

New fin-recognition technology a boon for global dolphin conservation

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'finFindR', is an R package that identifies wild dolphins using photographs of the nicks and notches on their dorsal fins. Credit: NMMF

The National Marine Mammal Foundation (NMMF) and Western EcoSystems Technology, Inc. (WEST) today announced the release of an innovative, automated system, 'finFindR', that identifies wild dolphins using photographs of the nicks and notches on their dorsal fins.

The free, opensource software application allows researchers to compare fin characteristics in their dolphin photographs with those in finFindR's catalog of known individuals. To promote dolphin conservation efforts across the globe, the application is being provided free of charge to those conducting dolphin photo-identification research.

Dolphins face many challenges in our oceans. They suffer negative effects from oil spills, can drown from entanglement in fishing gear or accidentally ingest marine litter, especially plastics. They are hit by boats and their propellers and are affected by marine mining and seismic surveys. Fish, their main diet, have also declined in many areas due to changing ocean temperatures and currents, and overfishing by humans.

"Our NMMF team feels strongly about protecting dolphins in our oceans," emphasized Dr. Cynthia Smith, NMMF Executive Director. "Identifying and

following individual animals is essential to researchers worldwide who study dolphins' survival and reproductive rates, population size, and other parameters important for effective conservation actions and finFindR will help them do that "

Dr. Lori Schwacke, NMMF Chief Scientist for Conservation Medicine, explained that her team used photo-identification to study dolphins affected in heavily oiled areas of the northern Gulf of Mexico following the Deepwater Horizon oil spill. "Each time we photographed a dolphin, we had to search through thousands of photos of known individuals to determine if it could be matched," Schwacke stated. "finFindR changes that. It saves researchers invaluable time and money, allowing us to significantly expand our studies of dolphin populations, and conduct those studies more quickly."

NMMF teamed with WEST to develop the automated fin matching application, which is loosely based on GoogleFace and recent advances in image recognition algorithms. Researchers no longer have to sort, match and discard unusable images by hand. Using the artificial intelligence methods upon which it is based, finFindR can sort a catalog of 10,000 images in a fraction of a second, a task that takes humans hours or even days.

The performance of finFindR is impressive. In two tests on photos of known-individuals, finFindR autonomously traced [dorsal fins](#) from photographs and identified the correct dolphin in 88% of all test cases. When asked to sort the catalog based on probability of a match, finFindR included the correct individual in the top 10 possible matches over 93% of the time.

Todd Speakman, NMMF Field Biologist, added, "Analyzing photos has always been the biggest bottleneck for dolphin photo-identification studies. finFindR will be a game changer for the time and cost required to conduct these studies.

Our hope is that by providing other researchers access to finFindR, new and more robust studies will be possible to better inform management and conservation efforts."

More information: Interested researchers can find the source code on the NMMF website at www.NMME.org or at github.com/haimeh/finFindR/wiki

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