

Fast Approach to Simultaneously Determine Existence and Classification for String Patterns in a Payload

馬恆, 鄭弘裕

Industrial Management

Management

hengma@chu.edu.tw

Abstract

We propose an approach for simultaneously determining whether a target string is included in a payload database, as well as the class attribute pertaining to the string. The proposed approach employs a Bloom Filter and a CMAC neural network, which compose a two-layer architecture. The first layer, the Bloom Filter layer, is responsible for a preliminary checking for the existence of the target string. The CMAC neural network, on the second layer, further eliminates false positives resulted from the first layer, while the class attribute of the target string is simultaneously responded. We utilized the car license plate in Taiwan for verifying the effectiveness and efficiency of the proposed approach. The class attributes included make, type, color of the cars. Experimental results showed the proposed approach is suitable to serve as a frontier for a thorough database searching. With proper control of the memory usage, the proposed approach is also ideal for mobile devices where a consistent query time could be achieved regardless of the number of the plate numbers. The error rate for misinterpretations of class attribute in the second layer is also considerably small.

Keyword : CMAC, Bloom Filter, Existence, Classification, String Patterns