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# Intelligent Control of a Glucose-Insulin Regulatory System

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## Abstract

Many of intelligent systems are based on fuzzy control strategies which describe complex systems mathematical model in terms of linguistic rules. Since the 1980s new techniques have appeared from which fuzzy logic have been applied extensively in medical systems. In this paper, Takagi-Sugeno-Kang [TSK] fuzzy control technique is used to regulate the blood glucose concentration level of a type I diabetes mellitus patient under an intensive insulin treatment in presence of the parameter variations and meal disturbance. The control algorithm incorporates expert knowledge about the treatment of this disease by using first order TSK type fuzzy logic controller to regulate the blood glucose level. The control scheme is based on closed-loop feedback strategy to overcome the variability in the glucose-insulin dynamics from patient to patient. Simulation results show that applying this controller improves very acute conditions of type I diabetic patient during proper time.

**Keywords**: Type 1 Diabetes Mellitus, First Order TSK, Fuzzy Control.

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