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The Latin American laws of correct nutrition: Review, unified interpretation, model and tools.

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ABSTRACT

Background: The "Laws of Correct Nutrition": the Law of Quantity, the Law of Quality, the Law of Harmony and the Law of Adequacy, provide the basis of a proper diet, i.e. one that provides the body with the energy required and nutrients it needs for daily activities and maintenance of vital functions. For several decades, these Laws have been the basis of nourishing menus designed in Latin America; however, they are stated in a colloquial language, which leads to differences in interpretation and ambiguities for non-experts and even experts in the field.Methods: We present a review of the different interpretations of the Laws and describe a consensus. We represent concepts related to nourishing menu design employing the Unified Modeling Language (UML). We formalize the Laws using the Object Constraint Language (OCL). We design a nourishing menu for a particular user through enforcement of the Laws.Results: We designed a domain model with the essential elements to plan a nourishing menu and we expressed the necessary constraints to make the model's behavior conform to the four Laws. We made a formal verification and validation of the model via USE (UML-based Specification Environment) and we developed a software prototype for menu design under the Laws.Conclusion: Diet planning is considered as an art but consideration should be given to the need for a set of strict rules to design adequate menus. Thus, we model the "Laws of Nutrition" as a formal basis and standard framework for this task.

Keywords: Diet planning; Domain model; Laws of Nutrition; Menu planning; Model validation; Object Constraint Language (OCL); Software; Unified Modeling Language (UML)

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A Kernel-Based Predictive Model for Guillain-Barré Syndrome

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ABSTRACT

The severity of Guillain-Barré Syndrome (GBS) varies among subtypes, which can be mainly Acute Inflammatory Demyelinating Polyneuropathy (AIDP), Acute Motor Axonal Neuropathy (AMAN), Acute Motor Sensory Axonal Neuropathy (AMSAN) and Miller-Fisher Syndrome (MF). In this study, we use a real dataset that contains clinical, serological, and nerve conduction tests data obtained from 129 GBS patients. We apply Support Vector Machines (SVM) using four different kernels: linear, Gaussian, polynomial and Laplacian to predict four GBS subtypes. We compare SVM results with those of C4.5. We evaluated performance under both 10-FCV and train-test scenarios. Experimental results showed performance of both classifiers are comparable. SVM slightly outperformed C4.5 with Polynomial kernel in 10-FCV. And it did with Laplacian, polynomial and Gaussian kernels in train-test. This is an ongoing research project and further experiments are being conducted.

Keywords: SVM kernels, Classification, Performance evaluation AUC

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