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Author: Jose Manuel Miranda Marcelo Romero

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A prototype to measure rainbow trout's length using image processing

Jose Manuel Miranda, Marcelo Romero*

*Facultad de Ingeniería, Universidad Autónoma del Estado de México. Cerro de Coatepec
s/n. Ciudad Universitaria, 50100, Toluca, Estado de México, México*

Abstract

In rainbow trout farming, automatic measuring for classification is an open problem, when in most of small farms this work is done manually within a laborious process and achieving inaccurate measurements. In this research we present state of the art results in rainbow trout (*Oncorhynchus mykiss*) length estimation within a water flow using image processing. For this purpose, we have designed, implemented and evaluated a novel measuring prototype which allows the fish to swim throughout its channel in order to be measured and classified, taking advantage of the rainbow trout instinctive behaviour in swimming against the water flow. Our prototype is provided with a vision component which is able to detect and measure the rainbow trout online by capturing and processing downward-view images when the fish passes below a camera. A fish is detected into the system when it crosses a control point, event that recalls our measuring process. To measure, we approximate a third order regression curve to the fish body to estimate its length. In our experimental evaluation we are achieving 1.413 *cm* mean absolute error (MAE) when estimating rainbow trout lengths. This is an encouraging result that allows us to draw different venues for future work based on our experimental findings.

Keywords: Measuring fish prototype, rainbow trout, image processing

*Corresponding autor: Tel. +52 722 214 08 55

Email address: mromeroh@uaemex.mx (Marcelo Romero)

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