

Error study

1. Consider the polar equation of the line in (r, θ) format.
2. Generate the set of points (x_i, y_i) $i = 1, 2, \dots, N$ in the range $(X_{\min}$ to $X_{\max})$
3. Generate $2N$ random numbers in the range $(0, M)$
4. Add the random numbers to the points as obtained in step 2
5. Feed this new set of perturbed point set to your Least Square Fit routine to get the new value for (r', θ')
6. Calculate Error estimate $E_s = \sqrt{sqr\left(\frac{r - r'}{r}\right) + sqr\left(\frac{\theta - \theta'}{\theta}\right)}$
7. Plot E_s vs M where M varies between 0 and $X_{\max}/5$