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Algorithmic tools for data-oriented law enforcement

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Stellingen

Propositions belonging to the thesis

Algorithmic Tools for Data-Oriented Law Enforcement

by Tim Cocx

1. The usage of a static, pre-constructed visualization of a distance matrix combined with its underlying clustering as a basis for visual extrapolation can yield accurate prediction results for new instances with a very low computational complexity. [this thesis]
2. In applying data mining efforts in the law enforcement arena, it is of the essence to visualize the results to analysts unfamiliar with certain data structures. The “folder-browsing” paradigm for visualizing a trie is a good example that retains this possibility. [this thesis]
3. An inherent problem with data on crimes is the abundance of information in one and the lack of information in another case, effectively rendering the usage of support useless. A method that calculates the likeliness of occurrences taking place, given the amount of respective information available, is much more suitable. [this thesis]
4. Given the common notion of string analysis, the application of some algorithms originating from DNA analysis can yield reliable results in an efficient way for the analysis of criminal careers. [this thesis]
5. The data mining community has reached a point where most advances are ad-hoc improvements on existing base-algorithms that still perform well in contemporary application domains. These efforts ignore the situation that the application of data mining methods in itself is such a large improvement that more subtle gains in performance are usually unwarranted.
6. Although the possible gains are plenty and a clear desire for data solutions exist, the implementation of data mining initiatives in the Dutch law enforcement arena is slow. This is caused by organizational difficulties in data warehousing and the judicial constraints that govern the application of personal data in criminal investigations.
7. The release of any computer guided statistical analysis tool, including all data mining applications, should come with a clear warning to any end-user unfamiliar with statistics and its ethical application in daily life.

8. Presenting an empirical comparison of newly discovered data mining approaches on different, benchmarked data sets is desirable, but not always possible, especially when the algorithms under evaluation are highly domain specific.
9. Some aspects of a political coalition cabinet system violate principles underlying democracy. Such a format enables popular minorities to establish legislation through wheeling and dealing. A one party cabinet, forced to carry each proposition through the chambers, is a suitable alternative.
10. The radically different nature of the exclusive OR (XOR) operator in natural language and the technical sciences warrants a name change of this operator in case of the latter. “The *parity operator*” would be a good alternative to avoid the current confusion.
11. For contemporary computer scientists, cunning writing skills are more beneficial than an aptitude for research.
12. As can be observed in trends within international handball and basketball, volleyball techniques, concepts and tactics are taking a more prominent role in the development of major sports worldwide.