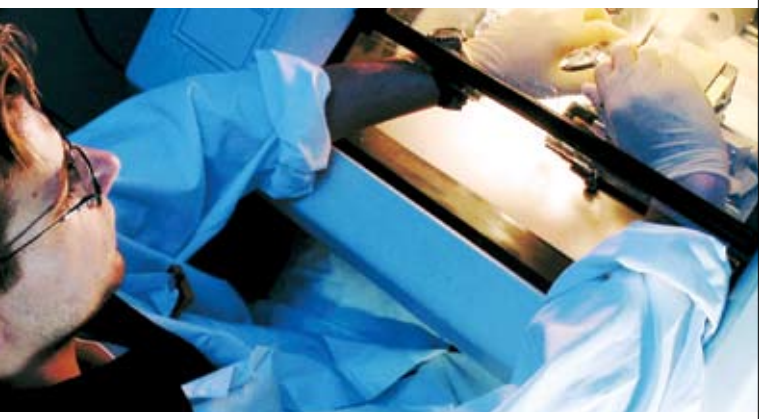
CASE STUDY KATHARINENHOSPITAL

NeuralTools™ in Medicine

"In making diagnoses, NeuralTools accurately predicted 98.58% of the training set cases and 95.00% of the testing set cases."



Applications of NeuralTools

Loan underwriting · Credit scoring · Credit card fraud detection Insurance underwriting · Reserves estimation · Investment prediction · Energy price prediction · Real estate appraisal Specimen identification · Protein sequencing · Tumor and tissue diagnosis · Heart attack diagnosis · New drug effectiveness · Missile targeting · Quality control and Six Sigma · Highway maintenance Telecommunication line fault detection · Prediction of air and sea currents · Air and water quality · Archaeological artifact identification and dating · Beer and wine flavor prediction · Identification of potential terrorists · Criminal behavior prediction

PALISADE

PALISADE.COM

NeuralTools Used for Tumor Diagnosis

Product: NeuralTools
Application: Medical Diagnosis
Organization: Katharinenhospital
Industry: Healthcare

Researchers at the Katharinenhospital in Stuttgart, Germany use advanced data analysis tools to diagnose tumors. Dr. José R. Iglesias-Rozas, Associate Professor at the Universität Tübingen and researcher at the Laboratory of Neuropathology in the Institute for Pathology at Katharinenhospital, is using Palisade's NeuralTools™ for histological classification and grading of tumors. Histological classification of tumors is based on microscopic study of the tissue. Tumor grading is a very important aspect of diagnosis since the treatment and the outcome of each case depends greatly on the assigned grade.

Neural Networks Provides the Answer

Quantitative diagnostic assessments in histopathology (microscopic changes in diseased tissue) must frequently deal with uncertain information and vague linguistic terms. Final decisions are rarely based on the evaluation of a single diagnostic clue; rather, multiple pieces of evidence are routinely observed, and the certainty of combined evidence supports the final diagnosis. Neural networks analysis, which intelligently predicts outcomes based on multiple pieces of input data, is a natural fit for such medical diagnosis applications.

The Tumor Diagnosis Study

The aim of Dr. Iglesias-Rozas's study was to predict the degree of malignancy of tumors based on ten discrete characteristics in 786 patients. Histological sections of 786 different human brain tumors were collected. Ten histological characteristics were assessed in each case, describing the presence of a specific histological feature on a scale of zero to three, with zero being the absence of the feature, and three meaning abundant presence of the feature. NeuralTools was then used to predict a malignity coefficient between 1.00 and 4.00.

NeuralTools Predicts the Result

Six hundred twenty nine tumors were available for the NeuralTools training set, and 157 independent cases were used as the NeuralTools test set. NeuralTools accurately predicted 98.58% of the training set cases and 95.00% of the testing set cases!

According to Dr. Iglesias-Rozas, "I am delighted with the program for its speed and the easy handling. I was very happy to work with numeric and category variables." He adds, "The program is super quick."

What's next for NeuralTools and the study? Dr. Iglesias-Rozas explains, "We have over 30 years of data and more than 8000 patients with different brain tumors to assess next."