

Optimizing Adverse Drug Reaction Surveillance: Integrating Latent Semantic Analysis and Artificial Neural Networks in Pharmacovigilance

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Abstract:

An essential part of pharmacovigilance is ADR (Adverse Drug Reaction) detection, which looks for possible drug side effects. For this objective, combining Artificial Neural Networks (ANN) with Latent Semantic Analysis (LSA) may be a useful strategy. ADR detection is identifying adverse drug reactions by examining textual data, such as patient reports, social media posts, or medical records. The objective is to categorize text into groups like "ADR" and "non-ADR." The process of extracting and displaying the contextual meaning of words in a corpus of text is referred to as latent semantic analysis or LSA. The term-document matrix's dimensionality is decreased by the application of Singular Value Decomposition (SVD). For ADR detection ANN models offer several benefits over conventional classifiers Logistic Regression LR, SVM, and Random Forest (RF) and can integrate multi-modal data, manage intricate non-linear relationships, and comprehend textual context. Hence we propose a LSA model with ANN classifier for the detection of ADR from text. The result shows that LSA with ANN classifier outperforms traditional classifiers like (SVM, Logistic Regression (LR), and Random Forest (RF) etc).

Keywords:

ADR, LSA, SVM, LR, Random Forest, ANN.