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Title

WORKBENCH FOR AUTOMATIC CONTROL OF ANESTHESIA

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Short presentation

The invention refers to a workbench that allows the testing of different automatic control strategies in anesthesia. Analysis of control systems and results can represent an important step in implementing such automatic control systems in practice. The primary objective of anesthesia is patient comfort, reduction of side effects and avoidance of overdose. Suboptimal and effective control of sedative/analgesic/muscle relaxant doses has a negative impact on the patient, while implying an increase in costs. Anesthesia is intensively used in intensive care patients, especially in mechanically ventilated ones. There are a variety of approaches related to the drugs used, monitoring methods, protocols, especially to meet the different requirements of patients. A solution to unify these varied approaches, related to the intra- and inter-patient variety, consists in the use of automatic control systems that ensure a personalized approach. The workbench allows the testing of different automatic control strategies in anesthesia. It consists of two main components: a patient simulator, respectively a control system to monitor the patient's vital signs, respectively to adjust the dosage of drugs automatically based on a control algorithm. The patient simulator is an application that simulates the effects of drugs (analgesics, sedatives, muscle relaxants) on the state of hypnosis, analgesia and neuromuscular blockade of a patient under anesthesia. The measured variables are transmitted to the control system, represented by a microcontroller. The advantages of the workbench consist in providing the analysis, optimization, testing and validation of a closed-loop control system to assist the anesthesiologist in the phases of induction, maintenance and recovery from anesthesia.

Applicability

Anesthesia is intensively used in intensive care patients, especially in mechanically ventilated ones. The proposed workbench provides the analysis, optimization, testing and validation of a closed-loop control system to assist the anesthesiologist in the phases of induction, maintenance and recovery from anesthesia in any medical field.

Images

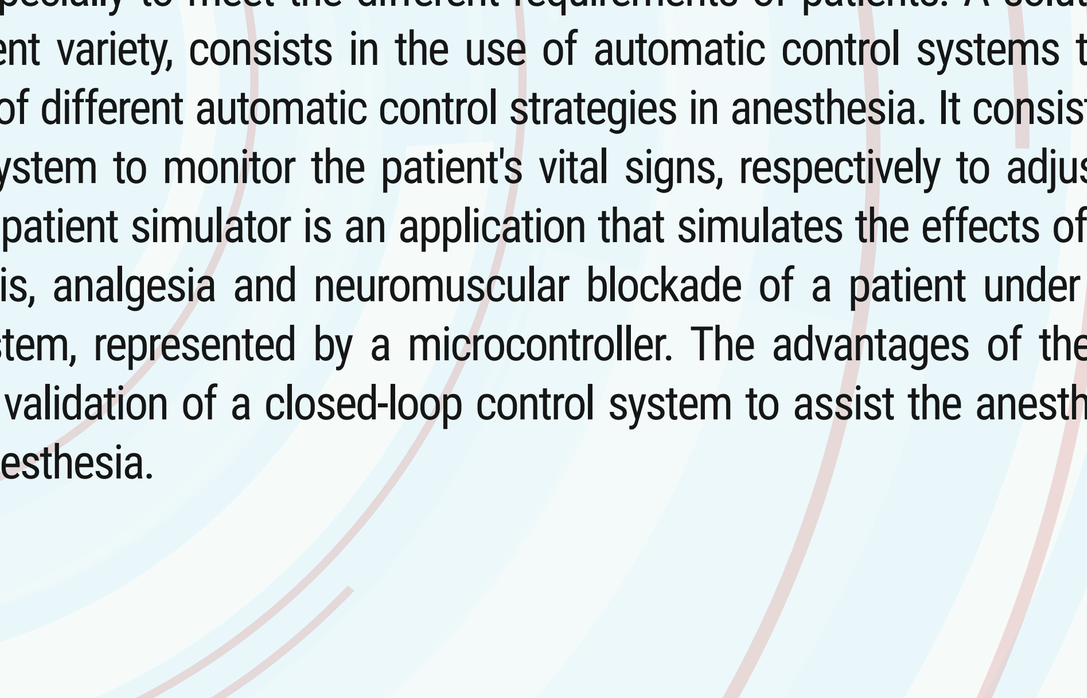

Figure 1. Benchmark design