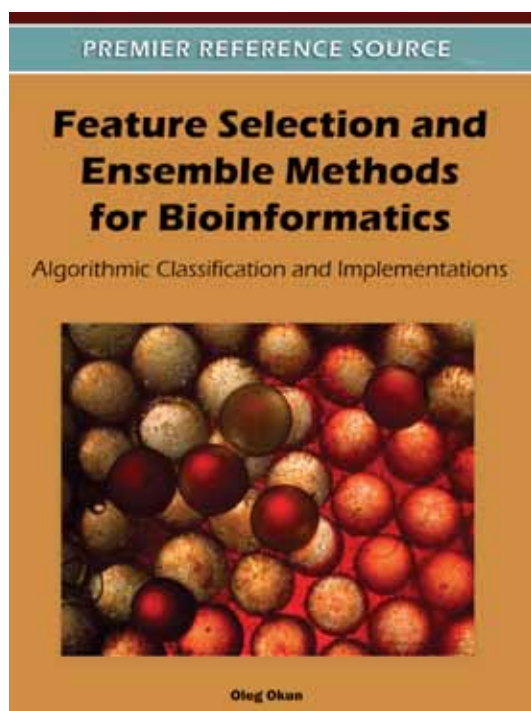


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Feature Selection and Ensemble Methods for Bioinformatics: Algorithmic Classification and Implementations



Oleg Okun (SMARTTECCO, Malmo, Sweden)

Machine learning is the branch of artificial intelligence whose goal is to develop algorithms that add learning capabilities to computers. Ensembles are an integral part of machine learning. A typical ensemble includes several algorithms performing the task of prediction of the class label or the degree of class membership for a given input presented as a set of measurable characteristics, often called features.

Feature Selection and Ensemble Methods for Bioinformatics: Algorithmic Classification and Implementations offers a unique perspective on machine learning aspects of microarray gene expression based cancer classification. This multidisciplinary text is at the intersection of computer science and biology and, as a result, can be used as a reference book by researchers and students from both fields. Each chapter describes the process of algorithm design from beginning to end and aims to inform readers of best practices for use in their own research.

Topics Covered:

- Bayesian approach to gene selection
- Classification tree
- Data classification
- Feature and gene selection
- Game theory
- Kernel-based feature selection
- MATLAB code
- Naïve Bayes
- Nearest neighbor classification
- Support vector machines

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Oleg Okun got an MSc degree in radiophysics and electronics in 1990 from Belarusian State University and a PhD degree in computer science in 1996 from the United Institute of Informatics Problems (Belarus). The topic of his PhD thesis was the distance transform and its application to document image analysis. From 1998 to 2008 he was with Machine Vision Group at the University of Oulu (Finland), where he taught several courses and did research on document image analysis and machine learning (with application to bioinformatics). Starting from June of 2008 he led a research team in the Swedish start-up company Precise Biometrics. His tasks there included biometric (fingerprint) algorithms, e-identity based on biometrics, biometric solutions for embedded systems, and biometric standardization. In July of 2009 he was the head of the Swedish delegation at the annual ISO/IEC JTC 1 SC 37 (Biometrics) meeting, where his contribution to one of the international standards has been approved. He has 75 publications, including two co-edited books published by Springer-Verlag in 2008 and 2009. He is the co-organizer of three international workshops on ensemble methods (SUEMA'2007, SUEMA'2008, and SUEMA'2010). His professional interests include a wide range of topics such as machine learning, data mining, statistics, bioinformatics, biometrics, extreme programming, extreme project management, strategic IT management, and cloud computing.

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