

Lecture Notes in Artificial Intelligence

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Privacy and Security Issues in Data Mining and Machine Learning

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Preface

This volume contains the papers presented at PSDML 2010: ECML/PKDD Workshop on Privacy and Security issues in Data Mining and Machine Learning held on September 24, 2010 in Barcelona, Spain.

The purpose of the workshop was to bring together researchers from different areas of data mining and machine learning, with an interest in privacy and security, to discuss recent results and open problems and to enable future collaborations. We received 21 submissions, each of which received at least 2, and on average 3.6, reviews. We wish to thank the reviewers for their excellent feedback to the authors, which directly contributed to the workshop's success. The committee decided to accept 11 papers for an engaging full-day program touching upon multiple aspects of the workshop's theme.

One theme was data privacy, i.e., how to perform computations on data without revealing the data itself or any sensitive knowledge that can be mined from the data. This was explored for general computations (such as the eigenvector computation paper by Pathak and Raj and the work by Grosskreutz et al. on group discovery), for anonymous data publication (such as the work by Cano and Torra, who studied the suitability of additive noise to protect sensitive microdata while taking data edits into account), and for supervised learning (such as the work by Pathak and Raj on Gaussian classification and the Gavin and Velcin paper on quadratic error minimization).

Security applications, focusing on detecting malicious behavior in computer systems, formed another major part of the workshop schedule. Kruger et al. contribute a method, employing n -grams and matrix factorization, for automatically mapping network payloads onto a low-dimensional space, enabling visualization and anomaly detection. In a similar vein, Mao et al. use generalized n -grams to represent and detect attacks in network traffic, while the problem of filtering in recommender systems is tackled using a soft two-tier classifier employing bag-of-words and other message statistics as features.

Finally, the open problems and position papers session resulted in interesting and fruitful discussions. Charles Elkan presented the idea of using importance weights to preserve privacy in data mining, and Blaine Nelson gave a detailed overview of an adversarial setting where the opponent actively tries to evade detection by the classifier, which raises many interesting theoretical questions.

We would once more like to thank the workshop participants for their interesting contributions, the reviewers for their diligent work and the ECML/PKDD Workshops Chairs for making this workshop possible.

November 2010

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