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3-D Visualization and Optimization for SISO Linear Systems Using Parametrization of Two-Stage Compensator Design

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Abstract : In this paper, we consider the two-stage compensator designs of SISO plants. As an investigation of the characteristics of the two-stage compensator designs, which is not well investigated yet, of SISO plants, we implement three dimensional visualization systems of output signals and optimization system for SISO plants by the parametrization of stabilizing controllers based on the two-stage compensator design. The system runs on Mathematica by using “Three Dimensional Surface Plots,” so that the visualization can be interactively manipulated by users. In this paper, we use the discrete-time LTI system model. Even so, our approach is the factorization approach, so that the result can be applied to many linear models.

Keywords : linear systems, visualization, optimization, Mathematica
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