
Index

- Chernov-Lesort circle fit, 92–94
Chernov-Ososkov circle fit, 107–109,
122, 184, 229, 230, 233
Contour map, 62, 63, 77, 87
Errors-in-variables (EIV) regression,
4–8, 10, 12, 13, 15, 18–23,
34, 42, 46, 147, 148, 163,
166, 167, 194
Escape valley, 62–67, 83, 87, 91, 92,
134
Essential bias, 159, 161, 163, 166,
174, 177, 181–183, 185,
187, 188, 190–192, 195–
197, 201, 205, 235
Fisher information matrix, 43, 175
Fixed point method, 89, 90
Gander-Golub-Strebel (GGS) circle
fit, 120, 121, 131, 216
Gauss-Newton method, 72, 74, 76, 77,
83, 84, 89, 95, 96, 101, 226
Geometric consistency, 154, 159, 162,
176
Gradient-weighted algebraic fit, 151–
153, 162, 214, 222
Heteroscedastic errors, 4, 15, 98
Hyperaccurate circle fit, 183–185,
189–191, 196, 199, 202,
204, 205, 235
Incidental parameters, 6, 33, 139
Initial guess, 60, 63, 67, 70, 80–82,
88–92, 99, 108, 113, 126, 132–134, 136, 150, 201,
203
Inversion-based circle fit, 217, 218,
220–224, 226–228, 233, 235
Kanatani-Cramer-Rao (KCR) lower
bound, 162, 163
Karimäki circle fit, 50, 52, 54, 228–
235
Kukush-Markovsky-van Huffel (KMvH)
consistent fit, 194, 195, 197–
201, 205
Kåsa circle fit, 101–109, 113–118,
120, 121, 126–128, 131,
133–135, 145, 149–151, 157,
177, 178, 187, 188, 190,
192, 196
Landau circle fit, 88–91, 96, 132, 133
Latent parameters, 6, 33, 34, 42, 139,
175
Levenberg-Marquardt method, xv, 74–
77, 79–81, 83, 84, 87, 89–
91, 93, 95, 96, 101, 118,
132, 133, 226
Maximum Likelihood Estimates (MLE),
xx, 2, 4, 9, 12, 13, 16–
19, 35, 141, 142, 144–153,
159–162, 166, 168, 193
Mean Squared Error (MSE), xx, 16–
18, 39, 146, 147, 155–158,
188, 190, 205, 235
Moore-Penrose pseudoinverse matrix,
xix, 19, 41, 73, 104, 179

- Nievergelt circle fit, 120, 121, 131, 216
Noise level, 18, 24, 37, 46, 61, 62, 81, 88, 90, 91, 94, 104, 119, 120, 133, 148, 159, 166, 168, 188, 196, 204, 234
Normal equations, 73, 75, 101, 114
Nuisance parameters, 6, 33, 143

Paraboloid circle fit, 121
Pratt circle fit, 70, 100, 108, 109, 111–114, 116–118, 120–122, 124, 126–128, 131–135, 149, 151, 177, 178, 182–185, 187, 188, 190–192, 196, 199, 204, 205, 217, 224, 227, 235

Renormalization scheme, 200–205
Riemann fit, 210, 212, 214–217, 222, 224, 227
Riemann sphere, 28, 208–210, 212
Rusu-Tico-Kuosmanen-Delp (RTKD)
iterative circle fit, 224–227, 235

Scatter matrix, 3, 4, 8, 9, 31, 33, 65, 198, 211, 214, 223
Scattering ellipse, 9, 31, 66, 67
Späth circle fit, 84–86, 88, 90, 91, 96, 97, 132, 133
Stereographic projection, 208, 209, 238
Sylvester’s law of inertia, 110, 204

Taubin circle fit, 70, 100, 121, 123–127, 129, 131–135, 149, 151, 177, 178, 182, 183, 187, 190–192, 196, 199, 205, 235
Trust region method, 76–78
Two Valley Theorem, 62–64, 67