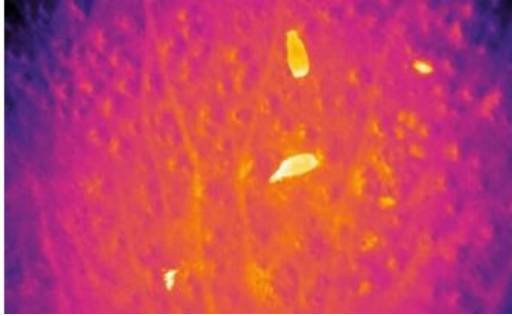


UAVs and Software Help Prevent Poaching



As the world soberly reflects on the death of the last male northern white rhinoceros, astrophysicists and ecologists at Liverpool John Moores University (LJMU) have collaborated on a new project that could stop poaching in its tracks.

The project is based around machine-learning algorithms and astronomical detection tools developed through the open source software, Astropy. Astrophysical software and techniques are applied to thermal infrared imagery captured by drones to automatically detect and identify animals — crucially, this is just as effective at night — when most poaching activity occurs.

The project was presented publicly for the first time at the European Week of Astronomy and Space Science (EWASS) in Liverpool. The team at LJMU worked with Knowsley Safari and Chester Zoo to amass libraries of imagery to train the software to recognise different animal species in a range of landscape and vegetation, before embarking on field tests with endangered species in the wild.

“We held our first field trial in South Africa last September to detect Riverine rabbits, one of the most endangered species of mammal in the world. The rabbits are very small, so we flew the drone quite low to the ground at a height of 20 metres. Although this limited the area we could cover with the drone, we managed five sightings. Given that there have only been about 1,000 sightings of Riverine rabbits by anyone in total, it was a real success,” said Claire Burke, spokesperson for the project.

The team developed software that models the effects of vegetation blocking body heat, allowing the detection of animals concealed by trees or leaves. The system is now being refined and upgraded to compensate for atmospheric effects, weather and other environmental factors.

“With thermal infrared cameras, we can easily see animals as a result of their body heat, day or night, and even when they are camouflaged in their natural environment. Since animals and humans in thermal footage ‘glow’ in the same way as stars and galaxies in space, we have been able to combine the technical expertise of astronomers with the conservation knowledge of ecologists to develop a system to find the animals or poachers automatically,” added Burke

“Our aim is to make a system that is easy for conservationists and game wardens to use anywhere in the world, which will allow endangered animals to be tracked, found and monitored easily and poaching to be stopped before it happens.” concluded Burke.

In May, the project will focus on orangutans in Malaysia, followed by spider monkeys in Mexico, and a search for river dolphins in Brazil in June 2018.