

Matlab results: example 1

100 input-output samples.

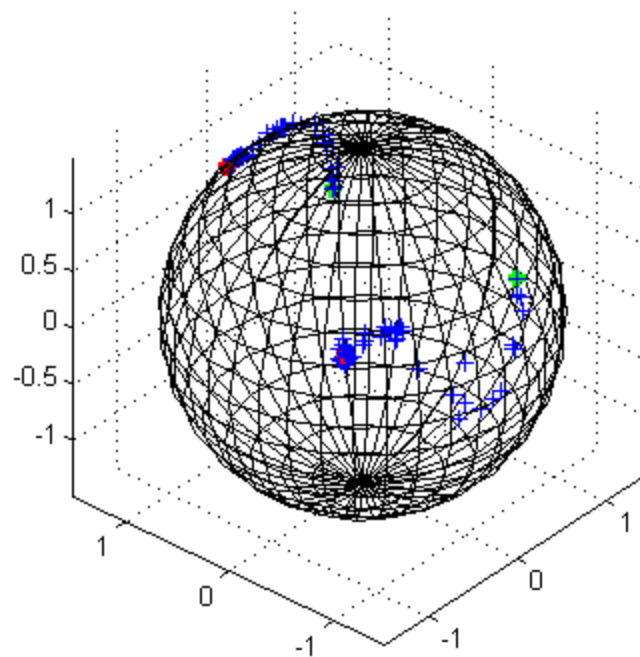
Random input (thrust with $\mu = 5\text{Newton}$ and $\sigma = 1\text{Newton}$, angle uniform $\in [-\pi, \pi]$)

Added gaussian noise with $\mu = 0$ and $\sigma = 0.002$ as gyro noise (50 Hz).

Arbitrary initial guess.

	theta true:	theta init:	theta optim:	abs error
rod 1_1:	1.732051	1.389267	1.732122	0.000071
rod 1_2:	0.000000	-0.055294	-0.003793	0.003793
rod 1_3:	0.000000	-0.806285	-0.020069	0.020069
rod 2_1:	-0.866025	-1.916043	-0.867871	0.001846
rod 2_2:	1.224745	0.731097	1.213014	0.011731
rod 2_3:	0.000000	0.631515	-0.002615	0.002615
	pos true:	pos init:	pos optim:	norm error:
pos_1_x:	0.000000	0.984122	0.028911	0.028912
pos_1_y:	1.299038	1.125819	1.298819	
pos_1_z:	0.750000	0.118479	0.749822	
pos_2_x:	-1.130534	0.256353	-1.130633	0.008862
pos_2_y:	-0.799408	-1.272759	-0.804468	
pos_2_z:	0.576923	0.751244	0.569649	

2 motors, rod parameters, radius is known



Iteration: 264
fval: 0.062228
Alg: contract outside

Green: Initial points

Blue: Iteration and optimized points

Red: True points

Matlab results: example 2

100 input-output samples.

Random input (thrust with $\mu = 5\text{Newton}$ and $\sigma = 1\text{Newton}$, angle uniform $\in [-\pi, \pi]$)

Added gaussian noise with $\mu = 0$ and $\sigma = 0.002$ as gyro noise (50 Hz).

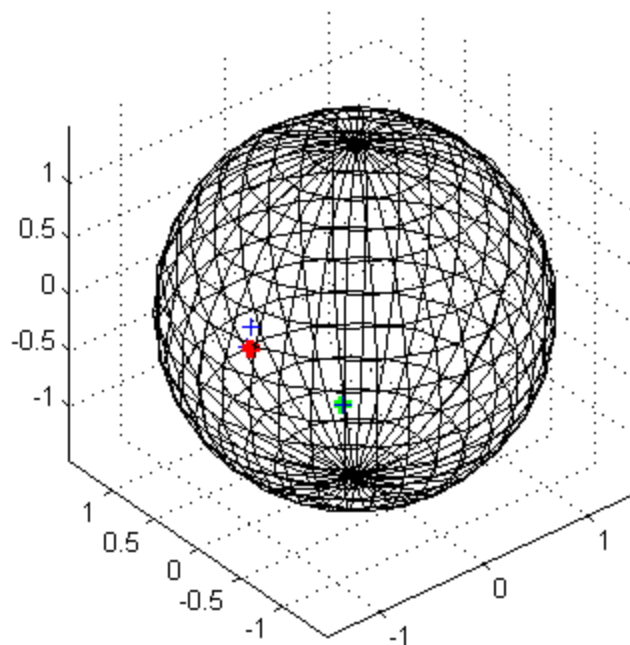
Arbitrary initial guess.

	theta true:	theta init:	theta optim:	abs error
quat 1_1:	0.122395	0.130971	0.148879	0.026484
quat 1_2:	0.698882	0.362740	0.787801	0.088919
quat 1_3:	0.408393	0.545282	0.453791	0.045398
quat 1_4:	0.574281	0.744268	0.641491	0.067210
radius:	1.500000	1.051434	1.195608	0.304392

Note: Quaternion is not unit scaled (unconstraint optimization)

	pos true:	pos init:	pos optim:	norm error:
pos_1_x:	-1.354019	-0.717901	-1.369994	0.035418
pos_1_y:	-0.446978	-0.753515	-0.415630	
pos_1_z:	0.465664	-0.149488	0.469733	

1 motors, quat parameters, radius is estimated



Iteration: 8
Resnorm: 5.610091
Alg: Levenberg-Marquart

Green: Initial points

Blue: Iteration and optimized points

Red: True points