

عنوان مقاله:

Control of Depth of Anesthesia affected by Variable Heart Beat Rate with a Neuro-Fuzzy Model Predictive Controller

محل انتشار:

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نویسندگان:

Abed Bahraman - *Department of Mechatronics Faculty of Electrical and Computer Engineering, Islamic Azad University, Tehran, Iran*

Mojtaba Ahmadi Khanezar - *Department of Electrical and Control Engineering, Semnan University, Semnan, Iran*

Mohammad Teshnehlab - *Electrical Engineering Faculty, K. N. Toosi University of Technology, Tehran, Iran*

خلاصه مقاله:

Anesthesia is a vital process because anesthetic drugs must be delivered at a proper rate to prevent over dosing and under dosing in patients which can be dangerous for them. So, this process needed to be automatic as the same as other processes. In this study, we use a neuro-fuzzy predictive controller to control the process of anesthesia. pharmacokinetic-pharmacodynamic model is used to describe relationship between input anesthetic agents and output patient endpoint variables. Propofol and remifentanyl are used as inputs of the system. Bispectral index (BIS) as a criterion for the patient's DOA is used as the output of the system. Investigation of the influence of uncertainty due to variable heart rate on the patient's DOA is one objective of this study. Some constraints are considered in the cost function which are important in calculating administrative drug dosage. With MATLAB software, neuro-fuzzy predictive controller is applied on a virtual set of patients with different parameters and we compare the results with the results of the conventional PID controller. Finally, experiments with irregular variable heart rate are done only on nominal patient. Neuro-fuzzy predictive controller controls the process better

کلمات کلیدی:

Neuro-fuzzy predictive control, Identification, Depth of Anesthesia (DOA), Anesthesia, Bispectral index (BIS), Compartmental model (PKPD), Variable heart rate

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