A PROPOSED FISH COUNTING ALGORITHM USING DIGITAL IMAGE PROCESSING TECHNIQUE

By

Ibrahim Aliyu[1]; Kolo Jonathan Gana[2]; Aibinu Abiodun Musa[3]; James Agajo[4]; Abdullahi Mohammed Orire[5]; Folorunso Taliha Abiodun[6]; Mutiu Adesina Adegboye[7]

[1,2,4]Department of computer Engineering,
Federal University of Technology, Minna.
[3,6]Department of Mechatronics Engineering,
Federal University of Technology, Minna.
[5]Department of Water Resources, Aquaculture and Fisheries,
Federal University of Technology, Minna.
[7]Department of computer Engineering,
Federal University Oye-Ekiti, .

ABSTRACT

Fish product contributes a significant amount of protein demand of human nutrition and made up of about 16% of human diet all around the world. However, Fish production is one of the factors that have been a bottleneck for development of fish farming for most developing countries such as Nigeria. One of the major and time consuming task in production is providing an accurate estimate of the fingerlings to farmers. The methods of counting fingerlings in most developing countries is done manually. These manual methods are inevitably influence by inaccuracies and exposer of the fingerlings to unnecessary stress that could lead to death. This paper proposed a fingerling counting algorithm using digital image technique. To achieved this aim, a robust segmentation algorithm, feature extraction algorithm and machine learning algorithm for fingerlings classification and counting are hereby formulated. At the end of this research, the proposed algorithm is expected to count different sizes of fingerlings with high accuracy.

Keywords: Algorithm, Aquaculture, Counting, Digital Image Processing, Fingerlings, Fish

INTRODUCTION

Fish product contributes a significant amount of protein demand of human nutrition and its consumption have dramatically increased- about 27 million tons of fish were consume during 1948 and this has increase to about 145 million tons during 2007. Fish product is about 16% of human diet all around the world (Dowlati, de la Guardia, & Mohtasebi, 2012).

In some of the developing countries such as Nigeria, Fingerlings production has increased from 3 million per year in 2001 to more than 30 million per annum in 2006; Several large producers are delivering more than 300,000 fingerlings monthly (Potongkam & Miller, 2006). Despite this increase in fingerlings production, the industries still suffer shortages of high-quality Fingerling; This has driven fish farms/companies to establish hatcheries to fast-track their production (Daniel, 2015). For the past 40 years, fingerlings production has been a bottleneck for the development of fish farming in Nigeria and counting is one of the problems faced by hatcheries (Potongkam & Miller, 2006).

One of the essential most important operations in aquaculture is counting (Zion, 2012). This is very important

