Abstract

Title: Fractional IMC-PI based optimum drug scheduling for cancer chemotherapy

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I. Abstract

It is widely known fact, that drug used during chemotherapy has an adverse affect on the patient's body due to its toxic nature. So, a proper drug scheduling is required in order to minimize the toxic effect of chemotheraputic drugs. Therefore, in this article a fractional IMC-PI with one design parameter based closed loop control is proposed for effective drug scheduling. Fractional IMC-PI is an amalgamation of fractional calculus and clasical internal model control (IMC). For comparative analysis, PID, and two degree of freedom PID control schemes are also implemented. The Owl Search Algorithm (OSA) is used to evaluate the optimum value of design parameter of proposed controller. It is revealed from the simulation results that the FOIMC-PI controller delivers an uninterrupted and specific amount of chemotherapy drug dose into the patient body. Further, it is concluded that proposed controller is more robust twowards parametric uncertainity in comparison to other controller.

II. Reference:

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