Error estimation via pole classification

Mathematics:

Define y as filter output, x as prediction step output:

$$y = x + K * (z - x) = x + Kz - Kx = x(K - 1) + Kz$$

$$y_i - x(K - 1) = Kz$$

Define

X= t * y_{i-1}

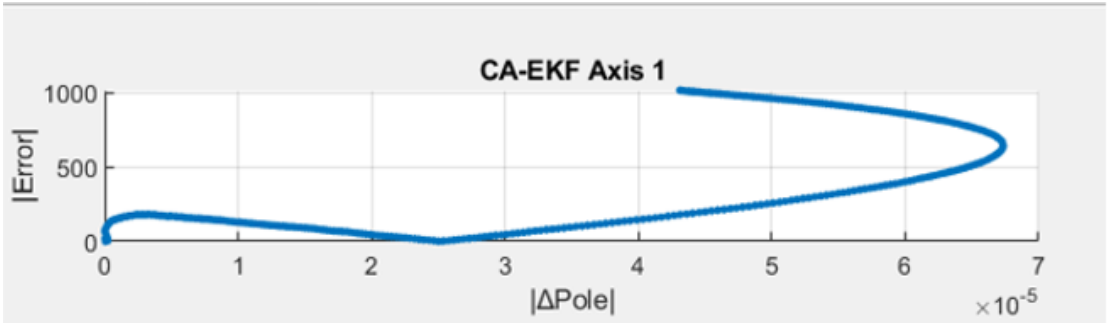
$$y_i - t * y_{i-1}(K - 1) = Kz$$

Perform z transform:

$$\frac{Y(z)}{Z(z)} = \frac{K}{(1 - t * z^{-1} * (k - 1))}$$

$$Pole = t * (k - 1)$$

Graph output:



Classifiers results (after cross validation):

Threshold	Decision Tree	Random Forest	Logistic Reg	SVM (RBF)	KNN
5	0.631711	0.631467	0.631956	0.631956	0.559211
8	0.841789	0.841789	0.841789	0.841789	0.815889
10	0.917689	0.917689	0.917689	0.917689	0.911900
12	0.959767	0.959767	0.959767	0.959767	0.958589
15	0.987311	0.987311	0.987311	0.987311	0.987256

- 5 meters error estimation has 63 % classification accuracy.
- 8 meters error estimation has 84 % classification accuracy.
- 10 meters error estimation has 91 % classification accuracy.