



On board automatic identification and quantification of the total catch: the iObserver



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iSEAS

<http://lifeiseas.eu>

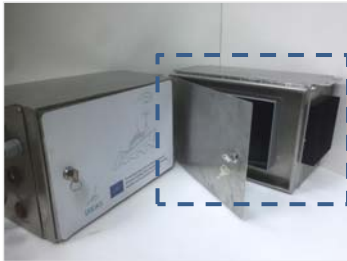


INTRODUCTION AND OBJECTIVE

- **Fish discards** constitute a **waste** of marine resources with **adverse** socio-economic and environmental **impacts**
- The **European Common Fisheries policy (CFP)** has been set up to:
 - Mitigate/prohibit discards [1]
 - Find alternative uses for unavoidable discarded biomass [2]
- **Innovative technologies** are required to monitor and quantify the level of compliance of the CFP [3]
- **Objective:** To develop an automated system for registering the whole catch: the **iObserver**
 - Located over the conveyor belt
 - User friendly GUI
 - Fish species recognition from pictures
 - Individual size/weight estimation
 - Real-Time transmission to in-land analysis center

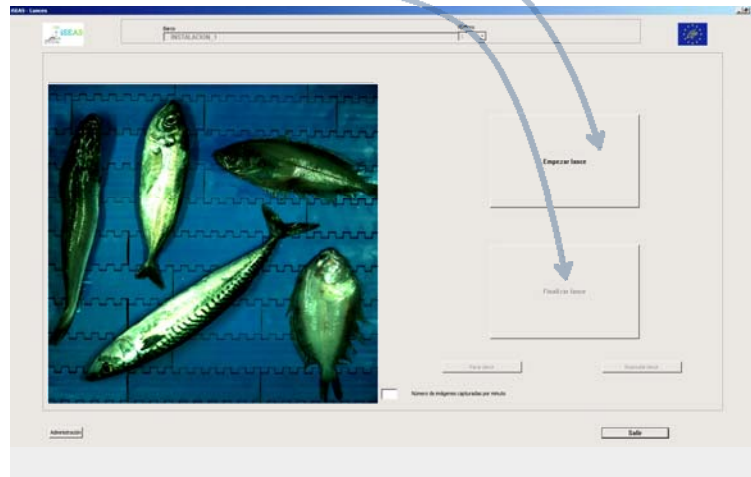
THE IOBSERVER

- **Hardware:** camera, computer, lights, protection case (18 kg)
- **Software:** different functionalities
 - Species **identification** from images
 - Identification automatically starts after pushing “start haul” button
 - Easy **training** of new species
 - **Calibration** for different lightning conditions



Main screen (easy to use – two buttons):

- Start haul
- End haul



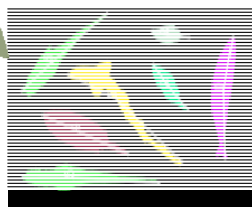
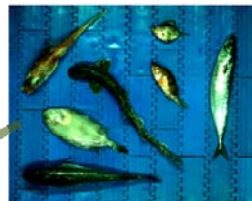
RESULTS AND DISCUSSION

Training of iObserver for recognition:

- Use of a **GUI**
- Different views (*dorsal, ventral, lateral*) for each species
- Several individuals per species (minimum 20)
- Up to 17 species were already trained

Recognition:

- Recognition based on color, texture and shape
- A CSV file with the identification results is generated
- Sensors in the belt to control camera/images acquisition
- Recognition accuracy up to 90% (non-overlapped)



Identification results comparison

Measured		Identified		Comparison	
Sp.	L [cm]	Sp.	L [cm]	Err L [%]	
GUX	21,5	GUX	21	✓	2,3
MAC	23	MAC	22,4	✓	2,6
HKE	26	HKE	24,8	✓	4,6
BOC	7	BOC	6,9	✓	1,4
SYC	28	SYC	26,4	✓	5,7
BRF	10,5	BRF	10,4	✓	1
MEG	17,5	MEG	17	✓	2,9

CONCLUSIONS

- **iObserver** provides highly accurate results with separated individuals. **Data** (csv file) is **transmitted** (in real time) to **in-land servers**
 - Entire **catch** can be fully **documented**
 - Ships can act as “on-line sensors”, getting real fishing activity information.
 - **Data** from ships can be used by fishing sector, scientists and policymakers to **decide the best fishing grounds**, to **assess the status of the stocks** or to **develop efficient regulations/laws**
- Currently working on:
 - Recognition improvement when individuals are overlapped
 - Shape recognition when texture/color is similar
 - Automatically start and finish the haul

REFERENCES

- [1] Sigurðardóttir, S. et al. (2015). *Marine Policy*, 51:366-374.
- [2] Ordóñez-Del Pazo, T., Antelo, L.T., Franco-Uría, A., Pérez-Martín, R.I., Sotelo, C.G., Alonso, A.A. (2014). *Trends Food Sci. Technol.*, 36 (1):29-43
- [3] Johnsen, J.P., Eliassen, S. (2011). *Marine Policy*, 35:130-139.

ACKNOWLEDGEMENTS

The authors thank the financial support received from the LIFE+ Program of the European Union (FAROS Project – LIFE08 ENV/E/000119 & LIFE iSEAS Project – LIFE13 ENV/ES/000131) and the intense work carried out by the different research groups belonging to LIFE iSEAS consortium:

