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A METHOD FOR COMPUTING QUADRATIC BRUNOVSKY FORMS*

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Abstract. In this paper, for continuous, linearly-controllable quadratic control systems with a single input, an explicit, constructive method is proposed for studying their Brunovsky forms, initially studied in [W. Kang and A. J. Krener, Extended quadratic controller normal form and dynamic state feedback linearization of nonlinear systems. *SIAM Journal on Control and Optimization*, 30:1319-1337, 1992]. In this approach, the computation of Brunovsky forms and transformation matrices and the proof of their existence and uniqueness are carried out simultaneously. In addition, it is shown that quadratic transformations in the aforementioned paper can be simplified to prevent multiplicity in Brunovsky forms. This method is extended for studying discrete quadratic systems. Finally, computation algorithms for both continuous and discrete systems are summarized, and examples demonstrated.

Key words. Continuous quadratic systems, Discrete quadratic systems, Linearly-controllable control systems, Quadratic transformations, Quadratically state feedback equivalence, Quadratic Brunovsky forms.

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