


Lecture Notes in Networks and Systems 300

300th Volume of LNNS · 300th Volume of LNNS · 300th Volume of LNNS · 300th Volume of LNNS · 300th Volume of LNNS

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Second International Conference on Image Processing and Capsule Networks

ICIPCN 2021

 Springer



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updates

Cite this paper

Sequeira, M.D., Parab, J.S., Pinto, C.F., Naik, G.M. (2022). Enhanced Accuracy for Glucose Prediction Using Neural Network. In: Chen, J.I.Z., Tavares, J.M.R.S., Ilyasu, A.M., Du, K.L. (eds) Second International Conference on Image Processing and Capsule Networks. ICIPCN 2021. Lecture Notes in Networks and Systems, vol 300. Springer, Cham.
https://doi.org/10.1007/978-3-030-84760-9_33

Download citation

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DOI	Published	Publisher Name
https://doi.org/10.1007/978-3-030-84760-9_33	10 September 2021	Springer, Cham
Print ISBN	Online ISBN	eBook Packages
978-3-030-84759-3	978-3-030-84760-9	Intelligent Technologies and Robotics Intelligent Technologies and Robotics (RO)

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Abstract

Monitoring of blood glucose levels is of utmost importance due to the high incidence of diabetes in our society. There is a need for a non-invasive method that is cost-effective and highly accurate. We have utilized absorption signatures at 10 fixed wavelengths in the near-infrared region of optical radiation to predict glucose levels. We have recorded 64 spectra of laboratory samples having glucose, urea, analine, lactate, and ascorbate with concentrations of clinical relevance. Of which 54 were used to calibrate the models and the rest 10 sample spectra are used to test the prediction accuracy. PLSR models gave a root mean square error of prediction as 13.90 mg/dL. The prediction accuracy is further enhanced by implementing Machine Learning using neural network to 6.47 mg/dL. Neural network provides superior performance for the prediction of glucose concentration.