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Predicting Common Vulnerability Scoring System (CVSS) Scores Using Temporal Metric and Probabilistic Neural Network (PNN)

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Abstract: Research has been done predicting Common Vulnerability Scoring System (CVSS) scores based on vulnerability textual descriptions using the base CVSS scores. In this paper, an outline of a method to predict the CVSS scores using the temporal metric and a Probabilistic Neural Network (PNN). Textual data is extracted from documents using an established search algorithm to isolate the features needed by the PNN to formulate a score of the vulnerabilities within the remaining textual data. CVSS is the predominant gauge for assessing vulnerabilities within software systems. Generally, scores are intended to be quantitative and objective. Unfortunately, this is not the case with CVSS scores, which tend to have a largely subjective base for determining the vulnerabilities. This expert knowledge is not always available or accessible, so a more accurate and objective method is proposed in this paper. Although the data set is not large, the premises is to demonstrate the objectivity of the results and understanding that the more time a vulnerability ages in a system, the risk increases that the vulnerability can critically impact a system.

Keywords: Probabilistic Neural Network (PNN), Textual Data Mining, Common Vulnerability Scoring System (CVSS), Risk Scoring, Threat Analysis