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OPTIMISATION TECHNOLOGIES
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AI-BASED OPTIMISATION SEMINAR SERIES

DIVERSITY OPTIMISATION IN SYNTHETIC OVER-SAMPLING FOR IMBALANCE LEARNING

Class imbalance is a substantial challenge for machine learning classifiers in many real-world cases. Synthetic over-sampling methods have been developed to overcome this challenge and contributed effectively to improve the performance of classifiers in case of class imbalance. Our study proposes a new approach to address imbalanced data by adopting diversity optimisation to generate synthetic instances for over-sampling the minority class. Diversity optimisation assures that the generated instances are close to the minority group but not identical. It also ensures the optimal spread of the generated instances in the space. We develop two formulations named as Diversity-based Average Distance Over-sampling (DADO) and Diversity-based Instance-Wise Over-sampling (DIWO). We evaluate the proposed formulations' performance by designing experiments using both synthetic and real data with unbalanced classes through area under curve (AUC), F1-score and g-mean measures in comparison with comparable synthetic over-sampling methods.

Dr Hadi A. Khorshidi is a Research Fellow in the School of Computing and Information Systems at the University of Melbourne. He has extensive research experiences in optimisation, machine learning, and uncertainty. Before joining Melbourne, he worked as a Senior Data Analyst in the Institute of Safety, Compensation and Recovery Research where he conducted several health-related data-mining projects for Victorian governmental organisations, Transport Accident Commission (TAC) and WorkSafe Victoria (WSV).

WED 21 JULY 4PM - 5PM AEST

ZOOM MEETING ID: 840 4714 8969; PASSWORD: 546650

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