

# CountrySide

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## Small wildlife of fields and meadows in Europe

Capercaillie

# Facial Recognition Provides Traceability for Cattle

*One hundred years ago, a new technology was about to change people's lives in unimaginable ways. In 1920, the electric light bulb was in use but all the other applications for electricity were just beginning. The electric fan, the electric toaster, and the electric washing machine were revolutionary ideas. These new applications of this technology called "electricity" changed the way people lived.*



Emmanuelle MIKOSZ, ELO

Today, the same can be said of the deep learning of artificial intelligence. It will change our lives. It gives us the ability to analyze and sort massive amounts of data by looking for extremely small differences in individuals using nanotechnology and biometrics. This is the basis of human facial recognition. It is an idea that has been around for nearly 40 years. Now, we are finding new applications for that same technology.

Joe HOAGLAND, founded a new breed of cattle 25 years ago and started the American Black Hereford Association. Now, he has developed a cellphone app to track the movements of cattle using facial recognition technology. It is called CattleTracs.

Photo analytics particularly lends itself to the deep machine learning of artificial intelligence. *"If you are considering going to medical school, don't become a radiologist because by the time you graduate, they will have a machine to do that"* HOAGLAND said. Artificial intelligence can perform that function and many more like it, such as more sophisticated crop management systems using satellite imagery.

Facial recognition based on AI works in two ways. First by locating key facial points it can produce a unique result using the angles and distances between other key points. Second it compares the local binary pattern



For each animal image (1st column), we find the nearest human neighbors in terms of pose. These human neighbors are used to train a warp network that warps an animal to have humanlike face shape.

of the pixels of that photograph. That is to say, it looks at each pixel in a photograph and compares it to the eight pixels around it to detect differences in texture. It also produces a unique result. In combination these two comparisons can identify people even if their image is partially occluded or as they grow older.

People want to know how we can identify cattle as they age, just from photographs. It will always be a question of the probability of a match that identifies an animal over

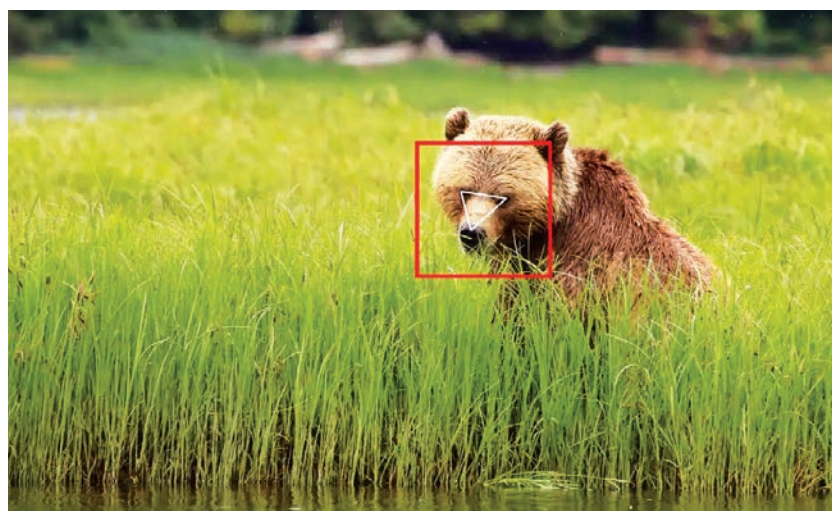
time. The confidence level of the algorithm will improve with practice thru the deep learning of artificial intelligence as the database collects images over time.

In human facial recognition, scientists have identified around 200 of these key facial points. The accuracy rates are near 100%. Interestingly the same type of key points can also be found in the faces of animals.

The technology works on animals just like it does on humans. However, to recognize



Joe HOAGLAND



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©CattleTracs

something you must have seen it before. In other words, that animal needs to have been entered into the database for there to be a match or a recognition that it is the same individual.

The science is called Biometrics. It is the measurement of unique angles and distances of key facial point features. It works the same way in animals. Just as Huawei's "Safe City" technology has been used to locate and track people of interest at subway stops and train stations, it has been used to identify and track bears by a California based company called BearID.

Locating these biometric key features is tedious work. In bears it took nearly two years to locate a dozen or so key features. Those have produced an identification confidence rate of nearly 85% in the grizzly bears studied.

After three years of research, Black Hereford Holdings, Inc. which was founded by Joe HOAGLAND, a member of the Countryside, has identified more than two dozen such biometric key identifiers for cattle. They have developed an algorithm for producers to use around the world to identify and track individual animals in the beef supply chain. "Knowing where our food comes from makes us healthier and safer than if we do not know" HOAGLAND said.

This new product is an inexpensive non-invasive way to use facial recognition technology to provide age and source verification for cattle. It uses a free cell phone app called CattleTracs.

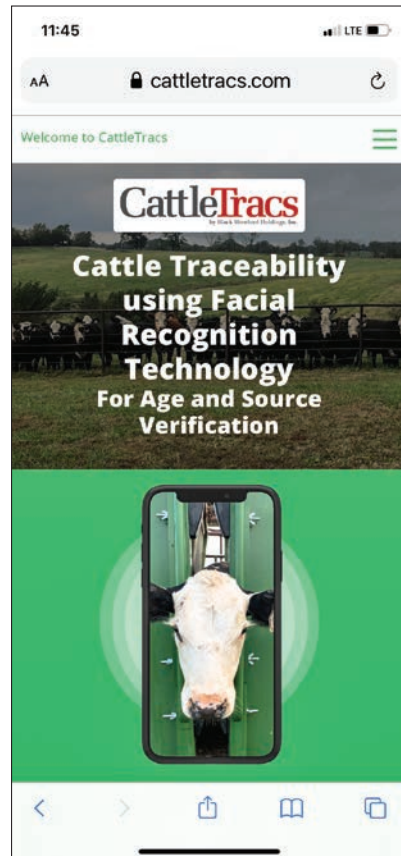
It activates the camera function in a cell-phone which will only photograph a bovine face. It takes that photo automatically when the phone is positioned at the correct angle and distance for facial recognition.

The image is then uploaded to a secure database with the date and GPS location. That information is stored in Blockchain so it cannot be altered but only added to when another image matches a previous photograph in the database. In that way, as an animal moves thru the beef supply chain it can be traced right up to the point of harvest.

Researchers at Kansas State University have collected images of over 1000 head of cattle to test the CattleTracs technology. Their proof-of-concept study found a 94% accuracy level. As with all facial recognition, the larger the database, the more robust the identification becomes. That is the wonder of artificial intelligence.

The cellphone app is free. Anyone can use it. There is no record of user information. CattleTracs just records cattle by their photograph taken at a certain place and at a certain time. Just download it from an App

Store near you. Visit [www.cattletracs.com](http://www.cattletracs.com) for details to download the app. Age and source verification will reward producers for the quality of their product. In the event of a disease outbreak in cattle similar to African Swine Flu in the pork industry, the traceability this app provides will make our food supply chain safer and healthier for all of us.



  
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