

## Back Stepping Sliding Mode Control of Blood Glucose for Type I Diabetes

**Authors :** N. Tadrissi Parsa, A. R. Vali, R. Ghasemi

**Abstract :** Diabetes is a growing health problem in worldwide. Especially, the patients with Type 1 diabetes need strict glycemic control because they have deficiency of insulin production. This paper attempts to control blood glucose based on body mathematical model. The Bergman minimal mathematical model is used to develop the nonlinear controller. A novel back-stepping based sliding mode control (B-SMC) strategy is proposed as a solution that guarantees practical tracking of a desired glucose concentration. In order to show the performance of the proposed design, it is compared with conventional linear and fuzzy controllers which have been done in previous researches. The numerical simulation result shows the advantages of sliding mode back stepping controller design to linear and fuzzy controllers.

**Keywords :** bergman model, nonlinear control, back stepping, sliding mode control

**Conference Title :** ICPCE 2014 : International Conference on Power and Control Engineering

**Conference Location :** Istanbul, Turkey

**Conference Dates :** November 28-29, 2014