Prediction

- Letter to the Editor 'Nomogram for Deep Vein Thrombosis Prediction Post-Endovascular Thrombectomy in Acute Ischemic Stroke: A Retrospective Multicenter Observational Study'
- Global, regional, and national burden of older adults peripheral nervous system tumors (1990-2021): a systematic analysis of incidence, dalys, and deaths with projections to 2050
- Blood-Brain Barrier Disruption Predicts Poor Outcome in Subarachnoid Hemorrhage: A Dynamic Contrast-Enhanced MRI Study
- Multimodal Model for Non-Invasive Detection of DRD2, SSTR2 and ESR1 Receptor Profiling in Pituitary Neuroendocrine Tumors: A Retrospective Study
- Development of a Radiomic-clinical Nomogram for Prediction of Survival in Patients with Nasal Extranodal Natural Killer/T-cell Lymphoma
- Advances and Integrations of Computer-Assisted Planning, Artificial Intelligence, and Predictive Modeling Tools for Laser Interstitial Thermal Therapy in Neurosurgical Oncology
- Depression after aneurysmal subarachnoid hemorrhage: development of a screening tool and discharge user interface
- Hospital frailty risk score in predicting outcomes after simultaneous colon and liver resection for colorectal cancer liver metastasis in older adults: Evidence from the Nationwide Inpatient Sample 2015-2018

see Frankfurt Grading system for the prediction of the need for cerebrospinal fluid drainage following posterior fossa tumor surgery

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Although advances in prediction accuracy have been made with new machine learning methods, such as support vector machines and deep neural networks, these methods make nonlinear machine learning models and thus lack the ability to explain the basis of their predictions. Improving their explanatory capabilities would increase the reliability of their predictions.

The objective was to develop a factor analysis technique that enables the presentation of the feature variables used in making predictions, even in nonlinear machine learning models.

A factor analysis technique has consisted of two techniques: the backward analysis technique and factor extraction technique. They developed a factor extraction technique extracted feature variables that was obtained from the posterior probability distribution of a machine learning model which was calculated by the backward analysis technique.

In evaluation, using gene expression data from prostate tumor patients and healthy subjects, the prediction accuracy of a model of deep neural networks was approximately 5% better than that of a model of support vector machines. Then the rate of concordance between the feature variables extracted in an earlier report using Jensen-Shannon divergence and the ones extracted in this report using backward elimination using Hilbert-Schmidt independence criteria was 40% for the top five variables, 40% for the top 10, and 49% for the top 100.

The results showed that models can be evaluated from different viewpoints by using different factor extraction techniques. In the future, we hope to use this technique to verify the characteristics of features extracted by factor extraction technique, and to perform clinical studies using the genes, we extracted in this experiment [1)].

Prediction score

1)

Suzuki M, Shibahara T, Muragaki Y. A Method to Extract Feature Variables Contributed in Nonlinear Machine Learning Prediction. Methods Inf Med. 2020 May 7. doi: 10.1055/s-0040-1701615. [Epub ahead of print] PubMed PMID: 32380557.