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Air Pollution prediction with a combined approach of Belief Rule Base and Deep Learning**Sami Kabir***Luleå University of Technology, Sweden*

Internet of Things (IoT) has brought sensor data under rising global focus. Prediction is computed by applying reasoning on these sensor data. Hence, prediction accuracy plays a key role to take decisive action. Uncertainties concerning sensor data hinder prediction accuracy severely. Belief Rule Based Expert System (BRBES), a knowledge-driven approach, can deal with such uncertainties to uphold prediction accuracy. BRBES infers predictive output based on its own knowledge base and inference engine. In terms of addressing uncertainties, its prediction accuracy is higher than other knowledge-driven techniques. On the other hand, Deep Learning, a data-driven technique, discovers actionable insight by applying analytics on data. Thus, Deep Learning performs reasoning over available data to predict output. Integrated approach of BRBES and Deep Learning can increase prediction accuracy by dealing with sensor data uncertainties while utilizing its hidden data pattern. Hence, this research proposes a mathematical model to integrate Deep Learning with BRBES and discover nonlinear relationship among applicable variables. We applied parameter and structure optimization on BRBES to optimize it further. We have taken air pollution prediction as application area of our proposed combined model. This approach has been assessed with two distinct datasets. One dataset consists of synthetic images, paired with label of PM2.5 concentrations. Real images, PM2.5 concentrations, and weather data of Shanghai, China constitute the other dataset. Distinction of a hazy image between polluted air and fog has also been made through our proposed model. Our approach has shown higher prediction accuracy than only BRBES and only Deep Learning.

Biography

Sami Kabir has completed his M.Sc. in Computer Science and Engineering (CSE) from Lulea University of Technology (LTU), Skellefteå, Sweden as well as two partner universities of France and Finland under Erasmus Mundus Scholarship of European Commission. His M.Sc. research has been published in well-reputed MDPI 'Sensors' journal, with Impact Factor 3.576. His B.Sc. is from Islamic University of Technology (IUT), Bangladesh. He is presently working as 'Programmer' at Bangladesh Bureau of Statistics (BBS), Dhaka, Bangladesh. His research interests include Artificial Intelligence, Deep Learning, predictive analytics, big data, cloud computing and satellite imagery. Please visit www.SamiKabir.com for details.

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