

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## CLASSIFICATION OF MAIN COMMERCIAL SPECIES OF SHRIMP USING ARTIFICIAL NEURAL NETWORKS

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The idea to carrying out this project emerged from the difficulty of the companies that does works in this sector to obtain subsidies to correctly define the packaging data of its products and to fill in the documents required from the regulatory agencies. This fact results in non-efficiency and effectiveness in the process, in addition to erros that may cause major disorders and leave wild open space to tax frauds. Although to the considerable commercialization of extractive and culture shrimp there are still no eletronic devices to identify the species within the industry. Currently the species recognition has done visually by a professional trained in quality control of the industry in addition to documents provided by vessels or producers. A possible solution would be through techniques of Digital Image Processing, such as the digital classification of images with artificial neural networks which identify and learn to recognize spectral patterns by analyzing the digital value of an image pixel. The construction of the confusion matrix is a technique used to analyze the performance of sorting systems. The purpose of this work was to verify the potential artificial neural networks using to classify the main commercial specie of shrimps in the state of Santa Catarina. The species used were *Farfantepenaeus paulensis* e *Farfantepenaeus brasiliensis*, *Pleoticus muelleri*, *Xiphopenaues kroyeri*, *Artemesia longinaris*, *Litopenaeus vannamei* and *Litopenaeus schmitti*. The shrimps were individually photographed on a sheet of white paper with mobile phone Samsung S8 model. The photographs were taken with whole shrimps, eviscerated and eviscerated with telson, in the dorsal, ventral and lateral positions. The images were analyzed by the Orange program, version 3.11, Image Analytics package. Logistic regression was the method considered in the artificial neural network model and stratified cross-validation for sampling. The evaluation of the model presented of 0.995 for the AUC (Area Under Curve) and accuracy of 0.937 when all the images were analyzed together. When analyzing from the images of the stratified species by position the AUC and precision indices fell to 0.935 and 0.626, respectively. This result occurs because of reduced amount of photos when stratified which did not allow the model to identify patterns for some species. The results demonstrated that the models based on neural networks can be used to classify commercial shrimp species.

**Keywords:** data mining, deep learning, image identification, matrix of confusion

Promoção e Realização:



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