

Deep Learning Sequence Modelling for Type 1 Diabetes Management

*Ran Cui, Eleni Daskalaki, Md Zakir Hossain, Christopher Nolan, Hanna Suominen**

Research School of Computer Science,
Australian National University
ran.cui@anu.edu.au
hanna.suominen@anu.edu.au

With the fast development towards continuous glucose monitoring (CGM) and artificial pancreas, diabetes healthcare is now entering a big data era. There is great potential for data-driven research, and some applications such as short-term glucose prediction and diabetic retinopathy detection are currently being investigated using machine learning techniques. Our research focuses on using a self-attention mechanism¹ for sequential data modeling in order to achieve short-term glucose prediction in type 1 diabetes. We use CGM, insulin, food intake and heart rate data from the OhioT1DM dataset as inputs, map them into deep complex representations using self-attention mechanism, and predict the future CGM profile in 30min/1h/2h horizons. Compared to the existing studies in this field, our study contributes mainly in two aspects. First, the predictive performance is higher than the existing baseline². Second, unlike all the existing studies, our method is able to provide information on which parts of the input data were important for the prediction. By this added model interpretability³, we hope to contribute towards the adoption and trust of short-term glucose prediction models in real-life.

References

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