Index

absolute fairness, see fairness
additive noise, 19, 22, 84
additive white Gaussian noise, 113, 121, 197
agent selection, see peer-to-peer streaming with group peers
attacks
  averaging-based, 19
  collusion, 15, 16, 18, 19
  framing, 280, 298
optimal attack strategies against incentive mechanism
  for peer-to-peer streaming over Internet, 256
  for peer-to-peer streaming over wireless, 266
axiom, 50
backward induction, 47, 200, 214
bandwidth, 5, 171, 227, 249, 308
bargaining
  axiomatic bargaining model, 50
  bargaining power, 42, 51, 52, 154
  independence of irrelevant alternatives, 50
  invariance to equivalent utility representations, 51
  Nash bargaining, 42, 51
  Pareto efficiency, 50
  strategic bargaining model, 51
  symmetry, 50
behavior strategy, 172
buffer
  buffer map, 25, 171, 176
channels
  fading, 178, 197
  cheat, 185, 186, 247
  cheat-proof, 175, 185, 188, 189
  chunk reply algorithm, 268
  chunk request algorithm, 189
  with scalable coding
    optimal, 193
  video quality metrics, 190
colluder
  cheating colluder, see also traitors within traitors
colluder-detector dynamics
  min–max formulation, 94
min–max solution, 102
Stackelberg game modeling, 94
dynamics, 133, 278
framing colluder, 299
colluders
  colluder-detector dynamics
  equilibrium analysis, 94
  honest colluder, 278
collusion
  fairness
    absolute fairness, 153, 174–176
    collective fairness equilibrium, 92
    equal-risk, see also equal-risk collusion
    impact of side information on, 92
    max–min fairness, 154
    max–sum fairness, 154
    Nash bargaining solution, 154
game-theoretic modeling
  feasible set, 98, 137, 159
  game model, 93, 133
  Pareto optimality, 138
  reward function, 136
  time-sensitive bargaining model, 154
  utility function, 93, 133
  when to collude, 139
intercopy collusion, 113, 222
intergroup collusion, 21
intracopy collusion, 21, 112
intragroup collusion, 21
maximum-payoff collusion, 160
nonlinear collusion, 16, 84
risk–distortion model, 113
video collusion attack, see video collusion attack
collusion resistance
  performance criteria, 23
scenarios
  catch-all, 80
catch-more, 79
  catch-one, 75
  constrained concave–convex procedure (CCCP), 116
  convex hull, 173
correlation-based detection, 16
distribution of detection statistics, 223, 231
traitor-tracing capacity, 75
cost, 35, 127, 172, 200, 249, 262, 311, 319
credit, see cooperation stimulation
data hiding, see spread spectrum embedding
DCT-domain visual model, 19
delay, 13, 197, 252
density of a graph, 7
detection
blind, 22
correlation-based, 223
detection statistics, 23, 113, 134, 223, 231
digital fingerprinting, see traitor tracing
domination, 43
strictly dominated strategy, 43
enforceable payoff profile, 173, 181
equal-risk collusion, 58, 93, 99
constraints, 61, 62
parameter selection, 61, 62
equilibrium
improvement, 49
mixed-strategy, 44, 207
Nash, 43, 152, 173
pure-strategy equilibrium, 43
stable equilibrium, 212, 308
evolutionarily stable strategy, 212, 308
extracted fingerprint, 23, 58, 86
false alarm probability, 114, 297
feasible set, 98, 137, 201
fingerprint detector
collective detector, 87, 91
fingerprint detector at each individual layer, 87
optimum detector, 91
self-probing detector, 91, 94
fingerprinting
collision-resistant fingerprinting, 17
orthogonal fingerprinting, 16
scalable video fingerprinting, 18
Folk theorem, 49, 173
free riding, 261, 308
game
bargaining game, see bargaining
evolutionary, 48
matrix form, 44
noncooperative game theory, 43
player, 42
repeated, 49
Stackelberg game, 94, 199
strategy of player, 42
subgame, 46
utility, 42
game tree, 47, 94
Gaussian distribution, 103, 223, 233, 311
Gaussian fingerprinting, 111
ground distance, 7
graph, 6
host signal, 15, 19, 21, 72, 86, 278
