

A Closed-Loop System for Intravenous and Continuous Insulin Infusion

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Abstract

This paper deals with a closed-loop system for intravenous and continuous insulin infusion. The system comprises four main parts: glucose sensor, signal conditioning and processing hardware, insulin infusion pump and control software module. The sensor captures the blood glucose level and converts it to electrical current. Then, this current is processed in the designed hardware and the suitable value of insulin infusion rate is determined. The insulin pump injects the amount of insulin to the patient according to the determined insulin infusion rate. The developed system is a novel one and clinically has a great importance. The output of this project is a prototype that meets the need of different diabetic patients. This is because this therapeutic system provides wide range of novel applications that enable large groups of patients to benefit from it. The main applications of this system are: continuous monitoring of blood glucose, continuous and efficient therapy of diabetes, early diagnosis and reporting of issues, improvement of health standard of living with lower cost for hospitals, insurance companies, and health-care government agencies, assistance and monitoring of glucose level in home-care settings.