Automated Image Processing:
Marine Mammal Monitoring Prospects*

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Abstract

Airborne sensor and UAS advances are making airborne surveys of marine mammals more affordable. Thousands of maritime images may now be gathered in a single, un-piloted flight, launched from either ship or land. However, one critical component is lagging: the capacity to identify marine mammals from high resolution data, automatically. Without that capacity, human observers must analyze massive amounts of data manually. Analyzing images manually in real time runs the risk of missing target animals and distracting observers from other important tasks. Post-flight, manual analysis can cause expensive delays in marine mammal detection and mitigation. Either way, manual data analysis requires human intervention, takes time, and costs money. For example, a UAS may be configured with high resolution cameras to look for marine mammals in order to meet regulatory oil drilling or fishing requirements. Highly compressed video data may be streamed to the UAS operator in real time, allowing the operator to redirect the UAS for closer looks when marine mammals are found. However, identifying them in real time from compressed data can be difficult and distracting. Alternatively, trained experts may analyze high resolution images post-flight with better chances than real-time observers of finding marine mammals. But doing so can take time, cost money, and happen too late. In this presentation, automated marine mammal detection availability for post-flight marine mammal detection will be described and demonstrated. Its operational use, potential value, and key transition enablers will be discussed.

* Related material has been presented at the 2015 UAS Alaska conference, the 2015 Commercial UAV Expo conference, and elsewhere. Related products have been delivered by Brainlike to LGL Alaska Research Associates and Shell Oil. Thanks to LGL and Shell for their generous support and permission to demonstrate the use of their images presented in this report. Special thanks to Darren Ireland, Kathleen Leonard, and Heather Patterson from LGL, along with Gregory Schaefer, Grant Mercer, and Sherry Ge from Brainlike, who collaborated on related work.

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