A Meerkat that prevents poaching in the Kruger Park

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South Africa, with its abundant wildlife, suffers from a scourge of poaching that has become a significant challenge in the country's national parks. In particular, the poaching of rhinos for their horns has increased dramatically since 2014, so SA National Parks (SANParks) sought out a system that could enable it to successfully counter this: one that could detect movement – specifically of people – in protected areas.

According to Charl Petzer, programme manager for integrated security at the Council for Scientific and Industrial Research (CSIR), such crimes can only occur if there is a target, a willing perpetrator and no active guardian, so the CSIR has developed a

system to protect the target, identify the perpetrator and direct the guardians to the right place.

“To this end, we have developed the Meerkat Wide Area Surveillance System (WASS), which allows SANParks to detect and track poachers over a distance of many kilometres. The system uses a locally developed radar from Reutech Radar Systems to detect poachers day and night, over a wide area, while custom developed long-range optics are used to inspect suspicious movement,” he explains.

Andre le Roux, radar business development manager at the CSIR, adds that unlike something like a smart fence that may be used on a farm to detect unauthorised entry via sensors, the Kruger National Park (KNP) is a vast area to try protect in such a manner.

“The challenge with such an approach would be that even if a sensor was triggered, because of the vast distances, by the time the rangers arrived, the likelihood of the poachers having moved some distance away is great.

“However, Meerkat enables an area defence, as opposed to an electronic ‘line’ that is crossed. Thus the radar can detect movement over a wide area in real-time, and an experienced operator is generally able to tell the difference between a human and an animal. Thus, if an anomaly is picked up, the long-range cameras can be used to identify exactly what it is.”

Petzer notes that the system is fully operational, with the initial one being deployed in an experimental stage in 2017. Since then, it has been further developed while in use, with the improvements undertaken making the system extremely effective today.

“In fact, the experimental system had only been operational for two nights when it helped rangers to apprehend a group of poachers. Over the period since then, the poachers themselves seem to have recognised that certain areas of the park have a system they don’t quite understand that is enabling the authorities to catch them.”

“The system has been so effective – around 95% of the poachers entering the Meerkat deployment zone have been detected – that most seem to now simply avoid those areas. And the beauty of this is that it has been like placing a glass dome over our rhinos. Moreover, the Meerkat is re-deployable, so if the rhinos move to another part of the park, the system can also be shifted there, or even to a different park, should this be required.”

Petzer points out that the system can have additional uses, beyond apprehending the bad guys. For example, it could be used for tracking and understanding animal movements and migration patterns, benefits that have certainly excited many of the KNP’s rangers.

Le Roux suggests that Meerkat offers other potential uses too, beyond its work at SANParks. From securing large industrial areas to open cast mines, there are many other industries where this technology can be applied.

“It is worth noting that whatever sector this technology is used in, it only works effectively as part of a bigger system. In the KNP, Meerkat identifies the poachers and where they are, and can track their movements, but it can’t apprehend them. Without the rangers doing the hard work on the ground, the system would not succeed. The benefit of Meerkat is that it enables the rangers to be proactive, enabling them to intercept and arrest the poachers before they even reach the rhino herd.

“We like to refer to this as a force multiplier system. This is because without Meerkat, the rangers would require far more boots on the ground. Instead, this system can direct them to the exact place they need to be, meaning that the KNP is also able to derive more value from its existing manpower, so it essentially multiplies their capabilities,” he concludes.