human visual model (HVM), 19, 296
incomplete information, 181
infinite repeated game, 173, 184
information set, 46
just-noticeable-difference (JND), 16, 19
max-min, 153, 156
media-sharing social network
network structure, 9
mesh-pull peer-to-peer video streaming
incentive mechanism, see incentive mechanism
mesh formation
streaming engine, 26
track server, 25
video server, 26
over Internet, 170, 325
over wireless, see wireless streaming model
peer selection, 26, 34
security threats, 32
min-max strategy, see also collusion
miss-detection probability, 294, 298
mixed strategy, 44, 212
mobile video streaming
redistribution game, see video stream
redistribution game
system model, 196
MPEG, 14, 177
MSE, 223, 289
Nash bargaining
generalized Nash bargaining solution, 53
Nash product, 51
solution, 51, 154
Nash bargaining, 50
Nash equilibrium, see equilibrium
network structure
centralized, 280
distributed, 305
hybrid, 308
nework structure
centralized, 7
distributed, 308
hierarchical, 10
nodal degree, 7, 9
noncooperative games, see games
normalization, 137
objective function, 115, 174
optimal strategy
colluders’, 110
content owner, 210
detector’s, 110
peers’, 172, 175, 255
secondary buyers’, 200, 207
subscribers’, 202
orthogonal fingerprinting, 16

Pareto optimality, see also equilibrium
payoff, 41, 44, 93, 169, 199
peer agent, 309, 311
group peer, 308, 309
malicious attackers, 249, 256
rational (selfish) users, 249
super node, 30, 38
peer churn, 25, 27, 30
peer-to-peer video streaming
live streaming, 28
mesh-pull, see mesh-pull peer-to-peer video streaming
tree-push, 24
video-on-demand, 28
peer-to-peer streaming with group peers
agent selection
centralized, 312
distributed, 312
within a heterogeneous group, 317
within a homogeneous group, 311
distributed learning, 320
system model, 309
perceptual quality, 16, 19, 223
perfect information, 47, 200
playback time, 25, 28, 182, 183, 253
pricing game
evolutionary dynamics, 211
game model, 210
optimal pricing strategy, 215
prisoner's dilemma, 43, 44, 48
PSNR, 197, 259, 272, 304
quadratically constrained quadratic program (QCQP), 116
rate distortion, 196, 198
reward, 131, 133, 136, 199, 263
risk, 57, 58, 110, 116, 223, 264
risk-distortion model, see also video fingerprinting
scalable video coding, 17
temporal scalability, 18
secondary buyer, 196–200
semantics, 5
emergent semantics, 11, 12
semantic diversity, 12
side information
social media annotation, 11
labeling, 11
tagging, 11
social network
affiliation networks, 10
affiliation matrix, 10
bipartite graph, 10
representation, 6
sociogram, 6
sociomatrix, 6
social network analysis
centrality, 7
cohesive subgroup, 9
dynamic network analysis, 10
prestige, 7
statistical network analysis, 10
structural equivalence, 9
spread spectrum embedding, 281, 287, 296
subscriber, 199, 200, 202
subscribers, 195, 196
traitor tracing, 14, 15
traitor tracing capability, see also collusion
resistance
traitors within traitors
cheating colluder detection and identification assistant, 290
autonomous, 289
resistance to framing attacks, 304
with trusted ringleader, 280
in scalable video fingerprinting, 235
temporal filtering
risk minimization, 223
tradeoff, 225
trust, 12, 49, 199, 264, 278
utility, 133, 171, 180, 199, 200, 250
video chunk, 25, 26, 249
video collusion attack, see also collusion, 113
video fingerprinting
risk-distortion model
absolute risk-distortion curve, 123
optimal strategy with side information, 117
relative risk-distortion curve, 123
scalable video fingerprinting, 18
video stream redistribution game
equilibrium analysis, 200
game definition, 199
optimal strategy, 200, 202
video streaming
mesh-pull peer-to-peer, 24, 170
mobile video streaming, 196
wireless channel, see channel
wireless streaming, 178