

AI for Earth Grantee Profile

Peace Parks Foundation

Master tracker app

Summary

Traditional animal tracking skills offer value to modern needs for conservation, wildlife protection, and eco-tourism. However, these skills are in danger of being lost. Peace Parks Foundation has been involved with the SA College for Tourism's Tracker Academy for several years. The Tracker Academy seeks to restore these skills, and now bring them into the modern age with a custom app that helps students learn to track, while also teaching the general populace the value of tracking.

Perpetuating the traditional skills of animal tracking

Animal tracking is an ancient set of skills practiced by people in many rural communities around the world, such as the Kalahari, Mpumalanga, and Limpopo lowveld in southern Africa.

Often lacking advanced tracking skills, modern trackers are poorly compensated for their work and overlooked as a potentially valuable resource.

These skills include not just identifying and following animal footprints, but also recognizing the animals' calls, other physical signs and behavior, and knowing how to interpret all this information. Traditionally for hunting and survival, tracking skills may also be effectively utilized in environmental monitoring and wildlife protection, as well as eco-tourism.

However, mystical qualities are often ascribed to the highly skilled master trackers, reinforcing a misconception that their skills are innate talents that can't be taught. This misconception limits the passing of these skills to new practitioners, particularly as few academic institutions recognize and teach tracking as a formal profession. As cultures and lifestyles change due to modernization and urbanization, these traditional skills are being lost over generations. Without formally recognized qualifications and often lacking advanced tracking skills, modern trackers are poorly compensated for their work, and wildlife agencies often overlook them as a valuable resource.

Working to preserve those skills and change that perspective is the mission of the [Tracker Academy](#), a training division of the [SA College for Tourism](#) (SACT)—a college that operates under the auspices of the [Peace Parks Foundation](#) (PPF). Based in Stellenbosch, South Africa, PPF was founded with the goal of facilitating cross-border conservation efforts throughout southern Africa. SACT was founded in 2001 to provide professional training to primarily unemployed women from impoverished rural backgrounds, to equip them to take up skilled positions in the nature-based tourism industry. In 2010, the Tracker Academy was added, helping students become ambassadors for and custodians of Africa's wildlife by bringing authenticity and accuracy to environmental education, wildlife protection, eco-tourism, monitoring, and research.

Merging ancient art with modern technology

Although the purpose of the Tracker Academy is to restore indigenous knowledge of tracking skills, it shares a vision with PPF of realizing the role of modern technology in meeting that goal. Building from past work that involved collecting and cataloguing various animal signs and tracks, PPF and Alex van den Heever, the general manager of Tracker Academy, are developing a master tracker mobile application that uses artificial intelligence (AI) to help teach students. Just the very act of developing the app provides opportunities for the students to learn. Later, this information and knowledge will be used to impart knowledge to citizen scientists.

In 2018, Microsoft Philanthropies awarded PPF a grant to support its move to the cloud, while Microsoft AI for Earth awarded the foundation three grants to support various aspects of their work, including the master tracker application. The AI for Earth grant provides PPF with access to Microsoft cloud and AI tools to accelerate its work to promote conservation efforts.

The first phase of this project is to build a machine learning algorithm that can identify the different signs (spoor) of animals. The team is loading Alex van den Heever's existing vast library of images into Microsoft Azure and using them to start training the machine to identify the various species and qualities such as sex and age by analyzing the spoor.

Tagging images to train the machine learning model helps student trackers learn about tracking and increases computer and literacy skills.

To do this training, a substantial number of the images need to be tagged to mark the footprints and other signs in predefined ways, which Alex and a team of trackers are doing through a simple web app. Not only does this reinforce the lessons that the student trackers learn about tracking, but it helps increase the computer and literacy skills of the trainers and trackers. When the students are out in the veldt, they'll also be

taking their own photographs to document the identification processes they're being taught, and these will be tagged and loaded as well.

An important aspect of the master tracker app development is the establishment of a cloud-based centralized environment. The Microsoft grants are enabling PPF to move infrastructure to the cloud, where large volumes of data collected by various sensors will be aggregated, analyzed, and autonomously interrogated using customized Azure Cognitive Services.

Moving forward

As a comprehensive digital library of animal tracks is built, the Azure machine learning model will eventually be able to use image recognition to accurately identify the images for itself, rather than requiring the tags. At that stage, the second phase of the project can happen: building the master tracker mobile app that can be used out in the field, not just by the student trackers but by citizen scientists and the general public. The goal is to work toward users being able to photograph animal spoor with their mobile devices and the app will identify the likely species from the images. For Tracker Academy students, the app will help them collect, collate, and report on their training field observations. For other people such as tourists, the app will serve as a reference tool to help them learn more about animal tracking and key species, and provide enjoyment through collecting and contributing this knowledge. This will enable a citizen-science approach toward developing a wider public awareness of the skills and value of traditional trackers as well as the value of wildlife conservation.

About Peace Parks

Peace Parks Foundation (PPF) has been involved in establishing and managing transboundary conservation areas in southern Africa for over two decades. PPF's dream is to reconnect Africa's wild spaces—re-establishing, renewing, and preserving large functional ecosystems—to create a future for man in harmony with nature. PPF has been actively involved in establishing and developing 10 of the 18 transboundary conservation areas in southern Africa, called peace parks, and also provides strategic planning assistance to governments and other agencies in support of the parks, which combined cover roughly one million square kilometers.

Resources

Websites

[Peace Parks Foundation](#)
[Tracker Academy](#)
[AI for Earth](#)