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Image processing features extraction on fish behaviour   (Book Chapter)

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Abstract   ∨ View references (22)

This chapter demonstrates the pipeline from data collection until classifier models that achieve the best possible model in identifying the disparity between hunger states. The pre-processing segment describes the features of the data sets obtained by means of image processing. The method includes the simple moving average (SMA), downsizing factors, dynamic time warping (DTW) and clustering by the k-means method. This is to rationally assign the necessary significant information from the data collected and processed the images captured for demand feeder and fish motion as a synthesis for anticipating the state of fish starvation. The selection of features in this study takes place via the boxplot analysis and the principal component analysis (PCA) on dimensionality reduction. Finally, the validation of the hunger state will be addressed by comparing machine learning (ML) classifiers, namely the discriminant analysis (DA), support vector machine (SVM) and k-nearest neighbour (k-NN). The outcome in this chapter will validate the features from image processing as a tool for identifying the behavioural changes of the fish in school size. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd 2020.

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Author keywords

(Boxplot analysis)   (Classification)   (Dynamic time warping)   (Features selection)   (K-means clustering)   (PCA)

Indexed keywords

Engineering
controlled terms: (Classification (of information))   (Discriminant analysis)   (Feature extraction)   (Fish)
(Image segmentation)   (K-means clustering)   (Nearest neighbor search)   (Support vector machines)

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