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Departmental Seminar

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Seminar Title : Neural Hierarchical Interpolation for Glucose Time Series Forecasting in Artificial Pancreas with integration of Physical Activity

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Supervisor : Dr. Nivedita Patra

Venue : BM Department Seminar Room

Date and Time : 16 Dec 2024 (11.00 AM)

Abstract : Blood glucose algorithms for forecasting provide a crucial role in the advancement of decision support systems and closed-loop insulin delivery systems for controlling blood glucose levels in individuals with diabetes. Currently, the diabetes management technologies that can be used rely on continuous glucose monitoring (CGM) sensors. These sensors are tasked with monitoring glucose levels especially from the interstitial fluid (ISF). To prevent hyperglycemic episodes resulting from delayed insulin administration, it is crucial to predict or estimate glucose levels due to the inherent delay between blood sugar levels and ISF glucose levels. The prognosis must be highly accurate to prevent hypoglycemia caused by excessive insulin dosage. This research presents a new neural hierarchical interpolation network that combines a temporal convolutional network with a Self-Attention mechanism. The goal is to produce an accurate forecast of glucose levels. The validation of this model was conducted using clinical data from Type 1 (OhioT1DM). The mean absolute relative difference (MARD) for PH=15, 30, and 60 min on the OhioT1DM clinical Dataset were  $2.65 \pm 0.63\%$ ,  $7.34 \pm 1.44\%$ , and  $13.01 \pm 3.01\%$ , respectively. Keywords: Decision support systems, Continuous glucose monitoring, Interstitial fluid (ISF), Neural hierarchical interpolation, Mean absolute relative difference (MARD) . ALL ARE CORDIALLY INVITED