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Expertise
available



Disruptive AI Innovation

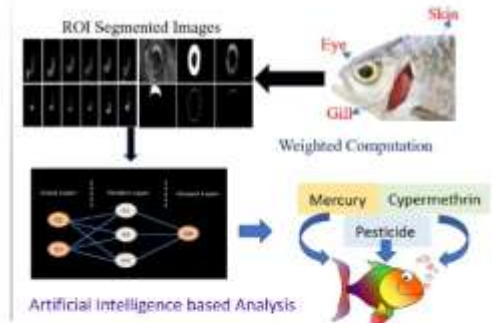
Fish Freshness and Quality Assessment like exposure to Pesticides / Heavy metals using Artificial Intelligence



Research Problem:

Computer Vision based Artificial Intelligence based methods:

- 1.If the Fish was exposed to common Toxic substances like **pesticides** (Cypermethrine) and Industrial wastes (**Mercury**).
- 2.Freshness Estimation (estimation of time from the time it was harvested).



A team Marine Scientist & AI Scientists worked in this Interdisciplinary research to check the freshness of Fish and find out **if the fish was exposed to Toxic substance using AI based methods** with results reported Journal Articles*.

Highlights of the work:

- **Method** : Focal Tissues like Eyes and gills are segmented from the image and AI based computer vision methods are used to detect the freshness coefficient and presence of Toxic Substance.
- Research works are done in Spatial Domain, Discrete Wavelet Transform to extract the features and the discriminatory features are fed to AI models. **Different supervised classification techniques** are used and **Good accuracy** is achieved in each proposed method.
 - ✓ Framework is developed to label the freshness ranges of fish and achieved an accuracy of 94%.
 - ✓ Accuracy of 96.87% is achieved for identification and detection of pesticide [Cypermethrine] contamination and differentiate between controlled and heavy metals exposed fishes.

CORE TEAM



M. K. Dutta,
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*Publications from this Work:

1. M.Arora, Parthasarathi, M. K. Dutta, "A low-cost imaging framework for freshness evaluation from multifocal fish tissues" *Journal of Food Engineering, Elsevier Publishers, DOI: //doi.org/ 10.1016/j.jfoodeng.2021.110777, 2022, Impact factor : 6.203*
2. Anamika, Rakesh Joshi, M.K.Dutta, "Computer vision technique for freshness estimation from segmented eye of fish image" *Ecological Informatics, Elsevier Publishers, DOI:doi.org/10.1016/j.ecoinf.2022.101602, 2022, SCI indexed Impact Factor – 4.498*
3. Ashish Issac, Ashutosh Srivastava & M.K.Dutta, "An automated computer vision based preliminary study for the identification of a heavy metal (Hg) exposed fish - *Channa punctatus*" *Computers in Biology & Medicine, DOI: 10.1016/j.combiomed.2019.103326, 2019, Elsevier Publishers, Impact Factor – 6.698.*
4. Anushikha Singh, Ashutosh Srivastava, Rakesh Chandra Joshi & M.K.Dutta, "A Novel Pilot Study on Imaging based Identification of Fish Exposed to Heavy Metal (Hg) Contamination" *Journal: Journal of Food Processing and Preservation, Wiley Publishers, Article DOI: 10.1111/jfpp.15571, 2021, SCI Indexed Impact Factor : 2.609.*