Signal Processing Algorithms Implementing the "Smart Sensor" Concept to Improve Continuous Glucose Monitoring in Diabetes

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Abstract

Glucose readings provided by current continuous glucose monitoring (CGM) devices still suffer from accuracy and precision issues. In April 2013, we proposed a new conceptual architecture to deal with these problems and render CGM sensors algorithmically smarter, which consists of three modules for denoising, enhancement, and prediction placed in cascade to a commercial CGM sensor. The architecture was assessed on a data set consisting of 24 type 1 diabetes patients collected in four clinical centers of the AP@home Consortium (a European project of 7th Framework Programme funded by the European Committee). This article, as a companion to our prior publication, illustrates the technical details of the algorithms and of the implementation issues.

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