Number of Parametrization of Discrete-Time Systems without Unit-Delay Element: Single-Input Single-Output Case

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Abstract : In this paper, we consider the parametrization of the discrete-time systems without the unit-delay element within the framework of the factorization approach. In the parametrization, we investigate the number of required parameters. We consider single-input single-output systems in this paper. By the investigation, we find, on the discrete-time systems without the unit-delay element, three cases that are (1) there exist plants which require only one parameter and (2) two parameters, and (3) the number of parameters is at most three.

Keywords : factorization approach, discrete-time system, parameterization of stabilizing controllers, system without unit-delay