Jul 12th, 10:50 AM - 11:10 AM

Location, identification, and low complexity tracking algorithms with an image compression strategy for a long term multi-tracking application

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International Environmental Modelling and Software Society (iEMSs)
8th International Congress on Environmental Modelling and Software
Toulouse, France, Sabine Sauvage, José-Miguel Sánchez-Pérez, Andrea Rizzoli (Eds.)
http://www.iemss.org/society/index.php/iemss-2016-proceedings

Location, identification, and low complexity tracking algorithms with an image compression strategy for a long term multi-tracking application

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Abstract: A biological experiment that requires a continuous tracking of a group of 10 to 20 fish specimens was designed to obtain empirical data to estimate biological energy models from specimen's activity. The surface in which specimens can move is enormous (2,5m x 5m) in comparison to the sizes of the individuals and it is mandatory to work with high resolution images in order to cover all the area. Furthermore, as each experiment must work uninterruptedly during fifteen days the cost of storing and post-processing all the generated information in its rough form is prohibitive, incurring into a big data problem. The proposed approach deals with the need of implementing a real time processing and in this paper we present the computer vision algorithms used to locate and identify specimens and track them along the time series of images. Additionally, in order to verify all experiments, we have designed a compression strategy to save the relevant information of each frame that makes possible to store it in a sustainable way, but with the property that could be partially reversible, enabling to display back a reconstructed reproduction of the fishes' movements.

***Keywords**:* low complexity tracking; underwater computer vision; data compression

ACKNOWLEDGMENTS

This work has been possible with the IP cameras of Japoco Acuzzi and José Antonio García del Arco from the ICM-CSIC and has been supported by the Spanish Government project *PHENOFISH: El síndrome de la pesca: cambios multi-escala inducidos por las respuestas de los peces a la pesca. Soluciones tecnolgicas* with references: CTM2015-69126-2-R.