

Personalized Glucose Prediction Using Attention-based RNN

Ran Duan

Eli Lilly and Company
E-mail: duan_ran@lilly.com

Abstract: Diabetes have been one of the leading cause of death in the US, which has taken a growing toll on people's health. Numerous treatments have been developed to battle diabetes, however, hypoglycemia, a condition of abnormally low level of blood glucose ($\leq 70\text{mg/dL}$), is a common major adverse event for the diabetes management. Proactive prediction of patients glucose level, especially hypoglycemia event could greatly improve the adherence of insulin therapy and potentially promote the treatment effect. In this paper, we study the problem of blood glucose forecasting and provide a deep personalized solution. Our proposed method has several key advantages over existing methods: 1- it learns a personalized model for each patient as well as a global model; 2- it uses an attention mechanism and extracted time features to better learn long-term dependencies in the data; 3- it introduces a new, robust training procedure for time series data. We empirically show the efficacy of our model on a real dataset.