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## STATISTICAL ANALYSIS AND DATA MINING

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### **Discriminative frequent subgraph mining with optimality guarantees**

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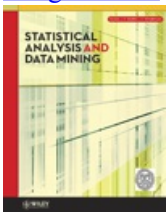
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## Abstract

The goal of frequent subgraph mining is to detect subgraphs that frequently occur in a dataset of graphs. In classification settings, one is often interested in discovering *discriminative* frequent subgraphs, whose presence or absence is indicative of the class membership of a graph. In this article, we propose an approach to feature selection on frequent subgraphs, called *CORK*, that combines two central advantages. First, it optimizes a submodular quality criterion, which means that we can yield a near-optimal solution using greedy feature selection. Second, our submodular quality function criterion can be integrated into gSpan, the state-of-the-art tool for frequent subgraph mining, and help to prune the search space for discriminative frequent subgraphs even *during* frequent subgraph mining. Copyright © 2010 Wiley Periodicals, Inc. Statistical Analysis and Data Mining 3: 302-318, 2010

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