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New SEE Shell Mobile Application Uses Machine Learning to Help Tackle the Illegal Tortoiseshell Trade

The application uses deep machine learning and photographic image recognition to discern whether or not a product is made from a hawksbill sea turtle's shell.

PORTLAND, Or, USA, March 30th, 2022 – Conservation nonprofit SEE Turtles has launched an innovative mobile application that will help address the illegal trade of hawksbill sea turtle shells. The beautiful shells of this critically endangered species, commonly referred to as "tortoiseshell," are used to create jewelry and ornamental souvenirs in many countries. The SEE Shell App employs machine learning to differentiate real and faux tortoiseshell products; it is the first mobile application to use artificial intelligence to combat the illegal wildlife trade. This novel technology will enable tourists, law enforcement, and wildlife officials to quickly identify products made of authentic tortoiseshell.

Despite international laws against the sale of tortoiseshell goods, the tortoiseshell trade is active in at least 40 countries, according to SEE Turtles 2020 "Global Tortoiseshell Trade" report, and it remains the primary threat to hawksbill sea turtles. With an estimated 15,000 to 25,000 adult female hawksbill turtles remaining in the wild, this groundbreaking mobile application will play a key role in bringing these animals back from the brink of extinction.

"One of the major roadblocks to eliminating the illegal tortoiseshell trade is the difficulty in distinguishing real from fake products, whether by a consumer or law enforcement officer," said Brad Nahill, President of SEE Turtles. "Because telling these products apart can be very difficult, retailers and shoppers often unwittingly contribute to the trade."

SEE Shell will help eliminate this confusion. This highly accurate application can now discern whether an item is made of real hawksbill shell or from faux tortoiseshell materials such as resin, horn, bone, seashells, or coconut shells with at least 94% accuracy by simply taking a photo. The mobile application utilizes deep learning technology that compares product photos taken by app users to a data library of more than 4,000 real and artificial tortoiseshell products. As images are stored in the catalog from locations around the globe, a clearer understanding of

the size and location of the illegal tortoiseshell trade will emerge. This evidence will inform where trade enforcement and hawksbill conservation is most needed.

"Thanks to our conservation partners around the world who have contributed tortoiseshell photos, we have created a first in the wildlife trafficking field; an app that can help individual consumers identify and avoid endangered animal products," said Alexander Robillard, Computer Vision Engineer with SEE Turtles and Predoctoral Fellow with the Smithsonian OCIO Data Science Lab and National Zoo.

SEE Turtles has also partnered with the World Wildlife Fund for Nature on the SEE Shell App, who is providing financial and technical support to help advance the application's data collection and documentation and to help promote and embed its use with government agencies and online retailers.

"SEE Shell will not only empower international travelers to do their part in reducing demand for tortoiseshell products, but for the first time, provide law enforcement officials with a tool they can use to identify these products for sale in markets, online, and when intercepted or confiscated at border crossings," said WWF Global Marine Turtle Conservation Lead, Christine Madden Hof.

A part of SEE Turtles' "Too Rare to Wear" campaign, partnering organizations in Indonesia and Latin America have helped to test the app in the field and will train local law enforcement officials on how to use the application to document the presence of tortoiseshell trade in their regions. Participating organizations include the Turtle Foundation (Indonesia), Fundación Tortugas del Mar (Colombia), Latin American Sea Turtles (Costa Rica), The Leatherback Project (Panama), and Sos Nicaragua.

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