, 282
 reinforcement learning, 13, 54, 117, 129, 132, 147, 156, 157, 160, 161, 163, 176
 representational exchange framework of social learning, 180
 restless bandit task, 151
 reward information, 207
 reward learning, 44
 reward value, 35, 39, 43, 45, 46, 82, 198, 206, 245
 reward-learning models, 32, 34, 35, 38, 39, 43
 reward-seeking, xix, 207, 279
 RL agent, 65
 saccade task, 229
 sample learning, 55, 59
 search behavior, xviii, 114, 152, 241, 242, 246, 247, 248, 252
 search network, 252
 search strategies, 243, 245, 246, 247, 248
 selective attention, 78, 218, 222, 229, 233
 self-generated goal, 59, 61
 semantic memory, 239, 240, 241, 242, 243, 244, 246, 247, 248, 249, 251, 252
 semantic network, 243, 248, 251
 semantic search, 243, 244, 245, 246
 sense-making process, 5, 14
 Shannon entropy, 106, 107, 109, 112, 225
 shared and independent network, 197
 Sharma-Mittal space of entropies, 109
 social inference, 170, 179
 social learning, xviii, 169, 170, 171, 172, 174, 175, 177, 179, 180, 181, 182, 183, 185, 186, 283
 spatial attention, 222
 spatial foraging, xviii
 spatial search, 82, 87, 239
 spatial search task, 82, 87
 spatial task, 152
 task engagement, 32
 task environment, 87, 112
 trait curiosity, 44
 uncertainty reduction, 106, 195, 202, 206, 207, 208
 uncertainty-driven curiosity, 208
 uncertainty-guided exploration, 163
 unobservable mental states, 170, 172
 value inference, 172, 176, 182
 variational free energy, 126, 127
 verbal fluency task, 245, 250