

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
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Effective Anomaly Detection and Explanation for Domain Experts

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Abstract:

Anomalies (also called outliers) are data objects that deviate from the remainder of the data. Anomaly detection is the data mining task of finding such deviating objects for error or fraud detection, or for the identification of rare events. In this talk, we present two recent approaches for anomaly analysis that make it easier for non-data mining experts to use these techniques in working with their domain data.

In the first approach, we address the issue of understanding and validating anomalies. Traditionally, anomaly detection simply returns a set of anomalies or a score indicating the degree of anomaly as the only information to the user. This makes it difficult for the user to then understand why an object is considered an anomaly or in which way it deviates from the remainder of the data. We propose a method for finding possible explanations that show how the object deviates from the remainder of the data, and we provide algorithmic solutions for their computation. In the second approach, we study how to incorporate additional domain information on the nature of the anomalies into the anomaly detection process, and how this combination can be used to build more robust detection methods. This robustness makes it easier for non-data mining experts to use these methods in working with data also when the nature of the anomalies is unknown.

Host: Yongluan Zhou