21 Sudo Coders

シンガポール
ポリテクニック

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自由部門

1. Introduction

Sudo Coders is a team of two Year Two students from Singapore Polytechnic, Diploma in Computer Engineering. We are inspired to build an ecosystem targeted towards fishing industries and consumers, to transform tuna into a sustainable protein source worldwide. This is achieved with advanced computing technologies, such as: Artificial Intelligence (AI); Blockchain; Cloud Computing; IoT; and Machine Vision (MV).

2. Problem & Research

Tunas are viable sources of protein, caught plentifully around the world, including Bluefin, Bigeye, Yellowfin, Albacore, and Skipjack. The Atlantic Bluefin tuna averages at 2m in size typically over 12 years, making it a primary target of over-fishing. Spawning stock biomass estimates have declined by around 85% in the years since 1973 through 2009, showing no signs of improvement. Furthermore, the International Seafood Sustainability Foundation suggests that the prevalence of purse-seine nets in the fishing industry impacts the survivability of tuna in general. Consequently, the Atlantic Bluefin has been thusly listed as a critically endangered species, with the "Implementation of effective conservation and management measures" being critical to conservation efforts, according to the International Union for Conservation of Nature. National Geographic states that the "catch-and-release" method can be employed to maintain the ecosystem. However, the traditional method for 'catch-and-release' utilizes a measuring gauge, which is tedious, inaccurate, and labor-intensive. Consumers cannot make an informed decision when purchasing unsustainable produce, which drives the supply of tuna to meet the insatiable demand.

3.1 Our solution

We propose a novel computing framework, named "TSUNA.i" (ツナ AI), comprising of the following features:

(i) Identification of the Species, Size, and Weight at time of catch, which help in deciding the release of non-conforming tuna such as juveniles, and by-catches.

(ii) Sampling and predicting the catch quality, to release low quality tuna. By releasing the uneconomical catches, by-catches can serve as a food source for commercially viable tuna and improve the spawning rate of tuna biomass stock. Juveniles are also given time to mature.

(iv) Uploading of acquired catch data from the fishing vessel to the Cloud for research, such as analyzing patterns and correlations to advise the fishery regulators.

(v) Regulators, Fishing Companies, Wholesalers, Retailers, and Consumers can consume the produce with confidence, as there is a guarantee of authenticity and transparency within the entire supply chain.

3.2 System Diagram and Operation
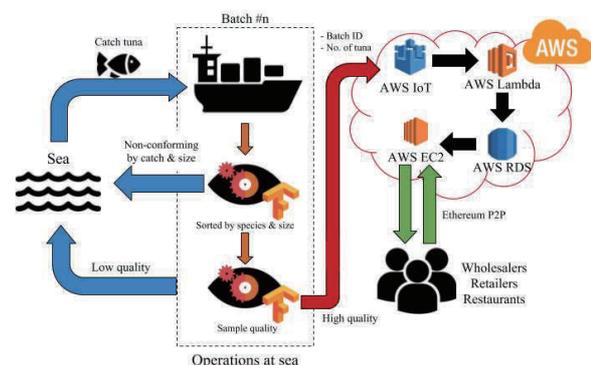
3.3 Future plans

Future development plans include: trial testing with industry partners; and predicting the price of the tuna based on the data collected, to assist decision making for procurement.