

Index

A

Asynchronous fusion estimation, 46, 52, 147–158
Average dwell time, 76, 81, 82

B

Bandwidth constraint, v, vi, 2, 5, 99, 103, 107, 122, 125–127, 132, 135, 137, 138, 142, 143
Bernoulli sequence, 11, 49, 71

C

Clustered sensor network, 154, 156
Computational complexity, 178, 179, 198
Covariance intersection fusion, 5, 147
Covariance matrix, 20, 22, 26, 29–31, 51–53, 100, 101, 107, 109, 112–115, 126, 129–131, 151, 152, 157, 158, 164, 166, 176, 178, 189, 195, 197, 199–203
Cross-covariance, 5, 29–31, 33, 45, 47, 51–53, 55, 57, 59, 61, 67, 147–148, 166, 176, 178, 189

D

Delay, v, vi, 3, 4, 6, 16, 161–185, 187–206
Dimension reduction, vi, 1–2, 99–133
Disagreement potential, 28, 36, 37, 41
Distributed estimation, 3, 12, 13, 19–37, 162
Disturbance attenuation level, 139, 142–144

E

Energy constraint, v, vi, 1, 5, 14, 45, 102, 103, 106, 107, 109, 114, 115, 119, 123, 127–133
Energy-efficient, v, vi, 1, 2, 11, 43, 45, 73, 99
Energy saving rate (ESR), 105, 122–124, 127–130, 132
Exponential stability, 87, 94

F

Finite horizon estimator, 106–115, 133, 191–198, 205, 206
Fusion accuracy, 156
Fusion estimator, vi, 4, 5, 29, 30, 39, 45–48, 50–68, 71, 72, 99, 106–124, 125, 128, 130–133, 135, 137, 139–144, 146, 147, 158, 161, 162, 165, 176, 179, 180, 181, 183–185, 187, 191–206

H

Hadamard product, 110
 H_∞ filter, 5, 46, 75, 76, 79, 81, 83, 89–91, 94–96
Hierarchical fusion, 5, 12, 147, 148, 154, 158

I

Innovation sequence, 22, 161, 165, 172

K

Kalman filter (KF), 5, 6, 21, 64, 66, 75, 79, 100, 161, 165, 187, 188

L

Linear combination, 34, 106
 Local estimator, vi, 2–5, 11–12, 14, 16, 18, 28, 29, 36–39, 41–43, 45–48, 50–53, 55, 59–61, 64, 66–72, 91, 93, 99, 101, 102, 104, 108, 113–116, 120, 124–127, 129, 135, 136, 147–158, 162, 171, 175, 184, 185, 187, 189–191, 194, 195, 197, 199–204, 206
 Logarithmic quantizer, 5, 135, 136, 144
 Lyapunov function, 65, 84

M

Mean square error (MSE), 6, 21, 99, 106, 115, 116, 119–121, 123, 124, 126–128, 131–133, 187, 191, 199, 202, 204, 206
 Multi-rate, v, 2, 4, 11–43, 48, 75
 Multi-sensor fusion, v, vi, 1, 3–6, 46, 124, 133, 135, 146, 147, 202, 206

O

Observation noise, 157
 Orthogonal matrix, 120
 Orthogonal projection principle, 12

P

Packet loss, v, vi, 1, 3–6, 11, 13, 14, 16, 18, 29, 37, 39, 42, 43, 46, 76, 78, 81, 83, 96, 149, 161, 164, 187–206
 Predictor, 22, 28

Q

Quantization level, 136

R

Robust estimator, 180

S

Sampled-data, 5, 46, 75–78, 83, 96
 Schur complement lemma, 67, 90, 139
 Schur stable matrix, 136
 State-transition matrix, 46, 47, 115, 199–200, 202
 Steady-state estimator, 64, 66, 67, 71, 121, 123, 126, 128, 131, 201–205
 Stochastic observability matrix, 198
 Switched system, 76–78, 93, 96

T

Track-to-track fusion, 45, 47, 59, 72
 Transfer function matrix, 138
 Transmission rate method, 2, 11, 18, 43

U

Unbiased estimate, 29, 99, 108, 109

W

Weighting matrix, 107, 109, 114, 115, 135, 138, 139, 141–144, 165, 191, 192
 White noise, 12, 37, 47, 49, 58, 64, 67–68, 70, 108, 119, 124, 148, 162, 164, 179, 180, 183, 188, 199, 200
 Wireless sensor network (WSN), v, 1, 3, 4, 11–14, 28, 29, 37, 38, 43, 45, 47, 102, 130, 147