

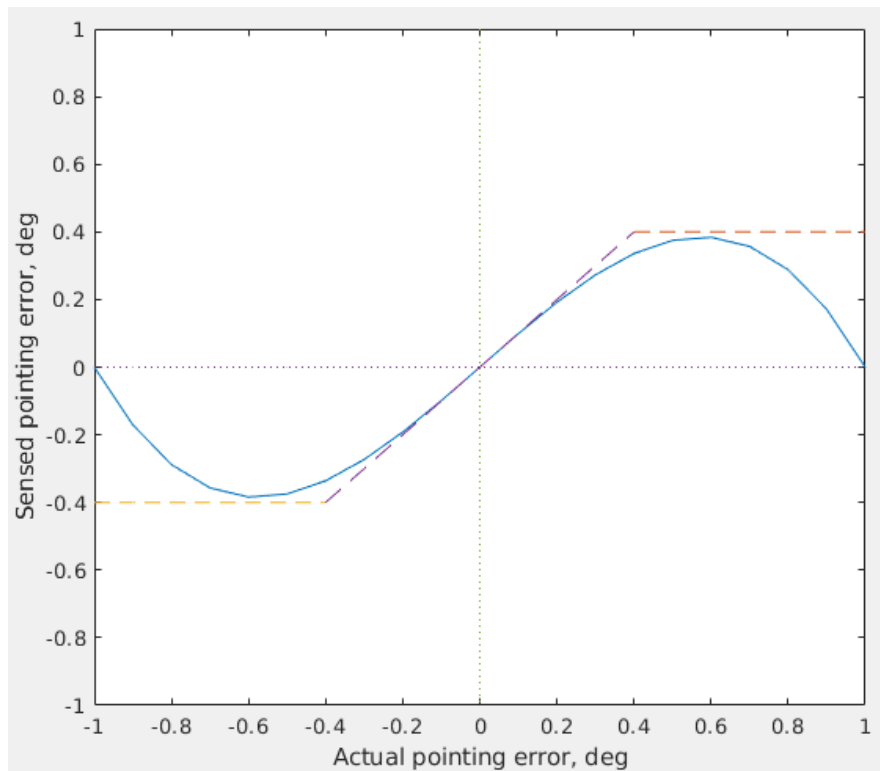
EE 6383 Nonlinear Control Systems

HW 4 – RIDF Analysis

Asst. date: 31 May 2019 – Due date: 7 June 2019

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We are going to **duplicate** the antenna pointing and tracking problem, slides 9 – 16 **except** we will use a more realistic antenna characteristic. The behaviour of the third-order polynomial in the “Volterra paper” is strange for $|e| > 0.6$; the limiter makes more sense, as you can see.



1. The model and corresponding MATLAB function are similar to (almost the same as) given on slides 9 and 14. But please, copy them thoughtfully, to be sure you understand it. The describing function terms, given on slide 20, should be implemented using the MATLAB `erf` function.
2. Now, perform an RIDF performance study for the same initial condition statistics and noise intensity specified.
3. Compare your results with those for the third-order polynomial depicted on slide 16. How different are they? Why? What happened (i.e., did it still lose track)? Try to factor in your physical understanding of the system and problem.