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Using Laguerre functions to improve the tuning and performance of predictive functional control

(📄 Article in press ?)

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Abstract

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This paper proposes a novel modification to the predictive functional control (PFC) algorithm to facilitate significant improvements in the tuning efficacy. The core concept is the use of an alternative parameterisation of the degrees of freedom in the PFC law. Building on recent insights into the potential of Laguerre functions in traditional MPC (Rossiter, Wang, & Valencia-Palomo, 2010; Wang, 2009), this paper develops an appropriate framework for PFC and then demonstrates that these functions can be exploited to allow easier and more effective tuning in PFC as well as facilitating strong constraint handling properties. The proposed design approach and the associated tuning methodology are developed and their efficacy is demonstrated with a number of numerical examples. © 2019, © 2019 Informa UK Limited, trading as Taylor & Francis Group.

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Author keywords

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Indexed keywords

Engineering controlled terms: Computer applications Control engineering Tuning

Engineering uncontrolled terms: coincidence horizon Constraint handling Design approaches Laguerre functions Predictive functional control Valencia

Engineering main heading: Degrees of freedom (mechanics)

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