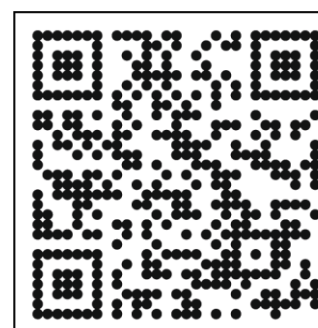




北京大学前沿计算研究中心
Center on Frontiers of Computing Studies, Peking University

静园5号院

青年讲座



Anomaly Detection Based on Isolation Mechanisms



Dr. Ye Zhu

School of Information Technology
Deakin University

🎤 Host: 王亦洲 教授

🕒 2025年10月30日 星期四 10:00

📍 静园五院204室



Abstract

Anomaly detection is a longstanding and active research area that has many applications in domains such as finance, security and manufacturing. However, the efficiency and performance of anomaly detection algorithms are challenged by the large-scale, high-dimensional and heterogeneous data that are prevalent in the era of big data. Isolation-based unsupervised anomaly detection is a novel and effective approach for identifying anomalies in data. It relies on the idea that anomalies are few and different from normal instances, and thus can be easily isolated by random partitioning. Isolation-based methods have several advantages over existing methods, such as low computational complexity, low memory usage, high scalability, robustness to noise and irrelevant features, and no need for prior knowledge or heavy parameter tuning. This talk reviews the state-of-the-art isolation-based anomaly detection methods, including their data partitioning strategies, anomaly score functions, and algorithmic details. It also discusses some extensions and applications of isolation-based methods in different scenarios, such as detecting anomalies in streaming data, time series, trajectory and image datasets.

Biography

Dr Ye Zhu is a Senior Lecturer of computer science with the School of Information Technology, Deakin University, Geelong, VIC, Australia. He received a PhD degree in Artificial Intelligence with a Mollie Holman Medal for the best doctoral thesis of the year from Monash University in 2017. He is also a visiting faculty at Peking University and Nanjing University. His research focuses on the fields of data mining and machine learning, particular topics include clustering analysis, anomaly detection, similarity learning, and their applications for pattern recognition and information retrieval. Dr Zhu has published over 90 papers in top-tier conferences and journals, including SIGKDD, VLDB, ICML, IJCAI, AAAI, AIJ, VLDBJ, ISJ, TKDE, PRJ, JAIR and MLJ. He has served as Program Chair and Program Committee for top international conferences.