

Resource Summary Report

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Effective early disease risk assessment with matrix factorization on a large-scale medical database

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Protocol Information

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Summary: The early assessment of disease risk is an emerging topic in medical informatics. If diseases are detected at an early stage, prognosis can be improved and medical resources can be used more efficiently. A number of recent studies have considered risk factor analysis approaches, such as association rule mining, sequential rule mining, regression, and medical expert advice. In this study, for improving disease risk assessment, non-negative matrix factorization and support vector machine (SVM) were integrated to discover important and implicit risk factors. To make the method easy to follow, here we provide an experimental protocol. This experimental protocol comprises three main stages: data preprocessing, risk factor optimization, and early disease risk assessment. To discover the optimized risk factors, the NMF algorithm with parameter optimization was used for constructing the NMF-based matrix. In the assessment model learning and early disease risk assessment stages, the machine learning classifier SVM was used for disease modeling with the NMF-based matrix, yielding the final disease risk assessment, which serves as an excellent reference for physicians and patients.

Associated Publications: Chin C, Hsieh S, Tseng VS (2018) eDRAM: Effective early disease risk assessment with matrix factorization on a large-scale medical database: A case study on rheumatoid arthritis. PLoS ONE 13(11): e0207579. doi: [10.1371/journal.pone.0207579](https://doi.org/10.1371/journal.pone.0207579)

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