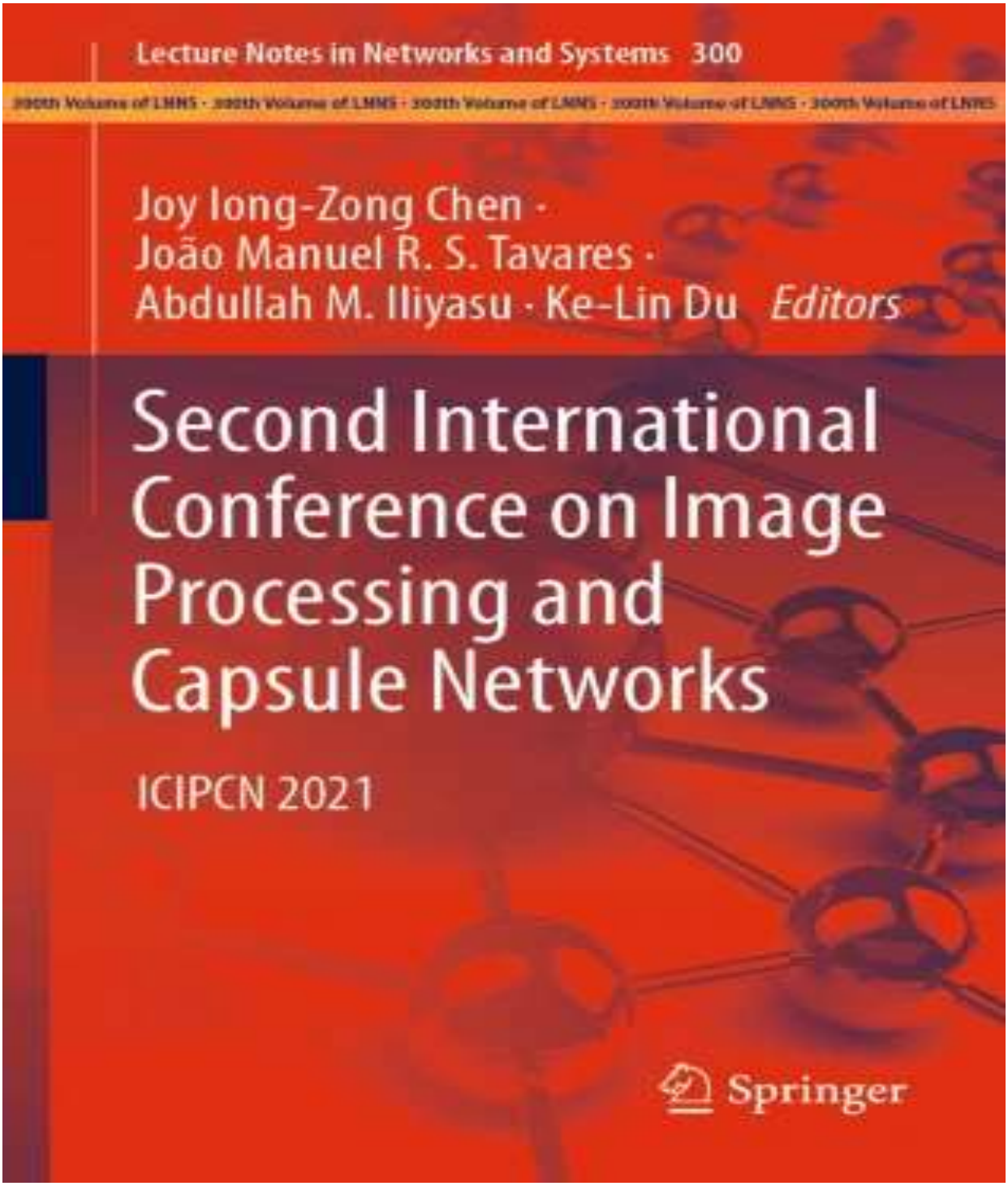
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Abstract

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.